E-Catalog Version 7.0

Release Date: 12-12-2009

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Bio Technology Products &

Manufacturer of DNA-RNA Intermediates

New Products

- Natural RNA Phosphoramidites : Bulk Quantities
- Modified RNA Phosphoramidites : Bulk Quantities
- 2'-O-Methyl nucleosides and phosphoramidites for Natural & Modified DNA and RNA
- RNA Synthesis in Reverse Direction
- TOM Amidites for RNA synthesis : Bulk Quantities
- Non-Cleavable Inert Supports for high quality oligo synthesis, combinatorial libraries, chip design, etc.
- 5-Ethylthio tetrazole (ETT) & 5-benzylthio tetrazole (BTT) -Bulk Quantities
- DDTT Sulfurizing Reagent
- UnyLinker Universal Support
- Akta Oligonucleotide Synthesizer Reagents
- N-Alkylated nucleosides and phosphoramidites for mutagenesis studies & reversal of mutation
- 5-Azacytidine and 5-Aza-2'-deoxycytidine nucleosides: key anticancer nucleosides
- 4-Thio & 2-thio uridines; deoxy uridines and 2-thio thymidines as nucleosides and phosphoramidites for incorporation in DNA and RNA
- 6-FAM NHS Ester & 5-FAM NHS Ester
- 6-FAM & 5-FAM-(C-6 linker) amidites and 6-FAM-dU-(C-5 linker)- phosphoramidite
- Biotin (BB)-(urea nitrogen protected)-phosphoramidites and Supports
- Biotin (BB)-dU-(C-5)-phosphoramidite
- Polyethylene glycols (PEG) (MW. 2000 and 4500) phosphoramidites
- 5'-MMT nucleoside phosphoramidites (Purines: A & G)
- 8-Methyl dG & 8 Methyl rG phosphoramidites
- 8-Oxo dA & dG phosphoramidites
- 5'-O-Methyl DNA Amidites
- Fmoc Protected Nucleoside phosphoramidites
- 5-Formyl dU phosphoramidites
- Ammonia Free Deprotection Reagents for Sensitive DNA/RNA and Oxalyl CPGs
- DNA Purification kit
- RNA Purification kit

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Experience Nucleic Acid Expertise

Since 1981, the products and services provided by ChemGenes Corporation continue to accelerate the pace of DNA/RNA oligonucleotide synthesis, research, and development in the pharmaceutical and biotechnology industry.

Extensive Product Lines:

DNA-RNA Phosphoramidites
DNA-RNA Solid Supports
2'-O-Methyl RNA Amidites & Supports
ß-L-DNA & ß-L-RNA
7-Deaza Products
Deoxy & Ribo Nucleosides, protected
Dimers
Triphosphates
Ancillary Reagents for Oligonucleotide Synthesis
and much more...

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Background

ChemGenes Corporation, a biotechnology company located in Wilmington, Massachusetts, has been a strong partner to researchers engaged in the field of DNA/RNA synthesis for more than 20 years. By starting out as a supplier of 'Ultra Pure Products' and then also by becoming an active Contract Researcher, ChemGenes Corporation has achieved unparalleled expertise in the field of DNA/RNA synthesis. Thus, all of us at ChemGenes have the opportunity and great pleasure to serve a vast number of scientists in the US and all over the world.

ChemGenes holds a number of patents in the field of standard, modified, as well as backbone modified DNA/RNA synthesis products. ChemGenes has a worldwide licensing agreement on US patent No.s 4,415,732 and 4,458,066, pioneering patents on the discovery of DNA and RNA synthesis by Caruthers and Beaucage. We have another worldwide licensing agreement on US patent No. Re 34,069, the presently popular cyanoethyl (CEP) phosphoramidite version for DNA and RNA synthesis.

ChemGenes' product lines include phosphoramidites for DNA and RNA synthesis, Antisense phosphoramidites, modified bases for DNA, as well as RNA modification. In addition, we produce a variety of modified phosphoramidites for the introduction of chromophores and ligands. The availability of prepacked disposable columns of various pore sizes, loadings, low volume columns, ancillary reagents in configurations suitable for each synthesizer, and DNA purification cartridges is another way ChemGenes meets its customers' needs.

ChemGenes has a strong, dedicated, and talented team of professionals for the manufacturing of many natural and modified nucleoside bases. Included in these natural and modified bases are DMT protected deoxy and ribo nucleosides, 2'-O-methyl and 2'-O-propargyl nucleosides, and silyl protected ribonucleosides.

A large variety of reagents for the synthesis of DNA/RNA are also available. These include 5-thioethyltetrazole, benzylthiotetrazole, DMT-chloride, MMT-chloride, and several types of phosphorylating reagents such as cyanoethyl chloro phosphitylating reagent, cyanoethyl tetra isopropyl phosphitylating reagent, cyanoethyl dichloro phosphitylating reagent and 5', 3'-bis silylating reagent.

As the market for oligonucleotides continues to grow, ChemGenes will stay committed to introducing novel products, while maintaining its existing product mix. We also have the capacity to custom synthesize products on request. Our highly trained technical staff is always available and happy to help you with your special needs and demands in this area. For information regarding the full range of products and their applications, please call us at 978-694-4500 or toll-free 800-762-9323, fax: 978-694-4502, or e-mail: info@chemgenes.com

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Special Gratitude

The nucleoside phosphoramidites available in this catalog are the result of the classical research contribution by Professor M.H. Caruthers and colleagues (University of Colorado, Boulder, CO) (S.L. Beaucage and M.H. Caruthers, Tet. Letters, 22,1859-1862, 1981). Other enormous contributions in this field have been made by Professor K.K. Ogilvie and colleagues (Acadia University, Arcadia, Canada), Professor R.L. Letsinger and colleagues (Northwestern University, Evanston, IL), and Professor H. G. Khorana, Noble Laureate and colleagues (Massachusetts Institute of Technology, Cambridge, MA).

Licensing & Trademarks

ChemGenes 2' O-Methyl p-ethoxy patent #6,015,886
ChemGenes 2'-O-Methyl patent, patent #5,525,719,
ChemGenes 3'-O-Methyl patent #5,525,719
ChemGenes 2'-propargyl modified patent #5,744,595
ChemGenes 3'-propargyl modified Amidites & Solid Supports patent#5,744,595
Qiagen Inc. TOM Amidites Patent #5,986,084

*UNYLINKER™ is a Trademark of Isis Pharmaceuticals, Inc. The above products are covered under Isis patent #7,202,264. and ChemGenes Corp. holds world wide marketing rights

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Tools for Molecular Biology Research

Oligo Synthesis Reagents

Natural DNA Amidites & Supports

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Ordering Information

Quality:

ChemGenes Corporation products are manufactured under carefully controlled conditions and whenever applicable are constantly analyzed by Ultra Violet (UV) Spectroscopy. Thin Layer Chromatography, Electrophoresis, High Performance Liquid Chromatography (HPLC), Enzymatic, and Sequential Analysis. A product analysis report is enclosed with each shipment of our products.

Conditions for Sales:

ChemGenes Corporation products are sold for laboratory and manufacturing use only. Our products are not for use in humans for drugs or clinical diagnostics. Liability for any loss or damage which may arise from the sale, storage, use, and handling of these products is solely the responsibility of the user of purchase. ChemGenes Corporation does not assume any responsibility for patent infringement which may occur with the use of these products.

Our products are of highest purity and conform to the pertinent technical data sheet enclosed with each product. However, should any of our products fail to meet the enclosed data, ChemGenes Corporation will replace the products free of charge.

Any damage, due to thawing and breakage in transit, must be reported in less than five days. Any quality related problems, which do not conform to the technical data sheet, must be reported in less than thirty days. No return authorization or credit will be allowed after thirty days. All products returned need proper authorization from us.

The information supplied in this catalog is correct to the best of our knowledge.

Errors:

ChemGenes Corporation shall not be liable for any errors of clerical nature in prices or statements contained in our catalog, product literature, labels, and product data sheet. All errors are subject to correction.

OUR COMMITMENT TO YOU:
THE MOST COMPETITIVE PRICES
& HIGHEST QUALITY

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Please include the following information with each order:

- Our catalog number.
- Product name.
- Quantity.
- Your purchase order number.
- Shipping and billing address.

Quotations for quantities in excess of those listed in our catalog will be supplied upon request.

Delivery:

Orders for the products listed in our catalog will be filled promptly from our stock. When complete shipments can not be made, partial shipments will be made at our discretion.

All products are shipped freight paid with ChemGenes Corporation reserving the right to choose the best possible shipping method.

Shipping dates provided by ChemGenes Corporation are given on the basis of the best available information on hand. However, ChemGenes Corporation shall not be liable for any loss, damage, expense (consequential or otherwise) incurred by the buyer if ChemGenes Corporation fails to meet specified delivery.

Title of Products & Shipment:

The title of goods and products sold hereunder shall pass to the buyer upon delivery of products to the carrier.

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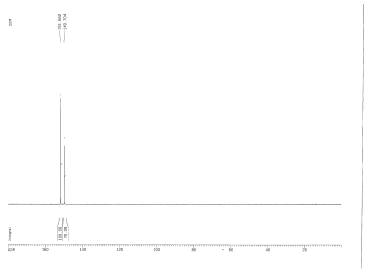
Oligo Synthesis Products

Phosphoramidites and Supports for Natural DNA Synthesis

Quality Control Criteria for UltraPure DNA Phosphoramidites

^{31}P NMR

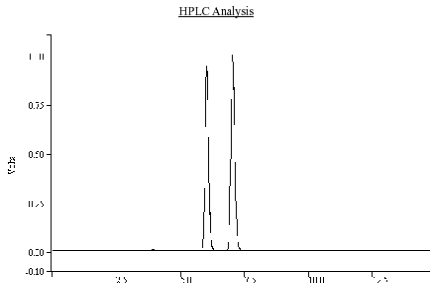
- Single or double peak
- Detection Limit: 0.08%



^{31}P NMR of a DNA Phosphoramidite

HPLC

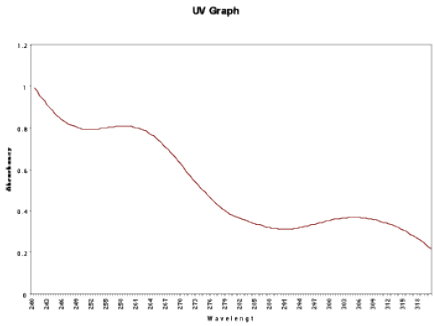
- Single or double peak
- Detection limit: 0.2%



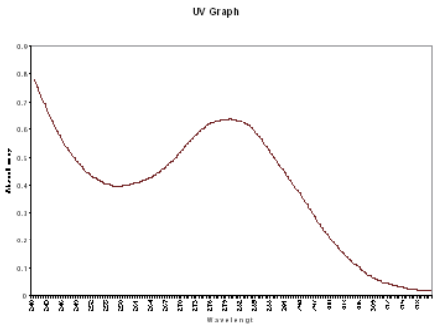
HPLC Graph of deoxy Guanosine (*N*-iBu) CEP

UV Characterization

- Used to characterize the purine or pyrimidine structure and substituent



UV Spectrum of dC (*N*-Bz) CEP



UV Spectrum of dA (*N*-Bz) CEP

Solubility Test

- 200 mg of pure dry product in 1.0 ml of dry acetonitrile (H_2O Content < 0.004-0.005 gm / 100 ml)

Coupling Test

- Greater than 99% under set conditions specified in the data sheet supplied with compound.

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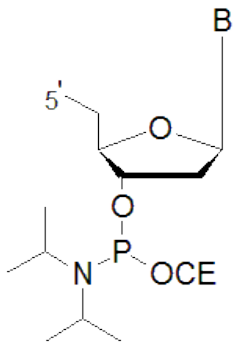
Phosphoramidites and Supports for Natural DNA Synthesis



Amidites for Natural DNA Synthesis with Standard Base Protection

5'	B	Protection	Catalog#
O-DMT	A	*N*-Bz	ANP-5551
O-DMT	C	*N*-Bz	ANP-5552
O-DMT	G	*N*-iBu	ANP-5553
O-DMT	T	n/a	ANP-5554
O-DMT	C	*N*-iBu	ANP-5559
O-DMT	C	*N*-Ac	ANP-5560
O-MMT	A	*N*-Bz	ANP-5556
O-MMT	G	*N*-iBu	ANP-5557

Catalog #	Product Name	250mg	500mg	1gm	2gm	5gm	10gm	30gm
ANP-5551	deoxy Adenosine (*N*-Bz) 3'-CEP, *M.W. 857.92*	$11	$22	$40	$65	$145	$270	$ 750
ANP-5552	deoxy Cytidine (*N*-Bz) 3'-CEP, *M.W. 833.89*	$11	$22	$40	$65	$145	$270	$ 750
ANP-5553	deoxy Guanosine (*N*-iBu) 3'-CEP, *M.W. 839.90*	$11	$22	$40	$65	$145	$270	$ 750
ANP-5554	Thymidine CEP , *M.W. 744.81*	$11	$22	$40	$65	$145	$270	$ 750
ANP-5559	deoxy Cytidine (*N*-iBu) 3'-CEP, *M.W. 799.89*	$14	$26	$40	$65	$145	$270	$ 750
ANP-5560	deoxy Cytidine (*N*-Ac) 3'-CEP, *M.W. 771.84*	$14	$26	$40	$65	$145	$270	$ 750
ANP-5556	MMT-deoxy Adenosine (N-Bz) 3'-CEP, *M.W. 827.91*	$15	$28	$54	$95	$210	$375	$1,010
ANP-5557	MMT-deoxy Guanosine (*N*-iBu) 3'-CEP, *M.W. 809.89*	$15	$28	$54	$95	$210	$375	$1,010

Mixed Bases (Equimolar)

(Deoxy Adenosine, Deoxy Cytidine, Deoxy Guanosine, and Thymidine)

Catalog #	Quantity	Prices
ANP-1070	250mg	$ 18
	500mg	$ 34
	1gm	$ 60
	2gm	$105

Typical Deprotection Conditions

- 45 minutes at R.T. for cleavage of oligo from support with concentrated ammonium hydroxide.
- Cleavage of base protection can be accomplished by either:
  - using concentrated ammonium hydroxide at 37°C for 16-24 hours, or
  - using concentrated ammonium hydroxide at 55°C for 6-8 hours.

(time ranges are dependant on the oligo chain length)

for faster deprotection conditions please see pages 5 & 7

Advantages and application of 5' -MMT in Purine Bases for Oligo Synthesis

Due to the use of 5-ethylthiotetrazole (in most DNA/RNA Synthesis protocols), which is more acidic in nature compared to 1-H Tetrazole, the DMT group from purine bases is removed to a certain extent in the coupling step during oligo synthesis, thereby causing undersired M+1 oligo growth.

Since purine bases, A & G, cleave at the 5'-DMT at a much higher rate than 5'-MMT, the 5'-MMT protected nucleoside phosphoramidites is preferred; thus, offering a minimal level of M+1 impurities.

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Oligo Synthesis Products

Phosphoramidites and Supports for Natural DNA Synthesis

Solid Supports & Columns

CPG's have a C-17 spacer (lcaa) between the succinate and Silyl group on the CPG supports. The long chain spacer arm is ≈ 18 Å long. The longer arm facilitates the synthesis of longer oligomers, where steric effects and surface repulsions are problems. The drop in coupling yield during the attachment of 1st and 2nd phosphoramidite is minimal and thus the formation of N-1 chain is negligible.

We are proud that the ChemGenes CPG Supports have out performed equivalent products available on the market. All the functional groups available on the derivatized CPGs have been carefully blocked to minimize possibilities of side reactions. CPGs are available in three pore diameters and each have been functionalized in three different loading levels.

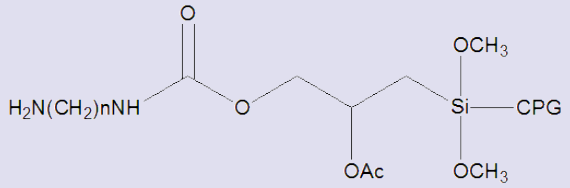
Amino CPG Long Chain Alkyl (lcaa) Support

The particle sizes for CPG's available at ChemGenes are: 80-200 mesh, 80-120 mesh, and 120-200 mesh. However the most common is 120-200 mesh and is used to derivatize our listed CPG's. Please enquire about the other two mesh sizes, which are available on a custom basis.

Selection Chart of lcaa CPG Supports for optimum oligo chain length

Trityl Value Codes	Synthesis Scales	Loading (µm/gm)	Recommended Pore Size	Oligo Chain Length (mer)
VL: Very Low	0.05 µm	5-6	2000Å	150-175
L: Low	0.2 µm	15-16	1000Å or 2000Å	61-100
M: Medium	0.2 µm	35	500Å and 1000Å	30 and 60
H: High	1.0 µm	90	500Å	< 30

Amino lcaa CPG Supports



Catalog#	Pricing	Catalog#	Pricing
N-5100-05	$ 40.00 / 1 gm	N-5100-10	$ 40.00 / 1 gm
	$ 65.00 / 5 gm		$ 65.00 / 5 gm
	$105.00 / 10 gm		$105.00 / 10 gm
Pore Size: 500Å		Pore Size: 1000Å	

* n; ChemGenes Corp. uses and sells native amino lcaa CPG with linker length 12 -16 ;

Empty Columns

Catalog#	Product Name	Synthesizer	0.2µm	1.0 µm	10 µm	15 µm
E-1007-05-ABI30	Empty Synthesis Columns & Aluminium Caps	ABI	n/a	$12	$40	$50
E-1007-05-ABI39	Empty Synthesis Columns & Aluminium Caps	ABI 3900	n/a	$12	$40	$50
E-1007-05-EX	Empty Synthesis Columns & Aluminium Caps	Expedite	n/a	$12	$40	$50
E-1007-05-LY	Empty Synthesis Columns & Aluminium Caps	Polyplex	n/a	$12	n/a	n/a
E-1007-05-MR	Empty Synthesis Columns & Aluminium Caps	MerMade	$12	$12	n/a	n/a

Replacement Filters

Catalog #	Quantity	Prices
EPC-1008	100	$50.00

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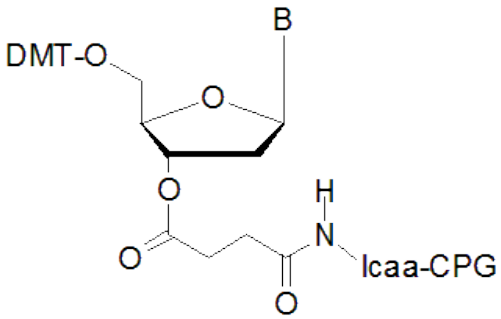
Phosphoramidites and Supports for Natural DNA Synthesis



Solid Supports for Natural DNA Synthesis with Standard Base Protection

5'	B	Protection	Catalog #
O-DMT	A	*N*-Bz	N-5101
O-DMT	C	*N*-Bz	N-5102
O-DMT	G	*N*-iBu	N-5103
O-DMT	T	n/a	N-5104
O-DMT	C	*N*-iBu	N-5112
O-DMT	C	*N*-Ac	N-5212
O-DMT	G	*N,N*-DMF	N-9898

			Bulk CPG			pack of 4 cols.			each		pack of 10 cols.		
Catalog #	Product Name	Pore Size	100 mg	1 gm	5 gm	40 nmole	0.2 µmole	1.0 µmole	10 µmole	15 µmole	40 nmole	0.2 µmole	1.0 µmole
N-5101-05 N-5101-10 N-5101-20	deoxy Adenosine (*N*-Bz) 3'-lcaa CPG	500Å 1000Å 2000Å	$8	$65	$280	$26	$32	$40	$85	$120	$52	$64	$80
N-5102-05 N-5102-10 N-5102-20	deoxy Cytidine (*N*-Bz) 3'-lcaa CPG	500Å 1000Å 2000Å	$8	$65	$280	$26	$32	$40	$85	$120	$52	$64	$80
N-5103-05 N-5103-10 N-5103-20	deoxy Guanosine (*N*-iBu) 3'-lcaa CPG	500Å 1000Å 2000Å	$8	$65	$280	$26	$32	$40	$85	$120	$52	$64	$80
N-5104-05 N-5104-10 N-5104-20	Thymidine 3'-lcaa CPG	500Å 1000Å 2000Å	$8	$65	$280	$26	$32	$40	$85	$120	$52	$64	$80
N-5112-05 N-5112-10 N-5112-20	deoxy Cytidine (*N*-iBu) 3'-lcaa CPG	500Å 1000Å 2000Å	$8	$65	$280	$26	$32	$40	$85	$120	$52	$64	$80
N-5212-05 N-5212-10 N-5212-20	deoxy Cytidine (*N*-Ac) 3'-lcaa CPG	500Å 1000Å 2000Å	$8	$65	$280	$26	$32	$40	$85	$120	$52	$64	$80
N-9898-05 N-9898-10 N-9898-20	deoxy Guanosine (*N,N*-DMF) 3'-lcaa CPG	500Å 1000Å 2000Å	$8	$65	$280	$26	$32	$40	$85	$120	$52	$64	$80

Please Indicate Synthesizer when Ordering

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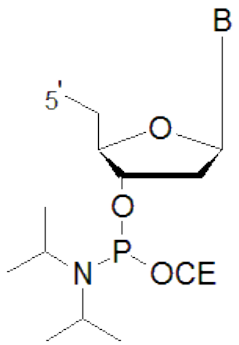
Oligo Synthesis Products

Phosphoramidites and Supports for Natural DNA Synthesis



Amidites for Natural DNA Synthesis with Labile Base Protection

5'	B	Protection	Catalog#
O-DMT	A	*N*-PAC	ANP-6661
O-DMT	A	*N,N*-DMA	ANP-6565 NEW!
O-DMT	C	*N*-PAC	ANP-6662
O-DMT	G	n-tBPAC	ANP-5668
O-DMT	T	n/a	ANP-5554
O-DMT	G	*N,N*-DMF	ANP-6769
O-MMT	A	*N*-PAC	ANP-5116
O-MMT	G	n-tBPAC	ANP-5117

Catalog #	Product name	250mg	500mg	1gm	2gm	5gm	10gm
ANP-6661	deoxy Adenosine (*N*-PAC) 3'-CEP, *M.W. 887.96*	$22	$40	$65	$135	$210	$375
ANP-6565 NEW!	deoxy Adenosine (N6-dimethylacetamidine) 3'-CEP, *M.W. 822.93*	$22	$40	$65	$115	$210	$375
ANP-6662	deoxy Cytidine (*N*-PAC) 3'-CEP, *M.W. 863.93*	$22	$40	$65	$135	$210	$375
ANP-5668	deoxy Guanosine (n-tBPAC) 3'-CEP, *M.W. 960.06*	$22	$40	$65	$135	$210	$375
ANP-5554	Thymidine 3'-CEP, *M.W. 744.81*	$11	$21	$40	$65	$145	$270
ANP-6769	deoxy Guanosine (*N,N*-DMF) 3'-CEP, *M.W. 824.90*	$22	$40	$65	$135	$210	$375
ANP-5116	MMT-deoxy Adenosine (*N*-PAC) 3'-CEP, *M.W. 857.93*	$25	$48	$72	$115	$230	$410
ANP-5117	MMT-deoxy Guanosine (n-tBPAC) 3'-CEP, *M.W. 930.04*	$25	$48	$72	$115	$230	$410

Typical Deprotection Conditions

- 45 minutes at R.T. for cleavage of oligo from support with concentrated ammonium hydroxide.
- Cleavage of base protection can be accomplished by either:
  - using concentrated ammonium hydroxide at 37°C for 6-8 hours, or
  - using concentrated ammonium hydroxide at 55°C for 2-4 hours.

  (time ranges are dependant on the oligo chain length)

For faster deprotection conditions please see page 7

For Ammonia Free Oligo Deprotection Solution (Catalog #: RN-1435) that can be used with the products on this page and the following page, please see page #103.

The capping reagent phenoxy acetic anhydride is available for capping during oligonucleotide synthesis, please see pages 17-23.

For a description of the advantages of using 5'-MMT nucleoside phosphoramidities, please see page # 2.

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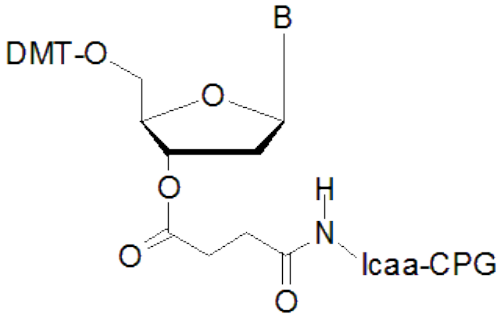
Phosphoramidites and Supports for Natural DNA Synthesis



Solid Supports for Natural DNA Synthesis with Labile Base Protection

5'	B	Protection	Catalog #
O-DMT	A	*N*-PAC	N-P5101
O-DMT	C	*N*-PAC	N-P5102
O-DMT	G	*N*-PAC	N-P5103
O-DMT	T	n/a	N-5104

			Bulk CPG			pack of 4 cols.			each		pack of 10 cols.		
Catalog #	Product Name	Pore Size	100 mg	1 gm	5 gm	40 nmole	0.2 µmole	1.0 µmole	10 µmole	15 µmole	40 nmole	0.2 µmole	1.0 µmole
N-P5101-05	deoxy Adenosine	500Å											
N-P5101-10	(*N*-PAC) 3'-Icaa CPG	1000Å	$15	$120	$550	$26	$32	$48	$144	$216	$52	$64	$96
N-P5101-20		2000Å											
N-P5102-05	deoxy Cytidine	500Å											
N-P5102-10	(*N*-PAC) 3'-Icaa CPG	1000Å	$15	$120	$550	$26	$32	$48	$144	$216	$52	$64	$96
N-P5102-20		2000Å											
N-P5103-05	deoxy Guanosine	500Å											
N-P5103-10	(*N*-PAC) 3'-Icaa CPG	1000Å	$15	$120	$550	$26	$32	$48	$144	$216	$52	$64	$96
N-P5103-20		2000Å											
N-5104-05	Thymidine 3'-Icaa CPG	500Å											
N-5104-10		1000Å	$8	$65	$280	$26	$32	$40	$85	$120	$52	$64	$96
N-5104-20		2000Å											

Please refer to deprotection conditions on previous page

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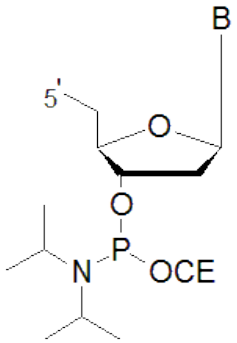


Fast Deprotection Phosphoramidites using AMA Reagents

5'	B	Protection	Catalog#
O-DMT	A	*N*-PAC	ANP-6661
O-DMT	C	*N*-Ac	ANP-5560
O-DMT	G	n-tBPAC	ANP-5668
O-DMT	T	n/a	ANP-5554

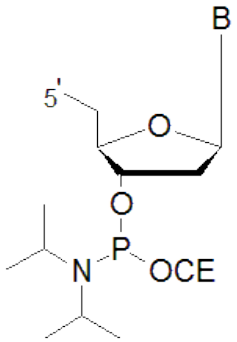
Catalog #	Product name	250mg	500mg	1gm	2gm	5gm	10gm
ANP-6661	deoxy Adenosine (*N*-PAC) 3'-CEP, *M.W. 887.96*	$22	$40	$65	$105	$210	$375
ANP-5560	deoxy Cytidine (*N*-Ac) 3'-CEP, *M.W. 771.84*	$22	$40	$65	$105	$210	$375
ANP-5668	deoxy Guanosine (n-tBPAC) 3'-CEP, *M.W. 960.06*	$22	$40	$65	$105	$210	$375
ANP-5554	Thymidine 3'-CEP, *M.W. 744.81*	$11	$22	$40	$ 65	$145	$270

Deprotection Conditions

- 5 minutes at R.T. (for cleavage of oligo) using AMA Reagent. AMA (Catalog # RN-1450 listed on page #19) is a 50:50 ratio of ammonium hydroxide and methyl amine.
- Cleavage of base protecting groups can be accomplished by either:
  using AMA at 37°C for 30 minutes, or
  using AMA at 55°C for 10 minutes.

For shorter sequences, standard base protected dA (*N*-Bz) amidite ANP-5551, dG (*N*-iBu) amidite ANP-5553, along with dC (*N*-Ac) amidite ANP-5560 are all recommended; however, for longer sequences it is recommended to use the above Fast Deprotecting Phosphoramidites, i.e. dA (*N*-PAC) amidite, dG (n-tBPAC) amidite, with the dC (*N*-Ac) amidite.

NOTE: Ancillary reagents for DNA synthesis using Fast Deprotecting Phosphoramides are available at ChemGenes and are listed on pages 17-23.



Base Unprotected Phosphoramidites for DNA Synthesis

5'	B	Protection	Catalog#
O-DMT	A	none	ANP-7771 NEW!
O-DMT	C	none	ANP-7772 NEW!
O-DMT	G	none	ANP-7773 NEW!

ChemGenes now offers deoxy nucleoside phosphoramidites of dA,dC & dG which do not have base protecting groups. The oligonucleotide coupling per step goes essentially quantitative. The synthesis using these phosphoramidites allows oligonucleotide synthesis which does not require ammonia normally used for base deprotection.

Catalog #	Product name	250mg	500mg	1gm	2gm
ANP-7771 NEW!	2'-deoxy Adenosine 5'-DMT 3'-CEP, *M.W. 753.83*	$55	$100	$195	$380
ANP-7772 NEW!	2'-deoxy Cytidine 5'-DMT 3'-CEP, *M.W. 729.80*	$55	$100	$195	$380
ANP-7773 NEW!	2'-deoxy Guanosine 5'-DMT 3'-CEP, *M.W. 769.83*	$55	$100	$195	$380

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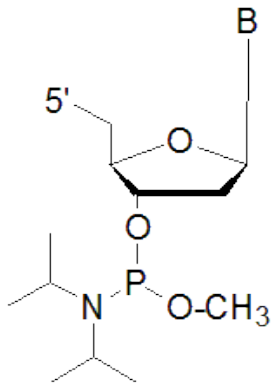

Natural DNA Amidites having *P*-methoxy, with bases deprotected using standard conditions

5'	B	Protection	Catalog#
O-DMT	A	*N*-Bz	ANP-3761
O-DMT	C	*N*-Bz	ANP-3762
O-DMT	G	*N*-iBu	ANP-3763
O-DMT	G	*N,N*-DMA	ANP-3768 NEW!
O-DMT	T	n/a	ANP-3764
O-DMT	A	*N*-Bz	ANP-3766
O-DMT	G	*N*-iBu	ANP-3767

Catalog #	Product Name	250mg	500mg	1gm	2gm	5gm
ANP-3761	deoxy Adenosine (*N*-Bz) 3'-*P*-methoxy phosphoramidite, *M.W. 818.90*	$20	$40	$75	$145	$350
ANP-3762	deoxy Cytidine (*N*-Bz) 3'-*P*-methoxy phosphoramidite, *M.W. 794.87*	$20	$40	$75	$145	$350
ANP-3763	deoxy Guanosine (*N*-iBu) 3'-*P*-methoxy phosphoramidite, *M.W. 800.88*	$20	$40	$75	$145	$350
ANP-3768 NEW!	deoxy Guanosine (*N,N*-dimethylacetamidine) 3'-*P*-methoxy phosphoramidite, *M.W. 783.90*	$30	$50	$85	$155	$360
ANP-3764	Thymidine 3'-*P*-methoxy phosphoramidite, *M.W. 705.78*	$20	$40	$75	$145	$350
ANP-3766	MMT-deoxy Adenosine (*N*-Bz) 3'-*P*-methoxy phosphoramidite, *M.W. 788.87*	$25	$45	$80	$155	$365
ANP-3767	MMT-deoxy Guanosine (*N*-iBu) 3'-*P*-methoxy phosphoramidite, *M.W. 770.85*	$25	$45	$80	$155	$365

Important : Deprotection Conditions

- For natural phospodiester: use thiophenol solution (Catalog # RN-1465 on page #17-24) to thoroughly remove the *P*-methoxy group prior to ammonia base deprotection.
- For *P*-methoxy phospodiester oligonucleotides: use PAC protected *P*-methoxy phospodiester listed on page #101 in combination with our ammonia free deprotection solution listed on page #98.

Please see page #101 for *P*-methoxy phospodiester with labile base deprotection (*P*-methoxy PAC Amidite).

For a description of the advantages of using MMT nucleoside phosphoramidites, please see page #2.

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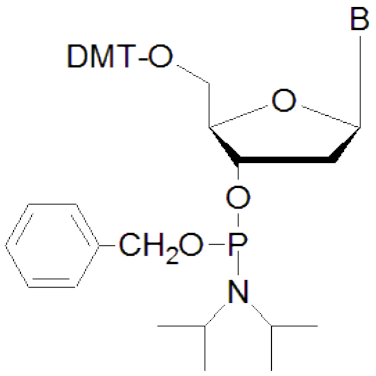

P-O-benzyl Phosphoramidites

5'	B	Protection	Catalog#
O-DMT	A	*N*-Bz	ANP-6731
O-DMT	C	*N*-Bz	ANP-6732
O-DMT	G	*N*-iBu	ANP-6733
O-DMT	T	n/a	ANP-6734

Catalog #	Product name	100mg	500mg	1gm
ANP-6731	deoxy Adenosine (*N*-Bz) 3'-*P*-*O*-benzyl phosphoramidite, *M.W. 894.99*	$24	$68	$128
ANP-6732	deoxy Cytidine (*N*-Bz) 3'-*P*-*O*-benzyl phosphoramidite, *M.W. 870.97*	$24	$68	$128
ANP-6733	deoxy Guanosine (*N*-iBu) 3'-*P*-*O*-benzyl phosphoramidite, *M.W. 876.98*	$24	$68	$128
ANP-6734	Thymidine 3'-*P*-*O*-benzyl phosphoramidite, *M.W. 781.87*	$22	$65	$115

Applications for *P*-O-benzyl phosphoramidite:

- Synthesis of Natural DNA fragments.
- Cleavage of *P*-*O*-benzyl phosphate occurs smoothly with aqueous ammonia.
- The synthesis of sequence specific phosphoramidites.

ref: *John Nielson and Marvin H. Caruthers, J. Am Chem Soc., 110, 6275-6276 (1988)*

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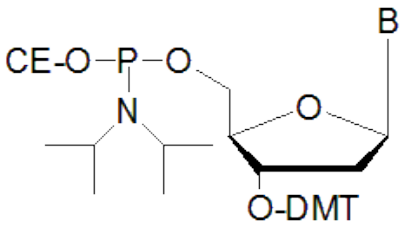
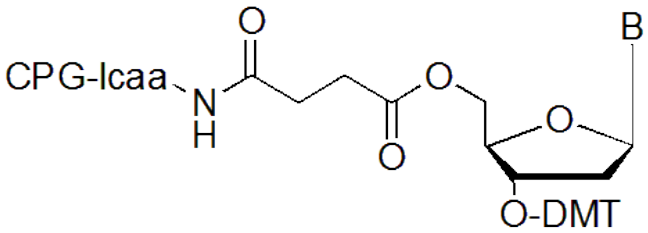


Reverse DNA Synthesis

3'	B	Protection	Catalog#
O-DMT	A	*N*-Bz	ANP-4671
O-DMT	C	*N*-Bz	ANP-4672
O-DMT	G	*N*-iBu	ANP-4673
O-DMT	T	n/a	ANP-4674

Catalog #	Product Name	250mg	500mg	1gm	2gm
ANP-4671	deoxy Adenosine (*N*-Bz) 5'-CEP, *M.W. 857.92*	$55	$100	$195	$380
ANP-4672	deoxy Cytidine (*N*-Bz) 5'-CEP, *M.W. 833.89*	$55	$100	$195	$380
ANP-4673	deoxy Guanosine (*N*-iBu) 5'-CEP, *M.W. 839.90*	$55	$100	$195	$380
ANP-4674	Thymidine 5'-CEP, *M.W. 744.80*	$55	$100	$195	$380



Standard CPG for Reverse DNA Synthesis

3'	B	Protection	Catalog #
O-DMT	A	*N*-Bz	N-3351
O-DMT	C	*N*-Bz	N-3352
O-DMT	G	*N*-iBu	N-3353
O-DMT	T	n/a	N-3354

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	pack of 4 cols. 0.2 μmole	pack of 4 cols. 1.0 μmole	pack of 10 cols. 0.2 μmole	pack of 10 cols. 1.0 μmole
N-3351-05 N-3351-10	deoxy Adenosine (*N*-Bz) 5'-Icaa CPG	500Å 1000Å	$45	$350	$100	$150	$200	$300
N-3352-05 N-3352-10	deoxy Cytidine (*N*-Bz) 5'-Icaa CPG	500Å 1000Å	$45	$350	$100	$150	$200	$300
N-3353-05 N-3353-10	deoxy Guanosine (*N*-iBu) 5'-Icaa CPG	500Å 1000Å	$45	$350	$100	$150	$200	$300
N-3354-05 N-3354-10	Thymidine 5'-Icaa CPG	500Å 1000Å	$45	$350	$100	$150	$200	$300

Application of Reverse Phosphoramidites:

- Synthesis of 3'-3'-linked DNA
- Synthesis of special oligonucleotides required to be coupled at the 5'-end selectively
- Synthesis of oligonucleotide from left to right (5'-3' direction)

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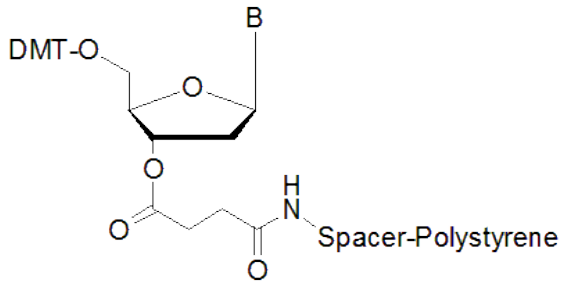
Phosphoramidites and Supports for Natural DNA Synthesis



Natural DNA with Succinyl Diamido Polystyrene

5'	B	Protection	Catalog #
O-DMT	A	*N*-Bz	N-7511
O-DMT	C	*N*-Bz	N-7512
O-DMT	G	*N*-iBu	N-7513
O-DMT	T	n/a	N-7514
O-DMT	C	*N*-Ac	N-7515

				Bulk Polystyrene Loading 30-40 µm/gm			pack of 4 cols.			pack of 10 cols.		
Catalog #	Product Name	Pore Size	Particle Size	100 mg	1 gm	5 gm	40 nmole	.02 µmole	1.0 µmole	40 nmole	0.2 µmole	1.0 µmole
N-7511-03	deoxy Adenosine (*N*-Bz) 3'-Diamido Polystyrene	300Å	60-70 microns	$22	$110	$440	$26	$32	$40	$52	$64	$80
N-7512-03	deoxy Cytidine (*N*-Bz) 3'-Diamido Polystyrene	300Å	60-70 microns	$22	$110	$440	$26	$32	$40	$52	$64	$80
N-7513-03	deoxy Guanosine (*N*-iBu) 3'-Diamido Polystyrene	300Å	60-70 microns	$22	$110	$440	$26	$32	$40	$52	$64	$80
N-7514-03	Thymidine 3'-Diamido Polystyrene	300Å	60-70 microns	$22	$110	$440	$26	$32	$40	$52	$64	$80
N-7515-03	deoxy Cytidine (*N*-Ac) 3'-Diamido Polystyrene	300Å	60-70 microns	$22	$110	$440	$26	$32	$40	$52	$64	$80

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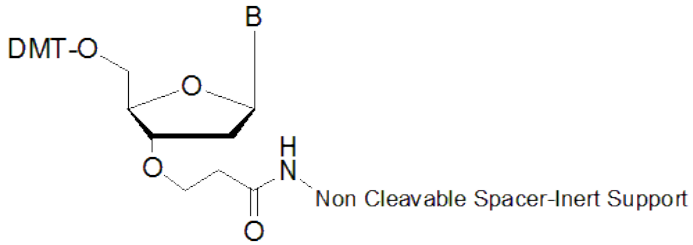


Non Cleavable Supports and Columns

5'	B	Protection	Catalog #
O-DMT	A	*N*-Bz	N-7521
O-DMT	C	*N*-Bz	N-7522
O-DMT	G	*N*-iBu	N-7523
O-DMT	T	n/a	N-7524

Catalog #	Product Name	Pore Size	Particle Size	Bulk loading 30-40 μm/gm 100 mg	1 gm	pack of 4 cols. 40 nmole	0.2 μmole	1.0 μmole	pack of 10 cols. 40 nmole	0.2 μmole	1.0 μmole
N-7521-15 N-7521-60	deoxy Adenosine (*N*-Bz) 3'-non-cleavable long chain spacer	300Å	15-20 μM 60-70 μM	$55	$280	$110	$130	$150	$220	$260	$300
N-7522-15 N-7522-60	deoxy Cytidine (*N*-Bz) 3'-non-cleavable long chain spacer	300Å	15-20 μM 60-70 μM	$55	$280	$110	$130	$150	$220	$260	$300
N-7523-15 N-7523-60	deoxy Guanosine (*N*-iBu) 3'-non-cleavable long chain spacer	300Å	15-20 μM 60-70 μM	$55	$280	$110	$130	$150	$220	$260	$300
N-7524-15 N-7524-60	Thymidine 3'-non-cleavable long chain spacer	300Å	15-20 μM 60-70 μM	$55	$280	$110	$130	$150	$220	$260	$300

Non Cleavable Solid Supports And Columns

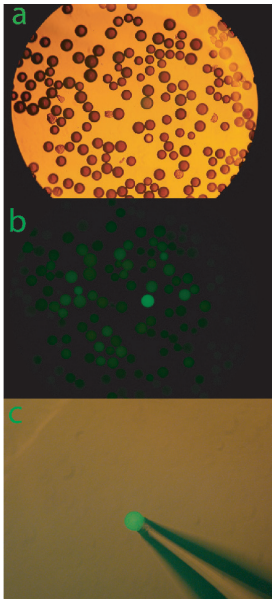
(For Affinity Chromatography & One bead one Compound combinatorial libraries)

ChemGenes has developed a non-cleavable support, which is inert in nature and is amenable to oligonucleotide synthesis. Using our irreversible support leads to oligo synthesis of coupling efficiencies of 98-99% per step for a chain length of 20-40 mers.

Our Inert beads are uniform particles. The support bound oligonucleotides, which are irreversibly bound, have extensive applications in molecular biology. Some of the common applications are as follows:

1. Affinity based chromatography for oligonucleotides, proteins, and other macromolecules.
2. Design and construction of one bead one compound libraries by split sythesis methods.[1]
3. PCR amplification is possible with the support attached to oligonucleotides. See photo to the right for bead based aptamer library screening, sequencing analysis of PCR products.
4. Molecular Biology R&D experiments on bead bound oligonucleotides have performed beyond expectations.

1.This method has been used by Gorenstein & Coworkers *(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 the selection of combinatorial oligonucleotides aptamer and PCR amplification followed by sequencing.



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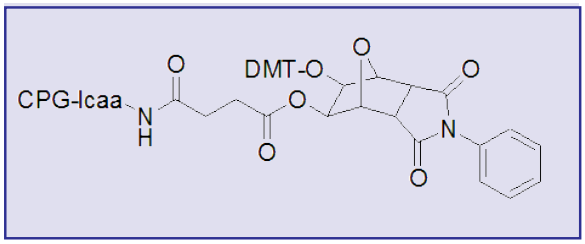
UnyLinker Universal Support for Synthesis of Oligonucleotides



Catalog #		Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 250 mg	Bulk CPG 1 gm	pack of 4 cols. 40 nmole	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	each 10 µmole	each 15 µmole	pack of 10 cols. 40 nmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-4000-05	NEW!	UnyLinker Icaa CPG	500Å											
N-4000-10			1000Å	$8	$18	$65	$26	$32	$40	$85	$120	$52	$64	$80
N-4000-20			2000Å	$10	$22	$75	$30	$36	$48	$98	$142	$62	$74	$96
N-4000-03	NEW!	UnyLinker Polystyrene	300Å	$14	$27	$80	$38	$44	$56	$109	$149	$70	$82	$104

UNYLINKER™ Universal Support for synthesis of Oliogodeoxynucleotides

(Fully compatible with standard phosphoramidite reagents and synthesis conditions) Average coupling efficiency of >99% per step.

Quantitative cleavage from support with standard ammonia or methylamine deprotection conditions.

No need to synthesize four deoxy nucleosides & avoids need to synthesize difficult to procure 2' or 3'- modified nucleoside based on support

Improvement in the quality of oligonucleotides synthesized, since the quality of succinates can vary from batch to batch and supploer to suppliers.

Cost reduction due to single support for the Oligo synthesis instead of several supports.

Releases work load of QC and material management and testing of many products verses a single support.

UNYLINKER universal support does not contribute any atom to API and hence need not be classified as a starting material.

Therefore offer major advantage when dealing with QA and FDA.

High purity Phosphorothioate synthesis is performed as usual.

2'-O-alkyl oligonucleotides are synthesized in high purity.

LNA oligonucleotides are synthesized in high high purity.

Fully compatible with Biotin and Fluorescein and other labeled oligonucleotides.

*UNYLINKER™ is a trademark of Isis Pharmaceuticals, Inc. The above products are covered under Isis patent #7,202,264. and ChemGenes Corp. holds world wide marketing rights

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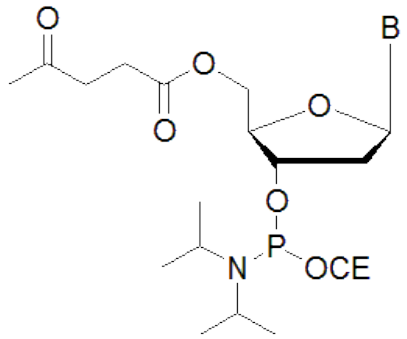
Phosphoramidites and Supports for Natural DNA Synthesis



Levulinyl DNA Phosphoramidites with Standard Base Protection

B	Protection	Catalog#
A	*N*-Bz	ANP-5001
C	*N*-Bz	ANP-5002
G	*N*-iBu	ANP-5003
T	n/a	ANP-5004

Catalog#	Product Name	250mg	500mg	1gm	2gm
ANP-5001	5'-Levulinyl deoxy Adenosine (*N*-Bz) 3'-CEP, *M.W. 653.67*	$50	$90	$160	$350
ANP-5002	5'-Levulinyl deoxy Cytidine (*N*-Bz) 3'-CEP, *M.W. 629.64*	$50	$90	$160	$350
ANP-5003	5'-Levulinyl deoxy Guanosine (*N*-iBu) 3'-CEP, *M.W. 635.65*	$50	$90	$160	$350
ANP-5004	5'-Levulinyl Thymidine 3'-CEP, *M.W. 540.55*	$50	$90	$160	$350

Levulinyl Deprotection Solution

Catalog#	Pricing
CLP-7171	$22.00 / 5 ml
	$36.00 / 10 ml

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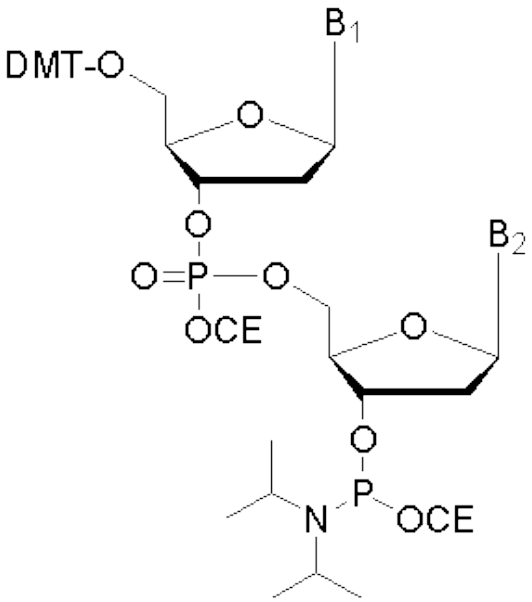
Oligo Synthesis Products

Phosphoramidites and Supports for Natural DNA Synthesis



Dimers

Catalog#	Pricing
Pricing applies to all dimers listed below	$ 600.00 / 100 µmole $1,100.00 / 250 mg

B_1	B_1 Protection	B_2	B_2 Protection	Catalog #	M.W.	Chemical Formula
A	*N*-Bz	A	*N*-Bz	ANP-2501-CE	1328.31	$C_{67}H_{77}N_{13}O_{13}P_2$
A	*N*-Bz	C	*N*-Bz	ANP-2502-CE	1304.28	$C_{66}H_{71}N_{11}O_{14}P_2$
A	*N*-Bz	G	*N*-iBu	ANP-2503-CE	1310.29	$C_{67}H_{73}N_{13}O_{14}P_2$
A	*N*-Bz	T	n/a	ANP-2504-CE	1215.19	$C_{66}H_{68}N_{10}O_{14}P_2$
C	*N*-Bz	A	*N*-Bz	ANP-2505-CE	1304.28	$C_{66}H_{71}N_{11}O_{14}P_2$
C	*N*-Bz	C	*N*-Bz	ANP-2506-CE	1280.26	$C_{65}H_{71}N_9O_{15}P_2$
C	*N*-Bz	G	*N*-iBu	ANP-2507-CE	1286.27	$C_{63}H_{73}N_{11}O_{15}P_2$
C	*N*-Bz	T	n/a	ANP-2508-CE	1191.16	$C_{59}H_{68}N_8O_{15}P_2$
G	*N*-iBu	A	*N*-Bz	ANP-2509-CE	1310.29	$C_{64}H_{73}N_{13}O_{14}P_2$
G	*N*-iBu	C	*N*-Bz	ANP-2510-CE	1286.27	$C_{63}H_{73}N_{11}O_{15}P_2$
G	*N*-iBu	G	*N*-iBu	ANP-2511-CE	1292.27	$C_{61}H_{75}N_{13}O_{15}P_2$
G	*N*-iBu	T	n/a	ANP-2512-CE	1197.17	$C_{57}H_{70}N_{10}O_{15}P_2$
T	n/a	A	*N*-Bz	ANP-2513-CE	1215.19	$C_{66}H_{68}N_{10}O_{14}P_2$
T	n/a	C	*N*-Bz	ANP-2514-CE	1191.16	$C_{59}H_{68}N_8O_{15}P_2$
T	n/a	G	*N*-iBu	ANP-2515-CE	1197.17	$C_{57}H_{70}N_{10}O_{15}P_2$
T	n/a	T	n/a	ANP-2516-CE	1102.07	$C_{53}H_{65}N_7O_{15}P_2$

Dimer Phosphoramidites:

ChemGenes has developed unique polystyrene supports and columns that have special appeal due to rigidity, swelling, and inertness towards moisture and water.

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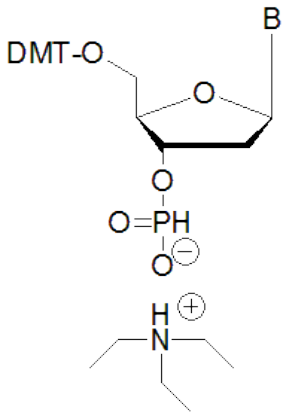
Phosphoramidites and Supports for Natural DNA Synthesis



H-Phosphonate Monomers

5'	B	Protection	Catalog#
O-DMT	A	*N*-Bz	ANP-3410
O-DMT	C	*N*-Bz	ANP-3411
O-DMT	G	N-iBu	ANP-3412
O-DMT	T	n/a	ANP-3413

Catalog#	Product name	250mg	500mg
ANP-3410	deoxy Adenosine (*N*-Bz) 3'-*H*-Phosphonate TEA Salt, *M.W. 822.87*	$30	$50
ANP-3411	deoxy Cytidine (*N*-Bz) 3'-*H*-Phosphonate TEA Salt, *M.W. 798.84*	$30	$50
ANP-3412	deoxy Guanosine (N-iBu) 3'-*H*-Phosphonate TEA Salt, *M.W. 804.86*	$30	$50
ANP-3413	Thymidine 3'-*H*-Phosphonate TEA Salt, *M.W. 709.76*	$30	$50

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Ancillary Reagents for Automated DNA Synthesizers
(For H-Phosphonate Chemistry)

Catalog #	Product Name	Qty.	Price
RN-6464	Dipentafluorophenyl Carbonate* (Highly efficient coupling reagent for H-phosphonate chemistry and superior to Adamantanecarbonchloride)	2 gm 5 gm	$ 85 $190
RN-6664	Activator for monomers and Capping Reagent (Adamantane Carbonyl Chloride)	2 gm	$ 20
RN-4523-P	Acetonitrile/Pyridine(50:50), Anhydrous (Diluent for Monomers)	100 ml	$ 28
RN-1356-P2	Acetonitrile/Pyridine(95:5), Anhydrous (Diluent for Activator)	100 ml	$ 28
RN-7684-AP	Acetonitrile/Pyridine (Wash Solvent)	960 ml	$ 77
RN-6645-IP	Capping for ABI Synthesizers (Isopropyl Phosphite/Acetonitrile/Pyridine)	45 ml	$ 37
RN-1210-PHT	**Oxidation Solution 1 (Iodine in Pyridine/H_2O/THF)	45 ml	$ 18
RN-1220-THT	**Oxidation Solution 2 (THF/H_2O/TEA)	45 ml	$ 18

* V.A. *Efimov, A.L. Kalinkina, and O.G. Chakhmakhcheva, Nucl. Acids. res., Vol. 2 5337-5344 (1993).*
*** Note: Both oxidation solutions 1 & 2 are needed for H-phosphonate oxidation.*

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ABI Oligonucleotide Synthesizers

Catalog #	Product Name	Qty.	Price
RN-1447-S-AB30	Acetonitrile Anhydrous	45 ml	$ 9
RN-1447-M-AB30	(Phosphoramidite Diluent & Washings)	100 ml	$ 14
RN-1447-L-AB30		450 ml	$ 20
RN-1448-M-AB30	Acetonitrile Wash Grade	1 L	$ 32
RN-1448-L-AB30		4 L	$ 90
RN-1551-SS-AB30	Activation Reagent NEW!	45 ml	$ 35
RN-1551-S-AB30	(0.45 M 5-Ethylthio Tetrazole/Acetonitrile)	200 ml	$ 87
RN-1551-M-AB30		450 ml	$140
RN-1551-L-AB30		2 L	$410
RN-1466-SS-AB30	Activation Reagent	45 ml	$ 35
RN-1466-S-AB30	(0.25 M 5-Ethylthio Tetrazole/Acetonitrile)	200 ml	$ 87
RN-1466-M-AB30		450 ml	$140
RN-1466-L-AB30		2 L	$410
RN-1467-SS-AB30	Activation Reagent	45 ml	$ 35
RN-1467-S-AB30	(0.25 M 4,5-Dicyanoimidazole/Acetonitrile)	200 ml	$ 87
RN-1467-M-AB30		450 ml	$140
RN-1467-L-AB30		2 L	$410
RN-1452	Activation Reagent (BTT Solution) NEW! (0.3M Benzylthio Tetrazole/Acetonitrile)	45 ml	$ 35
RN-1458-SS-AB30	CAP A	45 ml	$ 15
RN-1458-S-AB30	(Acetic Anhydride/Pyridine/THF)	200 ml	$ 25
RN-1458-M-AB30		450 ml	$ 54
RN-1458-L-AB30		2 L	$230
RN-1481-SS-AB30	CAP B	45 ml	$ 15
RN-1481-S-AB30	(10% N-Methylimidazole/THF)	200 ml	$ 25
RN-1481-M-AB30		450 ml	$ 54
RN-1481-L-AB30		2 L	$260
RN-7776-SS-AB30	CAP B	45 ml	$ 15
RN-7776-S-AB30	(16% N-Methylimidazole/THF)	200 ml	$ 25
RN-7776-M-AB30		450 ml	$ 54
RN-7776-L-AB30		2 L	$260
RN-1468-M-AB30	DMT Removal Reagent	450 ml	$ 47
RN-1468-L-AB30	(3% Dichloracetic Acid/Dichloromethane)	2 L	$220
RN-1462-M-AB30	DMT Removal Reagent	450 ml	$ 27
RN-1462-L-AB30	(3% Trichloracetic Acid/Dichloromethane)	2 L	$108
RN-1455-S-AB30	Oxidation Solution	200 ml	$ 20
RN-1455-M-AB30	(0.02 M Iodine/Pyridine/H_2O/THF)	450 ml	$ 40
RN-1455-L-AB30		2 L	$168
RN-1456-S-AB30	Oxidation Solution	200 ml	$ 20
RN-1456-M-AB30	(0.1 M Iodine/Pyridine/H_2O/THF)	450 ml	$ 40
RN-1456-L-AB30		2 L	$168
RN-1465-AB30	*Thiophenol/Triethylamine/Dioxane	10 ml	$ 38
RN-1535-L-AB30	**Sulfurizing Reagent (Beaucage Reagent) for Introduction of Phosphorothioate (S-oligonucleotide)	2 gm	$ 90
BL-1536-S-AB30	Silanized Bottles for Beaucage Reagent	100 ml	$ 8
BL-1536-M-AB30		250 ml	$ 8
BL-1536-L-AB30		500 ml	$ 8
RN-1450-AB30	AMA Reagent	25 ml	$ 25

* Used in selective removal of p-methoxy groups in oligos.

** For the separate listing of Beaucage Reagent see page 145. II DDTT Solution (Sulfurizing Reagents) see page 19, 22

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ABI 3900 Oligonucleotide Synthesizers

Catalog #	Product Name	Qty.	Price
RN-1447-L-AB39	Acetonitrile Anhydrous (Phosphoramidite Diluent & Washings)	450 ml	$ 20
RN-1448-M-AB39	Acetonitrile Wash Grade	1 L	$ 32
RN-1448-L-AB39		4 L	$ 90
RN-1551-M-AB39	Activation Reagent NEW!	450 ml	$140
RN-1551-L-AB39	(0.45 M 5-Ethylthio Tetrazole/Acetonitrile)	2 L	$410
RN-1466-M-AB39	Activation Reagent	450 ml	$140
RN-1466-L-AB39	(0.25 M 5-Ethylthio Tetrazole/Acetonitrile)	2 L	$410
RN-1467-M-AB39	Activation Reagent	450 ml	$140
RN-1467-L-AB39	(0.25 M 4,5-Dicyanoimidazole/Acetonitrile)	2 L	$410
RN-1452	Activation Reagent (BTT Solution) NEW! (0.3M Benzylthio Tetrazole/Acetonitrile)	45 ml	$ 35
RN-1458-M-AB39	CAP A	450 ml	$ 40
RN-1458-L-AB39	(Acetic Anhydride/Pyridine/THF)	2 L	$168
RN-1481-M-AB39	CAP B	450 ml	$ 40
RN-1481-L-AB39	(10% N-Methylimidazole/THF)	2 L	$168
RN-7776-M-AB39	CAP B	450 ml	$ 40
RN-7776-L-AB39	(16% N-Methylimidazole/THF)	2 L	$168
RN-1468-M-AB39	DMT Removal Reagent	450 ml	$ 47
RN-1468-L-AB39	(3% Dichloracetic Acid/Dichloromethane)	2 L	$220
RN-1462-M-AB39	DMT Removal Reagent	450 ml	$ 27
RN-1462-L-AB39	(3% Trichloracetic Acid/Dichloromethane)	2 L	$108
RN-1455-M-AB39	Oxidation Solution	450 ml	$ 60
RN-1455-L-AB39	(0.02 M Iodine/Pyridine/H_2O/THF)	2 L	$250
RN-1456-M-AB39	Oxidation Solution	450 ml	$ 60
RN-1456-L-AB39	(0.1 M Iodine/Pyridine/H_2O/THF)	2 L	$250
RN-1465-AB39	*Thiophenol/Triethylamine/Dioxane	10 ml	$ 38
RN-1535-L-AB39	**Sulfurizing Reagent (Beaucage Reagent) for Introduction of Phosphorothioate (S-oligonucleotide)	2 gm	$ 90
RN-1688	****DDTT Solution (Sulfurizing Reagent) NEW! (0.05 M)	100 ml	$ 65
	(0.05 M)	200 ml	$ 125
	(0.05 M)	450 ml	$ 225
	(0.10 M)	100 ml	$ 88
	(0.10 M)	200 ml	$ 160
	(0.10 M)	450 ml	$ 310
BL-1535-S-AB39	Silanized Bottles for Beaucage Reagent	100 ml	$ 8
BL-1535-M-AB39		250 ml	$ 8
BL-1535-L-AB39		500 ml	$ 8
RN-1450-AB39	AMA Reagent	25 ml	$ 25

* Used in selective removal of p-methoxy groups in oligos.
** For the separate listing of Beaucage Reagent see page 145.
*** Moisture Content: less than 50 ppm. Bottles are prepacked with drying traps an extra moisture free environment.
**** For Bulk pricing and details of Solid DDTT Solution (Sulfurizing Reagents) see page 145.

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Akta Oligonucleotide Synthesizers

Catalog #	Product Name	Qty.	Price
RN-2202-M-OP	Cap A NEW! (N-Methyl imidazole; 20% in Acetonitrile)	4 Liter	$ 304
RN-2217-M-OP	Cap B1 NEW! (Acetic Anhydride; 40% (v:v) in Acetonitrile)	4 Liter	$ 208
RN-2225-M-OP	Cap B2 NEW! (Symmetrical Collidine; 60% (v:v) in Acetonitrile)	4 Liter	$ 416
RN-2232-M-OP	Activator NEW! (Benzyl thio tetrazole; 0.2 M in acetonitrile)	4 Liter	$ 512
RN-2238-M-OP	Oxidizer NEW! (50 mM Iodine in 10% Water/Pyridine)	4 Liter	$ 272
RN-2242-M-OP	Deblock NEW! (3% DCA in Toluene)	4 Liter	$ 272

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Expedite Oligonucleotide Synthesizers

Catalog #	Product Name	8905 Qty.	8905 Price	8909 Qty.	8909 Price
RN-1447-S-EX	Acetonitrile Anhydrous	45 ml	$ 9	45 ml	$ 9
RN-1447-M-EX	(Phosphoramidite Diluent & Washings)	100 ml	$ 14	100 ml	$ 14
RN-1447-L-EX		450 ml	$ 20	450 ml	$ 20
RN-1448-M-EX	Acetonitrile Wash Grade	1 L	$ 32	1 L	$ 32
RN-1448-L-EX		4 L	$ 90	4 L	$ 90
RN-1551-SS-EX	Activation Reagent NEW!	60 ml	$ 40		
RN-1551-S-EX	(0.45 M 5-Ethylthio Tetrazole/Acetonitrile)	200 ml	$ 87	200 ml	$ 87
RN-1551-M-EX		450 ml	$140	450 ml	$140
RN-1551-L-EX		2 L	$410	2 L	$410
RN-1466-SS-EX	Activation Reagent	60 ml	$ 40		
RN-1466-S-EX	(0.25 M 5-Ethylthio Tetrazole/Acetonitrile)	200 ml	$ 87	200 ml	$ 87
RN-1466-M-EX		450 ml	$140	450 ml	$140
RN-1466-L-EX		2 L	$410	2 L	$410
RN-1467-SS-EX	Activation Reagent	60 ml	$ 40		
RN-1467-S-EX	(0.25 M 4,5-Dicyanoimidazole/Acetonitrile)	200 ml	$ 87	200 ml	$ 87
RN-1467-M-EX		450 ml	$140	450 ml	$140
RN-1467-L-EX		2 L	$410	2 L	$410
RN-1452	Activation Reagent (BTT Solution) NEW! (0.3M Benzylthio Tetrazole/Acetonitrile)	45 ml	$35		
RN-1458-SS-EX	CAP A	60 ml	$ 17		
RN-1458-S-EX	(Acetic Anhydride/Pyridine/THF)	90 ml	$ 19	200 ml	$ 25
RN-1458-M-EX		450 ml	$ 54	450 ml	$ 54
RN-1458-L-EX		2 L	$230	2 L	$230
RN-1481-SS-EX	CAP B	60 ml	$ 17		
RN-1481-S-EX	(10% N-Methylimidazole/THF)	90 ml	$ 19	200 ml	$ 25
RN-1481-M-EX		450 ml	$ 54	450 ml	$ 54
RN-1481-L-EX		2 L	$260	2 L	$230
RN-7776-SS-EX	CAP B	60 ml	$ 17		
RN-7776-S-EX	(16% N-Methylimidazole/THF)	90 ml	$ 19	200 ml	$ 25
RN-7776-M-EX		450 ml	$ 54	450 ml	$ 54
RN-7776-L-EX		2 L	$260	2 L	$230
RN-1468-M-EX	DMT Removal Reagent	180 ml	$ 25	180 ml	$ 25
RN-1468-L-EX	(2.5% Dichloracetic Acid/Dichloromethane)	900 ml	$ 85	900 ml	$ 85
RN-1462-M-EX	DMT Removal Reagent	180 ml	$ 15	180 ml	$ 15
RN-1462-L-EX	(3% Trichloracetic Acid/Dichloromethane)	900 ml	$ 75	900 ml	$ 75
RN-1455-S-EX	Oxidation Solution	60 ml	$ 10	60 ml	$ 10
RN-1455-M-EX	(0.02 M Iodine/Pyridine/H_2O/THF)	200 ml	$ 20	200 ml	$ 20
RN-1455-L-EX		450 ml	$ 40	450 ml	$ 40
RN-1456-S-EX	Oxidation Solution	200 ml	$ 20		
RN-1456-M-EX	(0.1 M Iodine/Pyridine/H_2O/THF)	450 ml	$ 40		
RN-1456-L-EX		2 L	$168		
RN-1465-EX	*Thiophenol/Triethylamine/Dioxane	10 ml	$ 38	10 ml	$ 38
RN-1535-S-EX	**Sulfurizing Reagent (Beaucage Reagent) for	100 mg	$ 15	100 mg	$ 15
RN-1535-M-EX	Introduction of Phosphorothioate (S-oligonucleotide)	1 gm	$ 50	1 gm	$ 50
RN-1535-L-EX		2 gm	$ 90	2 gm	$ 90
BL-1535-S-EX	Silanized Bottles for Beaucage Reagent	100 ml		100 ml	$ 8
BL-1535-M-EX		250 ml	$ 8	250 ml	$ 8
BL-1535-L-EX		500 ml		500 ml	$ 8
RN-1450-EX	AMA Reagent	25 ml	$ 25	25 ml	$ 25

* Used in selective removal of p-methoxy groups in oligos. ** For the separate listing of Beaucage Reagent see page 145.

DDTT Solution (Sulfurizing Reagents) see page 19, 22

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MerMade Oligonucleotide Synthesizers

Catalog #	Product Name	Qty.	Price
RN-1447-S-MR	Acetonitrile Anhydrous	45 ml	$ 9
RN-1447-M-MR	(Phosphoramidite Diluent & Washings)	100 ml	$ 14
RN-1447-L-MR		450 ml	$ 20
RN-1448-M-MR	Acetonitrile Wash Grade	1 L	$ 32
RN-1448-L-MR		4 L	$ 90
RN-1551-M-MR	Activation Reagent NEW!	450 ml	$140
RN-1551-L-MR	(0.45 M 5-Ethylthio Tetrazole/Acetonitrile)	960 ml	$218
RN-1466-M-MR	Activation Reagent	450 ml	$140
RN-1466-L-MR	(0.25 M 5-Ethylthio Tetrazole/Acetonitrile)	960 ml	$218
RN-1467-M-MR	Activation Reagent	450 ml	$140
RN-1467-L-MR	(0.25 M 4,5-Dicyanoimidazole/Acetonitrile)	960 ml	$218
RN-1452	Activation Reagent (BTT Solution) NEW!	45 ml	$35
	(0.3M Benzylthio Tetrazole/Acetonitrile)		
RN-1458-M-MR	CAP A	450 ml	$ 70
RN-1458-L-MR	(Acetic Anhydride/THF/2,6-Lutidine)	960 ml	$109
RN-1481-SS-MR	CAP B	450 ml	$ 70
RN-1481-S-MR	(10% N-Methylimidazole/THF)	960 ml	$109
RN-7776-SS-MR	CAP B	450 ml	$ 70
RN-7776-S-MR	(16% N-Methylimidazole/THF)	960 ml	$109
RN-1468-M-MR	DMT Removal Reagent	450 ml	$ 47
RN-1468-L-MR	(2.5% Dichloracetic Acid/Dichloromethane)	960 ml	$220
RN-1462-M-MR	DMT Removal Reagent	450 ml	$ 27
RN-1462-L-MR	(3% Trichloracetic Acid/Dichloromethane)	960 ml	$ 85
RN-1455-S-MR	Oxidation Solution	450 ml	$ 60
RN-1455-M-MR	(0.02 M Iodine/Pyridine/H_2O/THF)	960 ml	$135
RN-1456-S-MR	Oxidation Solution	450 ml	$ 60
RN-1456-M-MR	(0.1 M Iodine/Pyridine/H_2O/THF)	960 ml	$135
RN-1465-MR	*Thiophenol/Triethylamine/Dioxane	10 ml	$ 38
RN-1535-S-MR	**Sulfurizing Reagent (Beaucage Reagent) for	100 mg	$ 15
RN-1535-M-MR	Introduction of Phosphorothioate (S-oligonucleotide)	1 gm	$ 50
RN-1535-L-MR		2 gm	$ 90
RN-1688	****DDTT Solution (Sulfurizing Reagent) NEW! (0.05 M)	100 ml	$ 65
	(0.05 M)	200 ml	$ 125
	(0.05 M)	450 ml	$ 225
	(0.10 M)	100 ml	$ 88
	(0.10 M)	200 ml	$ 160
	(0.10 M)	450 ml	$ 310
BL-1535-S-MR	Silanized Bottles for Beaucage Reagent	100 ml	$ 8
BL-1535-M-MR		250 ml	$ 8
BL-1535-L-MR		500 ml	$ 8
RN-1450-MR	AMA Reagent	25 ml	$ 25

* Used in selective removal of p-methoxy groups in oligos.
** For the separate listing of Beaucage Reagent see page 145.
**** For Bulk pricing and details of Solid DDTT Solution (Sulfurizing Reagents) see page 145.
*** Moisture Content: less than 50 ppm. Bottles are prepacked with drying traps an extra moisture free environment.

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PolyPlex Oligonucleotide Synthesizers

Catalog #	Product Name	Qty.	Price
RN-1447-S-PX	Acetonitrile Anhydrous	45 ml	$ 9
RN-1447-M-PX	(Phosphoramidite Diluent & Washings)	100 ml	$ 14
RN-1447-L-PX		450 ml	$ 20
RN-1448-M-PX	Acetonitrile Wash Grade	1 L	$ 32
RN-1448-L-PX		4 L	$ 90
RN-1551-M-PX	Activation Reagent NEW!	200 ml	$ 87
RN-1551-L-PX	(0.45 M 5-Ethylthio Tetrazole/Acetonitrile)		
RN-1466-M-PX	Activation Reagent	200 ml	$ 87
	(0.25 M 5-Ethylthio Tetrazole/Acetonitrile)		
RN-1467-M-PX	Activation Reagent	200 ml	$ 87
	(0.25 M 4,5-Dicyanoimidazole/Acetonitrile)		
RN-1452	Activation Reagent (BTT Solution) NEW!	45 ml	$ 35
	(0.3M Benzylthio Tetrazole/Acetonitrile)		
RN-1458-M-PX	CAP A	200 ml	$ 25
	(Acetic Anhydride/Pyridine/THF)		
RN-1481-M-PX	CAP B	200 ml	$ 30
	(10% N-Methylimidazole/THF)		
RN-7776-M-PX	CAP B	200 ml	$ 35
	(16% N-Methylimidazole/THF)		
RN-1468-M-PX	DMT Removal Reagent	2 L	$220
	(3% Dichloracetic Acid/Dichloromethane)		
RN-1462-L-PX	DMT Removal Reagent	2 L	$108
	(3% Trichloractic Acid/Dichloromethane)		
RN-1455-L-PX	Oxidation Solution	200 ml	$ 30
	(0.02 M Iodine/Pyridine/H_2O/THF)		
RN-1456-M-PX	Oxidation Solution	200 ml	$ 30
	(0.1 M Iodine/Pyridine/H_2O/THF)		
RN-1465-PX	*Thiophenol/Triethylamine/Dioxane	10 ml	$ 38
RN-1535-S-PX	**Sulfurizing Reagent (Beaucage Reagent) for	100 mg	$ 15
RN-1535-M-PX	Introduction of Phosphorothioate (S-oligonucleotide)	1 gm	$ 50
RN-1535-L-PX		2 gm	$ 90
BL-1535-S-PX	Silanized Bottles for Beaucage Reagent	100 ml	$ 8
BL-1535-M-PX		250 ml	$ 8
BL-1535-L-PX		500 ml	$ 8
RN-1688	****DDTT Solution (Sulfurizing Reagent) NEW! (0.05 M)	100 ml	$ 65
	(0.05 M)	200 ml	$ 125
	(0.05 M)	450 ml	$ 225
	(0.10 M)	100 ml	$ 88
	(0.10 M)	200 ml	$ 160
	(0.10 M)	450 ml	$ 310
RN-1450-PX	AMA Reagent	25 mk	$ 25

* Used in selective removal of p-methoxy groups in oligos.
** For the separate listing of Beaucage Reagent see page 145.
*** Moisture Content: less than 50 ppm. Bottles are prepacked with drying traps an extra moisture free environment.
**** For Bulk pricing and details of Solid DDTT Solution (Sulfurizing Reagents) see page 145.

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Summary of Modified Deoxy Phosphoramidites & Supports

The incorporation of modified purines and pyrimidines has been utilized to optimize DNA-protein interactions and sequence recognition for many proteins and enzymes such as repressor proteins, restriction endonucleases, modification enzymes, and promoters *(J. W. Dubendorff, P. L. de Hasett, M. S. Rosendahl, M. H. Caruthers, J. Biol. Chem., 262, 892, 1987; C. A. Brennan, M. D. Van Cleve, R. I. Gumpert, J. Biol. Chem., 261, 7270 & 7279, 1986)*. Applications for a variety of key modifications are described on the following pages.

ChemGenes carries a wide variety of modifed DNA phosphoramidites and supports. The products are summarized below.

4-Thio and 4-Triazolyl Products
Including 4-Thio Thymidine, 4-Thio deoxy Uridine, 4- Triazolyl Thymidine, and 4- Triazolyl deoxy Uridine.

deoxy Inosine and Uridine

C-5 substituted Pyrimidines
Include 5-Methyl dC (*N,N*-DMF) & 5-Methyl dC(*N*-Bz) Amidites & supports

(Alfa) deoxy Amidites

2'-O-Trifluoroacetamido propyl, 3'-TFA , 5'- Amino Products
Including 2' -Trifluoroacetoamido propyl Uridine, 2'-Trifluoroacetoamido propyl Cytidine, 3'- TFA Amino deoxy Uridine ,3' - Amino Trityl Thymidine, and 5'- Amino Thymidine.

Arabinosides and 3' -dA
Include ara Adenosine, ara Cytidine , and 3' - deoxy Adenosine (Cordycepin).

7-deaza modified amidites

Halogenated amidites and supports

N-Alkylated Base
Including N^1 -Methyl dA, N^1-Methyl dG, N^3 -Methyl dC, N^3- Methyl T, N^4 -Ethyl dC ,N^3 -Ethyl dC Amidites & supports.

Specially Modified Purines
Nebularine, 2 -Amino Purine deoxy Adenosine, & 2 - Fluoro deoxy Inosine (O6- trimethoxy silyl ethoxy)

2 Thio and IsoC, IsoG Amidites and Supports
Including 2 Thio Thymidine, 2 -Thio deoxy Uridine , deoxy Iso Guanosine, & deoxy IsoCytidine Amidites & Supports.

L-DNA Amidites and Supports

Abasic, Dideoxy , and 8-Oxo Products
Including Abasic & Reverse Abasic, 8-Oxo dA, 8-Oxo dG, and dideoxy A,C,G,T Amidites and Supports.

5'-O-Methyl DNA Phosphoramidites

5' DMT-5-formyl (diacetyl)-2'-deoxyuridine-3'-Phosphoramidites

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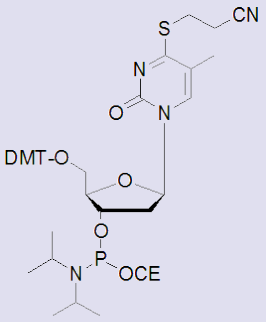
Oligo Synthesis Products

Phosphoramidites and Supports for Modified DNA Synthesis

4-Thio Thymidine CEP



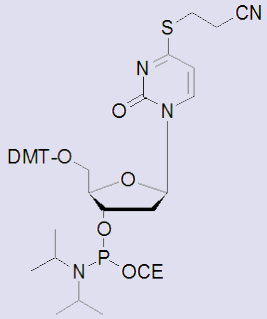
$C_{43}H_{52}N_5O_7PS$
Mol. Wt.: 813.94

Catalog#
ANP-6414

Pricing
$250.00 / 100 µmole
$600.00 / 250 mg

Purity: 98% +

4-Thio deoxy Uridine CEP



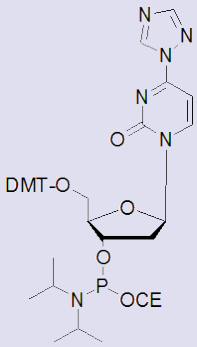
$C_{42}H_{50}N_5O_7PS$
Mol. Wt.: 799.92

Catalog#
ANP-7624

Pricing
$250.00 / 100 µmole
$600.00 / 250 mg

Purity: 98% +

4-Triazolyl deoxy Uridine CEP (Convertible dU)



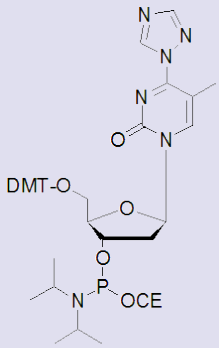
$C_{41}H_{48}N_7O_7P$
Mol. Wt.: 781.84

Catalog#
ANP-9211

Pricing
$105.00 / 100 µmole
$290.00 / 250 mg

Purity: 98% +

4-Triazolyl Thymidine CEP (Convertible dT)



$C_{42}H_{50}N_7O_7P$
Mol. Wt.: 795.86

Catalog#
ANP-9212

Pricing
$105.00 / 100 µmole
$290.00 / 250 mg

Purity: 98% +

3'-Succinyl Icaa Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-9758-05	4-Thio deoxy	500Å	$90	$735	$80	$120	$160	$240
N-9758-10	Uridine 3'-Icaa CPG	1000Å						
N-9925-05	4-Thio Thymidine	500Å	$80	$735	$90	$120	$160	$240
N-9925-10	3'-Icaa CPG	1000Å						

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AB30	AB39	EX	MR	PX

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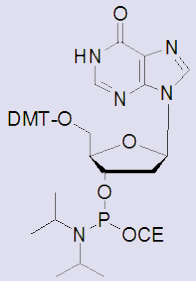
deoxy Inosine CEP



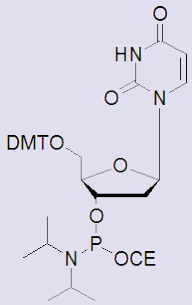
$C_{40}H_{47}N_6O_7P$
Mol. Wt.: 754.81

Catalog#
ANP-6411

Pricing
$ 50.00 / 100 µmole
$110.00 / 250 mg
$200.00 / 500 mg

Purity: 98% +

deoxy Uridine CEP



$C_{39}H_{47}N_4O_8P$
Mol. Wt.: 730.79

Catalog#
ANP-6131

Pricing
$ 50.00 / 100 µmole
$110.00 / 250 mg
$200.00 / 500 mg

Purity: 98% +

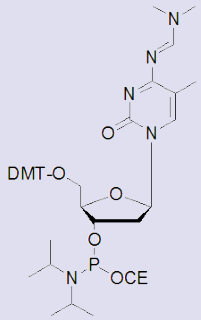
Deoxy Inosine amidites: Universal bases hybridize non-selectively to each of native bases. For a recent publication in this field, see, M. Berger, Y.W., A.K.Ogawa, D.L.McMinn, P.G. Schultz, and F.E. Rosenberg, Nucleic Acids Research, 2000, 28, 2911-2914.

3'-Succinyl Icaa Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	Bulk CPG 5 gm	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-5107-05	deoxy Uridine 3'-Icaa CPG	500Å							
N-5107-10		1000Å	$45	$185	$550	$48	$60	$96	$120
N-5107-20		2000Å							
N-5108-05	deoxy Inosine 3'-Icaa CPG	500Å							
N-5108-10		1000Å	$45	$185	$550	$48	$60	$96	$120
N-5108-20		2000Å							

5-Methyl deoxy Cytidine CEP

(5-Methyl deoxy Cytidine (N,N-DMF) CEP)



$C_{43}H_{55}N_6O_7P$
Mol. Wt.: 798.91

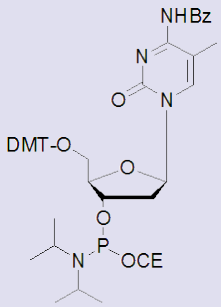
Catalog#
ANP-6422

Pricing
$ 70.00 / 100 µmole
$182.00 / 250 mg

Purity: 98% +

5-Methyl deoxy Cytidine CEP

(5-Methyl deoxy Cytidine (N-Bz) CEP)



$C_{47}H_{54}N_5O_8P$
Mol. Wt.: 847.93

Catalog#
ANP-6421

Pricing
$ 70.00 / 100 µmole
$182.00 / 250 mg

Purity: 98% +

Deprotection of DMF protected 5'-Methyl deoxy Cytidine takes 3-4 hours at 37°C with ammonia deprotection of oligo and is compatible with PAC chemistry.

5 Methyl dC Icaa Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG 100 gm	Bulk CPG 1 gm	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-1353-05	5-Methyl deoxy Cytidine (*N*-Bz)-3'-Icaa	500Å	$45	$175	$95	$135	$190	$270
N-1353-10	CPG	1000Å						
N-1355-05	5-Methyl deoxy Cytidine (*N,N*-DMF)	500Å	$45	$175	$95	$135	$190	$270
N-1355-10	3'-Icaa CPG	1000Å						

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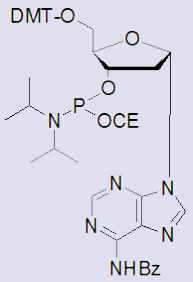
alpha deoxy Adenosine CEP



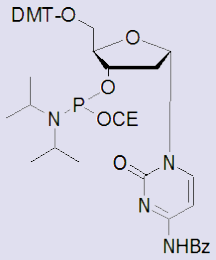
$C_{47}H_{52}N_7O_7P$
Mol. Wt.: 857.93

Catalog#
ANP-1651

Pricing
$165.00 / 100 µmole
$360.00 / 250 mg

Purity: 98% +

alpha deoxy Cytidine (*N*-Bz) CEP



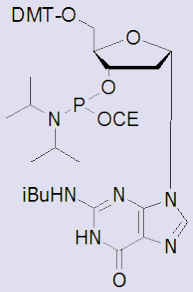
$C_{46}H_{52}N_5O_8P$
Mol. Wt.: 833.91

Catalog#
ANP-1652

Pricing
$165.00 / 100 µmole
$360.00 / 250 mg

Purity: 98% +

alpha deoxy Guanosine CEP



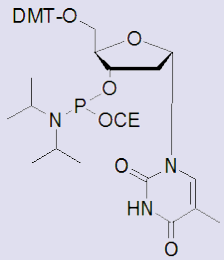
$C_{44}H_{54}N_7O_8P$
Mol. Wt.: 839.92

Catalog#
ANP-1653

Pricing
$165.00 / 100 µmole
$360.00 / 250 mg

Purity: 98% +

alpha Thymidine CEP



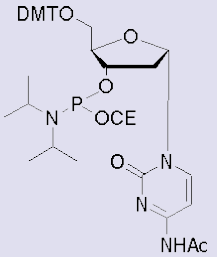
$C_{40}H_{49}N_4O_8P$
Mol. Wt.: 744.81

Catalog#
ANP-1654

Pricing
$165.00 / 100 µmole
$360.00 / 250 mg

Purity: 98% +

alpha deoxy Cytidine (*N*-Ac) CEP



$C_{41}H_{50}N_5O_8P$
Mol. Wt.: 771.84

Catalog#
ANP-4676

Pricing
$165.00 / 100 µmole
$360.00 / 250 mg

Purity: 98% +

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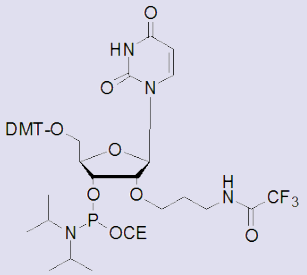
2'-O-Trifluoroacetoamido propyl Uridine CEP



$C_{44}H_{53}F_3N_5O_{10}P$
Mol. Wt.: 899.89

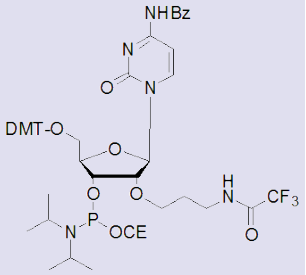
Catalog# ANP-7115

Pricing
$250.00 / 100 µmole
$700.00 / 250 mg

Purity: 98% +

2'-O-Trifluoroacetoamido propyl Cytidine CEP

(2'O-Trifluoroacetoamido propyl Cytidine (*N-Bz*) CEP)



$C_{51}H_{58}F_3N_6O_{10}P$
Mol. Wt.: 1003.01

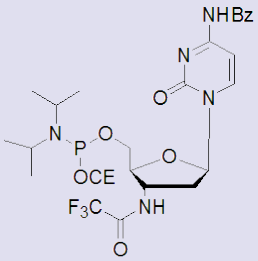
Catalog# ANP-7116

Pricing
$250.00 / 100 µmole
$700.00 / 250 mg

Purity: 98% +

3'-TFA Amino Cytidine CEP

(3'-TFA Amino 2'-deoxy Cytidine (*N-Bz*) CEP)



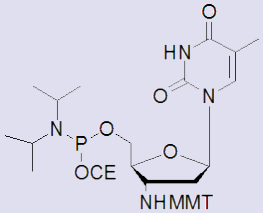
$C_{27}H_{34}F_3N_6O_6P$
Mol. Wt.: 626.56

Catalog# ANP-1242

Pricing
$240.00 / 100 µmole
$680.00 / 250 mg

Purity: 98% +

3'-MMT Amino Thymidine CEP



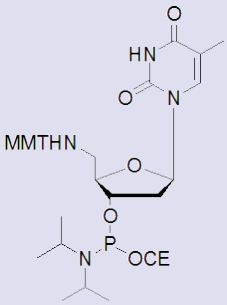
$C_{39}H_{48}N_5O_6P$
Mol. Wt.: 713.80

Catalog# ANP-8454

Pricing
$180.00 / 100 µmole
$420.00 / 250 mg

Purity: 98% +

5'-MMT Amino Thymidine CEP



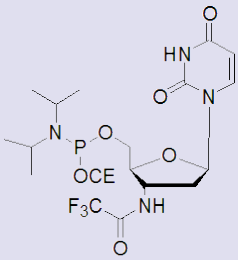
$C_{39}H_{48}N_5O_6P$
Mol. Wt.: 713.80

Catalog# ANP-9402

Pricing
$195.00 / 100 µmole
$405.00 / 250 mg

Purity: 98% +

3'-TFA Amino deoxy Uridine 5'-CEP



$C_{20}H_{29}F_3N_5O_6P$
Mol. Wt.: 523.44

Catalog# ANP-1245

Pricing
$300.00 / 100 µmole
$750.00 / 250 mg

Purity: 98% +

3'-Succinyl Icaa Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-9506-05	5'-Amino Thymidine	500Å	$110	$850	$120	$180	$240	$360
N-9506-10	3'-Icaa CPG	1000Å						

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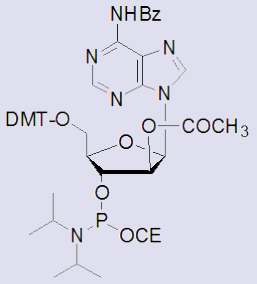
Oligo Synthesis Products

Phosphoramidites and Supports for Modified DNA Synthesis

Adenosine Arabinoside
araAdenosine (*N-Bz*) CEP



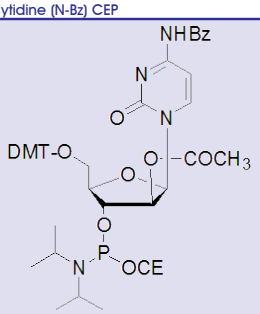
$C_{49}H_{54}N_7O_9P$
Mol. Wt.: 915.97

Catalog#
ANP-1711

Pricing
$155.00 / 100 µmole
$345.00 / 250 mg

Purity: 98% +

Cytosine Arabinoside
araCytidine (N-Bz) CEP



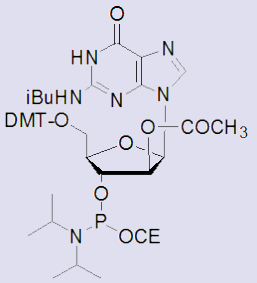
$C_{48}H_{54}N_5O_{10}P$
Mol. Wt.: 891.94

Catalog#
ANP-1712

Pricing
$160.00 / 100 µmole
$350.00 / 250 mg

Purity: 98% +

Guanosine Arabinoside
araGuanosine (*N-iBu*) CEP



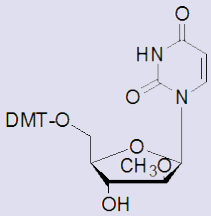
$C_{46}H_{56}N_7O_{10}P$
Mol. Wt.: 897.95

Catalog#
ANP-1713

Pricing
$160.00 / 100 µmole
$350.00 / 250 mg

Purity: 99% +

Uridine Arabinoside
araUridine CEP



$C_{31}H_{32}N_2O_8$
Mol. Wt.: 560.59

Catalog#
ANP-1715

Pricing
$155.00 / 100 µmole
$345.00 / 250 mg

Purity: 98% +

AraC phosphoramidite was synthesized and incorporated into synthetic oligonucleotides in order to study duplex stability. *(P. Beardsley, T. Mikita, M. M. Klause, A. L. Nussbaum, Nucl. Acids Res., 16, 9165, 1988)*.
AraC nucleoside is a potent antileukemic agent as well as an inhibitor of DNA replication, through a mechanism which is not yet fully understood *(P. P. Major et al., Proc. Natl. Acad. Sci. USA, 78, 3235, 1981)*.

Arabinoside Icaa Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-7366-05	araAdenosine (*N*-Bz)	500Å	$65	$500	$88	$112	$176	$224
N-7366-10	3'-Icaa CPG	1000Å						
N-7367-05	araCytidine (*N*-Bz)	500Å	$65	$500	$88	$112	$176	$224
N-7367-10	3'-Icaa CPG	1000Å						
N-7421-05	araGuanosine (N-iBu)	500Å	$65	$500	$88	$112	$176	$224
N-7421-10	3'-Icaa CPG	1000Å						
N-7422-05	araUridine	500Å	$65	$500	$88	$112	$176	$224
N-7422-10	3'-Icaa CPG	1000Å						

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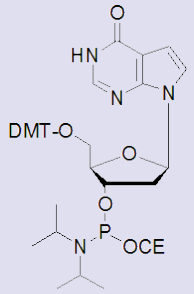
7-Deaza deoxy Inosine CEP



$C_{41}H_{48}N_5O_7P$
Mol. Wt.: 753.82

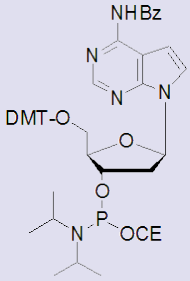
Catalog#
ANP-1146

Pricing
$150.00 / 50 µmole
$270.00 / 100 µmole
$675.00 / 250 mg

Purity: 98% +

7-Deaza deoxy Adenosine CEP

(7-Deaza deoxy Adenosine (*N-Bz*) CEP)



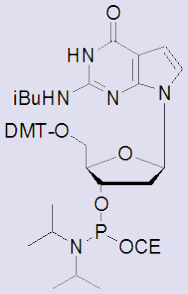
$C_{48}H_{53}N_6O_7P$
Mol. Wt.: 856.94

Catalog#
ANP-4815

Pricing
$150.00 / 50 µmole
$270.00 / 100 µmole
$675.00 / 250 mg

Purity: 98% +

7-Deaza deoxy (N-iBu) Guanosine CEP



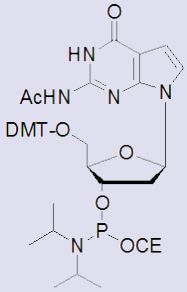
$C_{45}H_{55}N_6O_8P$
Mol. Wt.: 838.93

Catalog#
ANP-4857

Pricing
$150.00 / 50 µmole
$270.00 / 100 µmole
$675.00 / 250 mg

Purity: 98% +

7-Deaza deoxy (N-Ac) Guanosine CEP



$C_{43}H_{51}N_6O_8P$
Mol. Wt.: 810.87

Catalog#
ANP-4858

Pricing
$150.00 / 50 µmole
$270.00 / 100 µmole
$675.00 / 250 mg

Purity: 98% +

7-Deaza 3'-Succinyl Icaa Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-8777-05 N-8777-10	7-Deaza deoxy Adenosine (*N*-Bz) -3'-Icaa CPG	500Å 1000Å	$90	$750	$110	$145	$220	$290
N-8778-05 N-8778-10	7-Deaza deoxy Guanosine (N-iBu) -3'-Icaa CPG	500Å 1000Å	$90	$750	$110	$145	$220	$290
N-8779-05 N-8779-10	7-Deaza deoxy Inosine -3'-Icaa CPG	500Å 1000Å	$90	$750	$110	$145	$220	$290

7-Deaza 2'-deoxy Adenosine (2'-deoxytubercidin), Guanosine, and Inosine

These analogs of natural deoxy Inosine, deoxy Adenosine, and deoxy Guanosine have found great interest among molecular biologists for the purpose of localizing DNA-enzyme interactions *(F. Seela, H. Driller, Nucl. Acids Res., 13, 911, 1985)* and facilitating DNA sequencing using M13 chain-termination methodology *(S. Mizusawa, S. Nishimura, F. Seela, Nucl. Acids Res., 14, 1315, 1986)*. The oligonucleotide containing these bases have reduced band compression which occurs due to strong GC base pairing. The high stability of the oligomers containing these bases and their possible application in MALDI mass spectrometry *(K. Schneider, B. T. Chait, Nucl. Acids Res., 23. 1570, 1995)* allows for these substances to play a key role in DNA sequencing.
The 7-deaza bases are related to 2'-deoxyadenosine, 2'-deoxyguanosine and form stable base pairs in duplex DNA. (*F.Seela & H.Winter, Helv. Chim. Acta., 1994, 77, 597; F. Seela & H. Winter, Helv. Chim. Acta., 1998, 81, 2244.)*

For Corrosponding ribo 7-Deaza Amidites see page 69.
For Corrosponding 7-Deaza-2'-O-methyl amidites see page 103.

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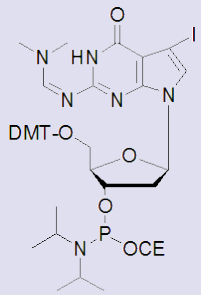
Oligo Synthesis Products

Phosphoramidites and Supports for Modified DNA Synthesis

5'-DMT-7-Deaza-7-Iodo deoxy Guanosine CEP
(5'-DMT-7-Deaza-7-Iodo deoxy Guanosine (*N,N-DMF*) CEP)



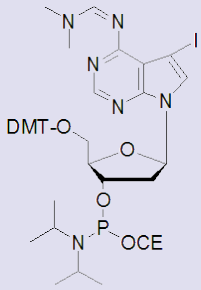
$C_{44}H_{53}IN_7O_7P$
Mol. Wt.: 949.81

Catalog#
ANP-4589

Pricing
$225.00 / 50 µmole
$405.00 / 100 µmole

Purity: 98% +

5'-DMT-7-Deaza-7-Iodo deoxy Adenosine CEP
(5'-DMT-7-Deaza-7-Iodo deoxy Adenosine (*N,N-DMF*) CEP)



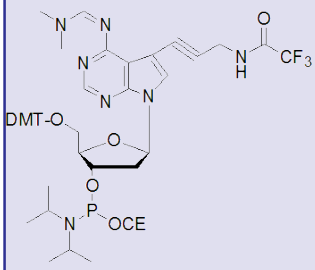
$C_{44}H_{53}IN_7O_6P$
Mol. Wt.: 933.81

Catalog#
ANP-4586

Pricing
$225.00 / 50 µmole
$405.00 / 100 µmole

Purity: 98% +

7-Deaza deoxy Adenosine (N,N-DMF) 7-Propargyl Amino TFA CEP



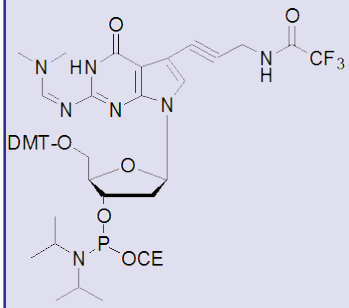
$C_{49}H_{56}F_3N_8O_7P$
Mol. Wt.: 956.99

Catalog#
ANP-1339

Pricing
$265.00 / 50 µmole
$360.00 / 100 µmole

Purity: 98% +

7-Deaza deoxy Guanosine (N,N-DMF) 7-Propargyl Amino TFA CEP



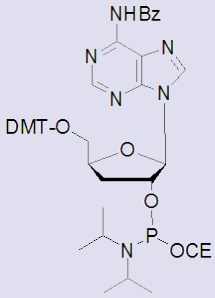
$C_{49}H_{56}F_3N_8O_8P$
Mol. Wt.: 972.99

Catalog#
ANP-1354

Pricing
$265.00 / 50 µmole
$475.00 / 100 µmole

Purity: 98% +

3' deoxy Adenosine (N-Bz) CEP
(Cordycepin)



$C_{47}H_{52}N_7O_7P$
Mol. Wt.: 857.93

Catalog#
ANP-9312

Pricing
$385.00 / 100 µmole

Purity: 98% +

3'-dA Icaa Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-9502-05	3' deoxy Adnosine (*N*-Bz)	500Å	$295	$200	$400	$400	$800
N-9502-10	3'-Icaa CPG (Cordycepin)	1000Å					

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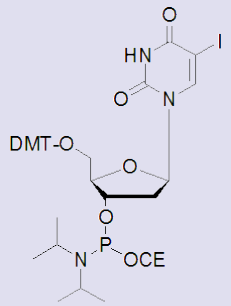
5-Iodo deoxy Uridine CEP



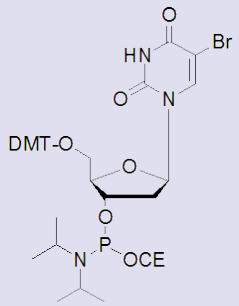
$C_{39}H_{46}IN_4O_8P$
Mol. Wt.: 856.68

Catalog#
ANP-4611

Pricing
$ 55.00 / 100 µmole
$150.00 / 250 mg
$275.00 / 500 mg

Purity: 98% +

5-Bromo deoxy Uridine CEP



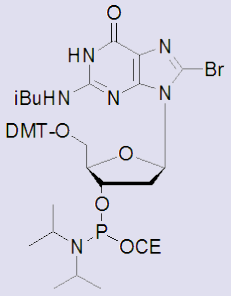
$C_{39}H_{46}BrN_4O_8P$
Mol. Wt.: 809.68

Catalog#
ANP-6415

Pricing
$ 50.00 / 100 µmole
$150.00 / 250 mg
$275.00 / 500 mg

Purity: 98% +

8-Bromo deoxy Guanosine (N-iBu) CEP



$C_{44}H_{53}BrN_7O_8P$
Mol. Wt.: 918.81

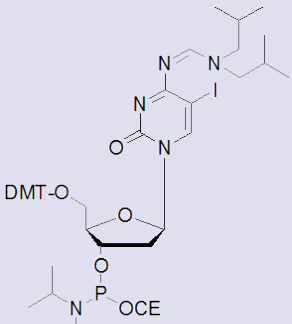
Catalog#
ANP-6152

Pricing
$ 95.00 / 100 µmole
$195.00 / 250 mg
$330.00 / 500 mg

Purity: 98% +

5-Iodo deoxy Cytidine (N,N-DIBF) CEP

(5-Iodo deoxy Cytidine (N,N-diisobutylformamidine) CEP)



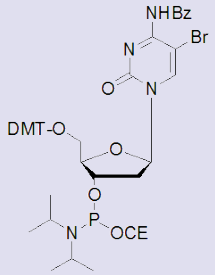
$C_{48}H_{60}IN_6O_8P$
Mol. Wt.: 1022.90

Catalog#
ANP-4591

Pricing
$110.00 / 100 µmole
$300.00 / 250 mg
$585.00 / 500 mg

Purity: 98% +

5-Bromo deoxy Cytidine (N-Bz) CEP



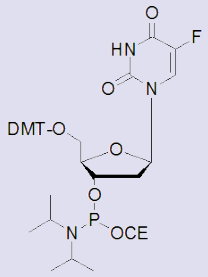
$C_{46}H_{51}BrN_5O_8P$
Mol. Wt.: 912.80

Catalog#
ANP-6141

Pricing
$ 50.00 / 100 µmole
$150.00 / 250 mg
$275.00 / 500 mg

Purity: 98% +

5-Fluoro deoxy Uridine 5'-CEP



$C_{39}H_{46}FN_4O_8P$
Mol. Wt.: 748.78

Catalog#
ANP-6151

Pricing
$125.00 / 100 µmole
$350.00 / 250 mg
$680.00 / 500 mg

Purity: 98% +

C-8 Substituted Purine and C-5 Halogen Substituted Pyrimidines:

The bromo in Adenosine and Guanosine, at the C-8 position, is photolabile in nature. The 8-Bromo deoxy Adenosine phosphoramidite has been incorporated into synthetic DNA as a means to create a site which can be photo-activated after duplex formation.

Such DNA or RNA probes containing 8-Bromo Adenosine or Guanosine could thus be useful to determine specific contact in protein-DNA complexes *(J. Liu, G. L. Verdine, Tet. Letters, 33, 4265, 1992).*

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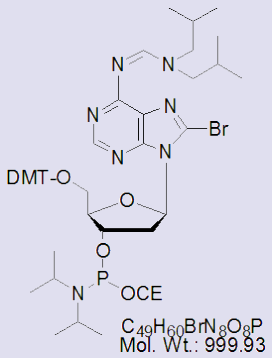
8-Bromo deoxy Adenosine (N,N-DIBF) CEP

(8-Bromo deoxy Adenosine (N,N-diisobutylformamidine) CEP)



Catalog#

ANP-4702

Pricing

$120.00 / 100 µmole

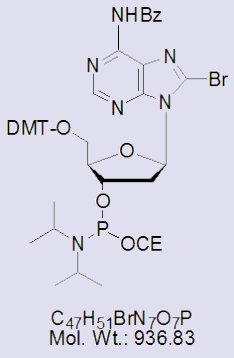
$300.00 / 250 mg

Purity: 98% +

Deprotection of isobudmf protected 5'-DMT-8-Bromo deoxy Adenosine takes 2-3 hours at 37°C with ammonia deprotection of oligo. This group is compatabile with PAC Chemistry.

8-Bromo deoxy Adenosine (N-Bz) CEP

(8-Bromo deoxy Adenosine (*N-Bz*) CEP)



Catalog#

ANP-4703

Pricing

$120.00 / 100 µmole

$300.00 / 250 mg

Purity: 98% +

Deprotection of bz protected 8-Bromo deoxy Adenosine takes 7-8 hours at 37°C with ammonia deprotection of oligo. This system is compatabile with Standard base protection Chemistry.

Halogenated Purines & Pyrimidines Supports And Columns

			Bulk CPG		pack of 4 cols.		pack of 10 cols.	
Catalog #	Product Name	Pore Size	100 mg	1 gm	0.2 µmole	1.0 µmole	0.2 µmole	1.0 µmole
N-1378-05 N-1378-10	5-Bromo deoxy Uridine 3'-Icaa CPG	500Å 1000Å	$50	$175	$95	$145	$190	$290
N-7362-05 N-7362-10	5-Bromo deoxy Cytidine (*N*-Bz) 3'-Icaa CPG	500Å 1000Å	$50	$175	$95	$145	$190	$290
N-7363-05 N-7363-10	5-Iodo deoxy Cytidine (*N,N*-DIBF) 3'-Icaa CPG	500Å 1000Å	$65	$260	$105	$160	$210	$320
N-7364-05 N-7364-10	5-Iodo deoxy Uridine 3'-Icaa CPG	500Å 1000Å	$65	$260	$105	$160	$210	$320
N-7365-05 N-7365-10	5-Fluoro deoxy Uridine 3'-Icaa CPG	500Å 1000Å	$65	$265	$105	$160	$210	$320
N-9921-05 N-9921-10	8-Bromo deoxy Guanosine (*N*-iBu) 3'-Icaa CPG	500Å 1000Å	$115	$430	$110	$180	$220	$360
N-4704-05 N-4704-10	8-Bromo deoxy Adenosine (*N,N*-DIBF) 3'-Icaa CPG	500Å 1000Å	$110	$420	$105	$175	$210	$350
N-4705-05 N-4705-10	8-Bromo deoxy Adenosine (*N*-Bz) 3'-Icaa CPG	500Å 1000Å	$110	$420	$105	$175	$210	$350

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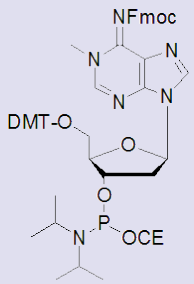
N^1-Methyl deoxy Adenosine CEP

(N^1-Methyl deoxy Adenosine (N-Fmoc) CEP)



$C_{56}H_{60}N_7O_8P$
Mol. Wt.: 990.09

Catalog#

ANP-6121

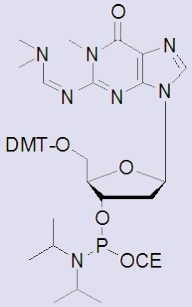
Pricing

$126.50 / 100 µmole
$286.00 / 250 mg

Purity: 98% +

N^1-Methyl deoxy Guanosine CEP

(N^1-Methyl deoxy Guanosine (*N,N-DMF*) CEP)



$C_{44}H_{55}N_8O_7P$
Mol. Wt.: 838.93

Catalog#

ANP-6122

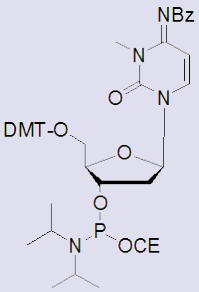
Pricing

$126.50 / 100 µmole
$286.00 / 250 mg

Purity: 98% +

N^3-Methyl deoxy Cytidine CEP

(N^3-Methyl deoxy Cytidine (*N-Bz*) CEP)



$C_{47}H_{54}N_5O_8P$
Mol. Wt.: 847.93

Catalog#

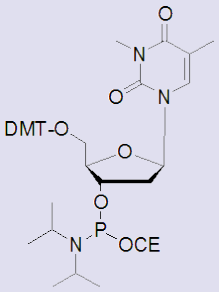
ANP-3851

Pricing

$225.00 / 100 µmole
$450.00 / 250 mg

Purity: 98% +

N^3-Methyl Thymidine CEP



$C_{41}H_{51}N_4O_8P$
Mol. Wt.: 758.84

Catalog#

ANP-6153

Pricing

$126.50 / 100 µmole
$286.00 / 250 mg

Purity: 98% +

N-Alkylated phosphoramidites

DNA in living organisms is vulnerable to alkylation due to mutagenic effects of carcinogens. Recently it has been shown that there is direct reversal of n-alkylation of methylated bases in oligonucleotides. A recent discovery of an enzyme which is a substrate for DNA repair *(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)*, has great implication for repair of such carcinogenic and mutagenic events.

N-alkylated nucleosides and the oligonucleotides incorporating methylated bases at specific sites in oligonucleotides possess great potential for studies of reversal of alkylation in oligonucleotides and studies in oxidative alkylation inside cells by various carcinogens.

ChemGenes is offering the phosphoramidites for studies and possibilities of reversal of methylation lesions by use of oligonucleotides incorporating alkylated purine/pyrimidines.

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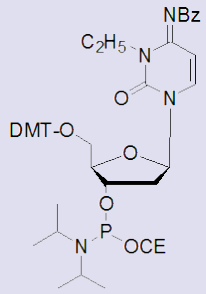
Oligo Synthesis Products

Phosphoramidites and Supports for Modified DNA Synthesis

N^3-Ethyl deoxy (N-Bz) Cytidine CEP



$C_{48}H_{56}N_5O_8P$
Mol. Wt.: 861.96

Catalog#

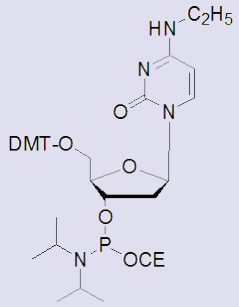
ANP-3856

Pricing

$225.00 / 100 µmole
$450.00 / 250 mg

Purity: 98% +

N^4-Ethyl deoxy Cytidine CEP



$C_{41}H_{52}N_5O_7P$
Mol. Wt.: 757.85

Catalog#

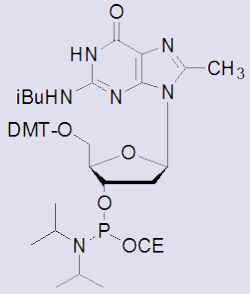
ANP-6444

Pricing

$190.00 / 100 µmole
$550.00 / 250 mg

Purity: 98% +

8-Methyl deoxy Guanosine (N-iBu) CEP



$C_{45}H_{56}N_7O_8P$
Mol. Wt.: 853.94

Catalog#

ANP-9274

Pricing

$275.00 / 100 µmole
$640.00 / 250 mg

Purity: 99% +

8- Methyl deoxy Guanosine Phosphoramidites

ChemGenes now ofers the 8 methyl dG and 8-methyl rG amidites for incorporation in deoxy and ribo oligonucleotides to study and engineer the conformation and stability of oligos. 8-methyl dG containing oligonucleotides have been shown to conform remarkable stability to Z-conformation of DNA. Similiarly 8-methyl dG containing oligonucleotides have been shown to cause a conformational and helical switch to left handed oligonucleotides

1.Sugiyama, H., Kawai, K., Matsunaga, A., Fujimoto, K., Saito, I., Robinson, H., Wang, A.H., Nucl. Acids Res., 24, 7, 1272-1278, 1996.
2.Cherrak, I., Mauffret,O., Santamaria,F., Hocquet,A., Ghomi, B., Rayner,B., Fermandjian, S., Nucl.Acids es., 31, 23, 6986-6995, 2003.

N-Alkylated 3'-Succinyl Icaa Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-9980-05 N-9980-10	N^1-Methyl deoxy Adenosine (*N*-Fmoc) 3'-Icaa CPG	500Å 1000Å	$125	$970	$90	$125	$180	$250
N-9981-05 N-9981-10	N^1-Methyl deoxy Guanosine (*N,N*-DMF) 3'-Icaa CPG	500Å 1000Å	$125	$970	$90	$125	$180	$250
N-9922-05 N-9922-10	N^3-Methyl Thymidine 3'-Icaa CPG	500Å 1000Å	$125	$970	$90	$125	$180	$250
N-9923-05 N-9923-10	N^4-Ethyl deoxy Cytidine 3'-Icaa CPG	500Å 1000Å	$125	$970	$80	$120	$160	$240
N-9924-05 N-9924-10	8-Methyl deoxy Guanosine 3'-Icaa CPG	500Å 1000Å	$125	$970	$80	$125	$160	$240

N4-Ethyldeoxy Cytidine phosphoramidite: N4-Ethyl dC hybridizes selectively with natural dG to give G:4EtC base pair *(H.Nguyen and E.M.Southern, Nucleic Acids Research, 2000, 28, 3904-3909).*

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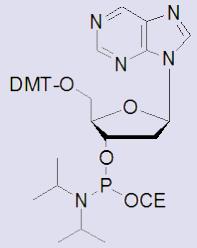
Nebularine

(deoxy Purine CEP)



$C_{40}H_{47}N_6O_6P$
Mol. Wt.: 738.81

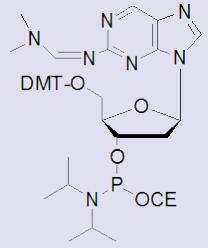
Catalog#
ANP-7601

Pricing
$ 95.00 / 100 µmole
$240.00 / 250 mg

Purity: 98% +

2-Amino deoxy Purine CEP

(2-Amino Purine-2'-deoxyriboside (N,N-DMF) CEP)



$C_{43}H_{53}N_8O_6P$
Mol. Wt.: 808.91

Catalog#
ANP-9315-2

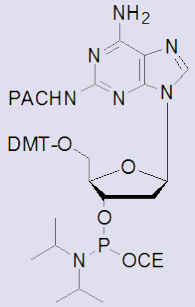
Pricing
$110.00 / 100 µmole

Purity: 98% +

ANP-9315 with *N-iBu* protection has been discontinued.

2-Amino deoxy Adenosine (2,6-diaminopurine) CEP

(2-amino deoxy Adenosine (*N-PAC*) CEP)



$C_{48}H_{55}N_8O_8P$
Mol. Wt.: 902.97

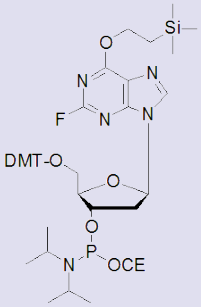
Catalog#
ANP-9316

Pricing
$335.00 / 100 µmole

Purity: 98% +

2-Fluoro deoxy Inosine CEP (O^6-trimethyl silyl ethoxy)

(For post synthetic modification of Guanosine-carbon-2)



$C_{45}H_{58}FN_6O_7PSi$
Mol. Wt.: 873.04

Catalog#
ANP-7702

Pricing
$180.00 / 100 µmole
$525.00 / 250 mg

Purity: 98% +

3'-Succinyl Icaa Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-9511-05 N-9511-10	2-Amino deoxy Purine (*N,N*-DMF) 3'-Icaa CPG	500Å 1000Å	$110	$650	$80	$120	$160	$240
N-9503-05 N-9503-10	Nebularine (deoxy Purine) 3'-Icaa CPG	500Å 1000Å	$110	$750	$120	$140	$240	$280
N-9512-05 N-9512-10	2-Amino deoxy Adenosine (*N*-PAC) 3'-Icaa CPG	500Å 1000Å	$110	$700	$90	$120	$180	$240
N-9926-05 N-9926-10	2-Fluoro deoxy Inosine (O6-tert-butyl-silyl ethoxy) 3'-Icaa CPG	500Å 1000Å	$125	$970	$100	$150	$200	$300

Please Indicate Synthesizer when Ordering

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AB30	AB39	EX	MR	PX

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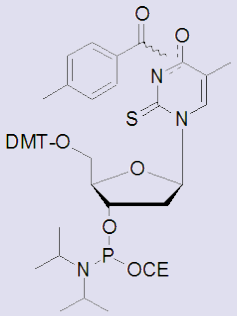
2-Thio Thymidine CEP



Catalog#

ANP-9213

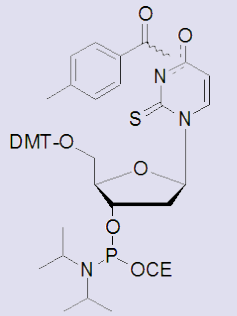
Pricing

$280.00 / 100 µmole

$655.00 / 250 mg

Purity: 98% +

2-Thio deoxy Uridine CEP



Catalog#

ANP-9214

Pricing

$290.00 / 100 µmole

$670.00 / 250 mg

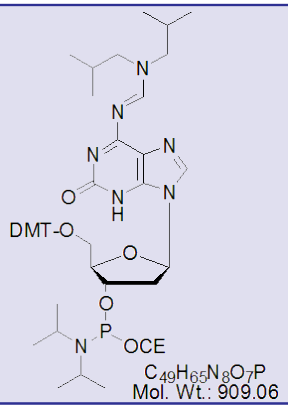
Purity: 98% +

2 Thio 3'-Succinyl Icaa Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-9509-05	2-Thio deoxy Thymidine	500Å	$110	$810	$125	$155	$250	$310
N-9509-10	3'-Icaa CPG	1000Å						
N-9510-05	2-Thio deoxy Uridine	500Å	$125	$900	$135	$170	$270	$340
N-9510-10	3'-Icaa CPG	1000Å						

deoxy isoGuanosine CEP

(deoxy isoGuanosine (*N,N*-diisobutylformamidine) CEP)



Catalog#

ANP-4268

Pricing

$300.00 / 100 µmole

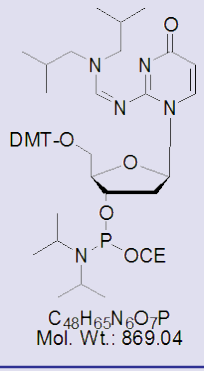
$750.00 / 250 mg

Purity: 98% +

Deprotection of diisobutyl-Formamidine protected 2'-deoxy isoGuanosine takes 4-5 hours at 37ºC with ammonia deprotection of oligo.

deoxy isoCytidine CEP

(deoxy isoCytidine (*N,N*-diisobutylformamidine) CEP)



Catalog#

ANP-4269

Pricing

$300.00 / 100 µmole

$750.00 / 250 mg

Purity: 98% +

IsoG & IsoC 3'-Succinyl Icaa Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-9929-05	deoxy iso-Cytidine 3'-Icaa CPG	500Å	$125	$970	$110	$175	$220	$350
N-9929-10	(*N,N*-DIBF)-3'-Icaa CPG	1000Å						
N-9927-05	deoxy iso-Guanosine	500Å	$125	$970	$110	$175	$220	$350
N-9927-10	(*N,N*-DIBF)- 3'-Icaa CPG	1000Å						

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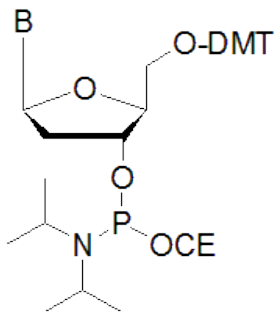

β-L-DNA Synthesis Reagents

5'	B	Protection	Catalog#
O-DMT	A	*N*-Bz	ANP-8031
O-DMT	C	*N*-Bz	ANP-8032
O-DMT	G	*N*-iBu	ANP-8033
O-DMT	T	n/a	ANP-8034
O-DMT	C	*N*-Ac	ANP-8035

Catalog #	Product Name	100mg	500mg	1gm	2gm	5gm
ANP-8031	β-L-deoxy Adenosine (*N*-Bz) 3'-CEP, *M.W. 857.92*	$140	$275	$505	$ 927	$2,125
ANP-8032	β-L-deoxy Cytidine (*N*-Bz) 3'-CEP, *M.W. 833.89*	$140	$275	$505	$ 927	$2,125
ANP-8033	β-L-deoxy Guanosine (*N*-iBu) CEP, *M.W. 839.90*	$155	$295	$530	$ 973	$2,233
ANP-8034	β-L-Thymidine 3'-CEP, *M.W. 744.80*	$150	$290	$525	$ 963	$2,223
ANP-8035	β-L-deoxy Cytidine (*N*-Ac) 3'-CEP, *M.W. 771.84*	$150	$305	$565	$1,037	$2,380

Mirror Image of Natural DNA, (ß-L-Deoxy Nucleoside Phosphoramidites) For The Synthesis of L-DNA

- β-L-deoxyribonucleoside polymers do not form double strands with complementary strands. (*Ulysse Aseline, et. al., N.A.R. 19, 15 4067-4074 1991*).
- β-L-deoxyribonucleosides have high resistance to digestion by various nucleases.
- Synthetic 56-nucleotide β-L-DNA bind with Vasopressin and is an antagonist of Vasopressin. *(K. P. Williams et. al., PNAS, USA, 94, 11285-11290, 1997)*.
- β-L-deoxyribonucleosides are being developed to bind with great specificity to antibodies and small biologically active molecules.
- β-L-DNA attached to primers for microarray design (Fig.1).
- β-L-DNA attached molecular beacons for site specific binding (Fig. 2).

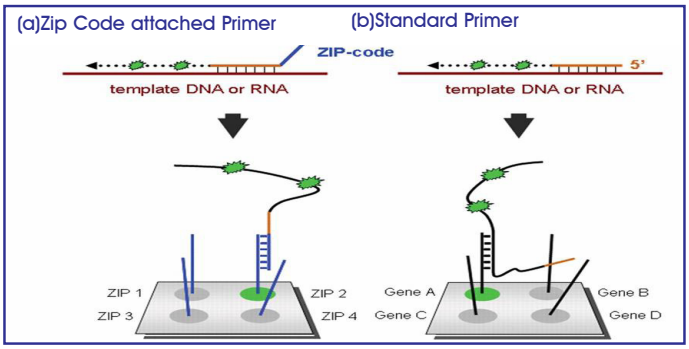

Fig1. Template Specfic Primer Extension & Labelling Illustration of advantages of L-DNA (Zip Code) attached Primers for PCR and Microarray (Nucleic Acids Research; 2007, Vol. 35,No.21,7279-7287) Reproducid by the kind permission of Oxford Press, UK

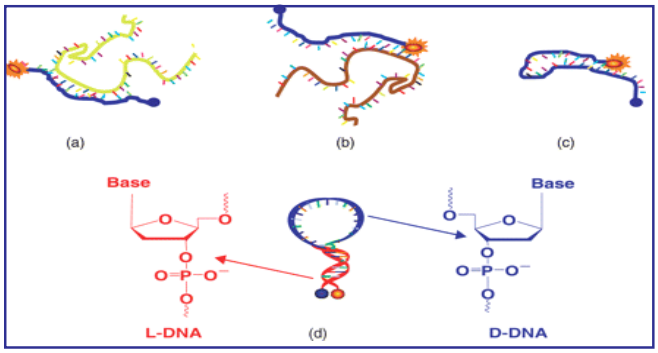

Fig2. Application of L-DNA attached molecular beacons (MB) avoiding non-specific binding (a-c). Design of Universal Microarray Platform. (Nucleic Acids Research; 2006, Vol. 34,No.18,5101-5111) Reproduced by the kind permission of Oxford Press, UK

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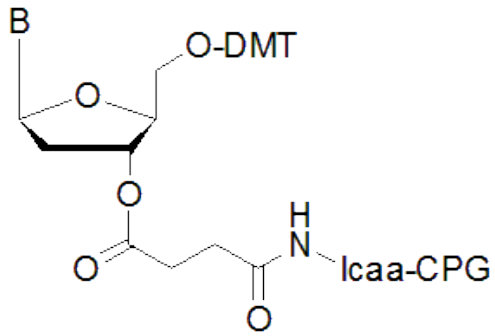
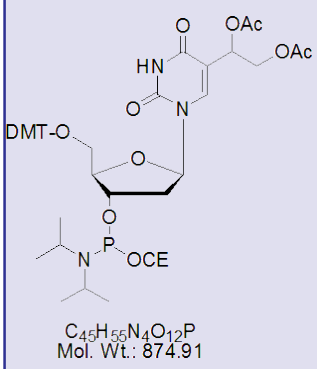


β-L-DNA Icaa Supports & Columns

5'	B	Protection	Catalog #
O-DMT	A	*N*-Bz	N-3521
O-DMT	C	*N*-Bz	N-3522
O-DMT	G	*N*-iBu	N-3523
O-DMT	T	n/a	N-3524
O-DMT	C	*N*-Ac	N-3525

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	500 mg	1 gm	pack of 4 cols. 0.2 µmole	1.0 µmole	pack of 10 cols. 0.2 µmole	1.0 µmole
N-3521-05 N-3521-10	ß-L-deoxy Adenosine (*N*-Bz) 3'-Icaa CPG	500Å 1000Å	$125	$290	$465	$120	$240	$240	$480
N-3522-05 N-3522-10	ß-L-deoxy Cytidine (*N*-Bz) 3'-Icaa CPG	500Å 1000Å	$125	$290	$465	$120	$240	$240	$480
N-3523-05 N-3523-10	ß-L-deoxy Guanosine (*N*-iBu) 3'-Icaa CPG	500Å 1000Å	$125	$290	$465	$120	$240	$240	$480
N-3524-05 N-3524-10	ß-L-Thymidine 3'-Icaa CPG	500Å 1000Å	$125	$290	$465	$120	$240	$240	$480
N-3525-05 N-3525-10	ß-L-deoxy Cytidine (*N*-Ac) 3'-Icaa CPG	500Å 1000Å	$125	$290	$465	$120	$240	$240	$480

5'-DMT-5-formyl (diacetyl)-2'-deoxyuridine-3'-CEP



Catalog#

ANP-6067

Pricing

$275.00 / 100 µmole

$640.00 / 250 mg

Purity: 99% +

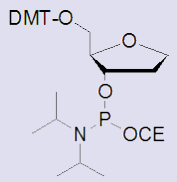
5- Formyl Uridine phosphoramidite

It has been shown that 5-Formyl-2'-deoxy uridine is formed in DNA as a result of ionization radiation and several means such as gamma-ray irradiation and other oxidative damages[1,2]. The damaged DNA, due to formation of 5-formyl uracil, causes mutagenises. We now offer the 5-formyl dU-phosphoramidite for synthesis of DNA and modifications for the study and evaluation of various roles it plays and for diagnostic applications.

1. Bjelland,S., Eide,L.,Time, R.W., Store,R., Eftedal,I., Volden,G., Seeberg,E., Biochemistry, 34,14758-14764,1995.
2. H. Sugiyama, S. Matsuda, K. Kino, Q-M. Zhang, S. Yonei and ,I.Saito., Tet. Lett.,37,50,9067-9070,1996.

Abasic Phosphoramidite

(1,2-dideoxy D-ribose CEP)



$C_{35}H_{45}N_2O_6P$
Mol. Wt.: 620.72

Catalog#

ANP-7058

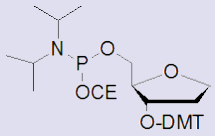
Pricing

$85.00 / 100 µmole
$300.00 / 250 mg

Purity: 98% +

Reverse Abasic Phosporamidites

(1,2-dideoxy D-ribose 3'-DMT-5'-CEP)



$C_{35}H_{45}N_2O_6P$
Mol. Wt.: 620.72

Catalog#

ANP-1422

Pricing

$125.00 / 100 µmole
$425.00 / 250 mg

Purity: 98% +

Abasic Site

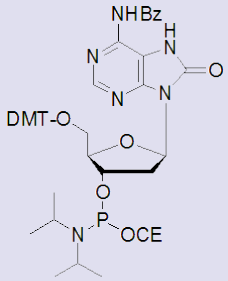
Oligonucleotides containing the chemically stable isostructural tetrahydrofuran analog of an abasic site are important reagents for studies related to depurination of oligonucleotides, which occurs quite frequently within the cell. For a good publication regarding T_M values etc., see (I. Pompizi, A. Haberli , C.J.Leumann, Nucleic Acids Research, 2000, 28, 2702-2708), (*Ulysse Aseline, et. al., N.A.R. 19, 15 4067-4074 1991)*.

Abasic Succinyl Icaa Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-1423-05	1,2-dideoxy D-ribose	500Å	$210	$170	$215	$340	$430
N-1423-10	5-*O*-DMT-3-Icaa CPG	1000Å					
N-1424-05	1,2-dideoxy D-ribose	500Å	$290	$210	$300	$420	$600
N-1424-10	3-*O*-DMT-5-Icaa CPG	1000Å					

8-Oxo deoxy Adenosine CEP

(8-Oxo deoxy Adenosine *(N-Bz)* CEP)



$C_{47}H_{52}N_7O_8P$
Mol. Wt.: 873.93

Catalog#

ANP-9301

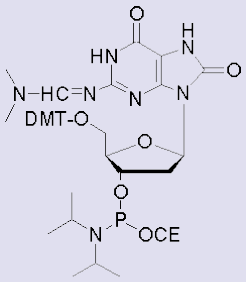
Pricing

$130.00 / 100 µmole
$345.00 / 250 mg

Purity: 98% +

8-Oxo deoxy Guanosine CEP*** NEW!

(8-Oxo deoxy Guanosine (N,N-DMF) CEP



$C_{43}H_{53}N_8O_8P$
Mol. Wt.: 840.90

Catalog#

ANP-9311-2

Pricing

$285.00 / 100 µmole
$800.00 / 250 mg

Purity: 99% +

3'-Succinyl Icaa Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-5300-05	8-Oxo deoxy Adenosine	500Å	$110	$780	$120	$145	$240	$290
N-5300-10	(*N*-Bz) 3'-Icaa CPG	1000Å						
N-9501-05	8-Oxo deoxy Guanosine	500Å	$125	$900	$135	$170	$270	$340
N-9501-10	(*N,N*-DMF) 3'-Icaa CPG	1000Å						

*** ANP-9311 With N-iBu protection has been discontinue

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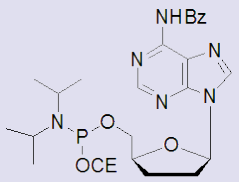
Oligo Synthesis Products

Phosphoramidites and Supports for Modified DNA Synthesis

2',3'-dideoxy Adenosine (N-Bz) 5'-CEP



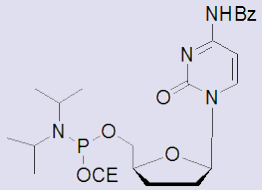
$C_{26}H_{34}N_7O_4P$
Mol. Wt.: 539.57

Catalog#
DDN-7051

Pricing
$130.00 / 100 µmole
$540.00 / 250 mg

Purity: 98% +

2',3'-dideoxy Cytidine (N-Bz) 5'-CEP



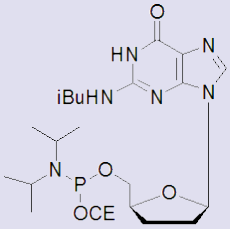
$C_{25}H_{34}N_5O_5P$
Mol. Wt.: 515.54

Catalog#
DDN-7052

Pricing
$130.00 / 100 µmole
$540.00 / 250 mg

Purity: 98% +

2',3'-dideoxy Guanosine (N-iBu) 5'-CEP



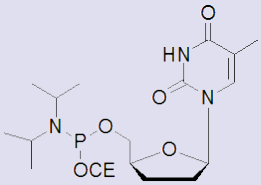
$C_{23}H_{36}N_7O_5P$
Mol. Wt.: 521.55

Catalog#
DDN-7053

Pricing
$130.00 / 100 µmole
$540.00 / 250 mg

Purity: 98% +

2',3'-dideoxy Thymidine 5'-CEP



$C_{19}H_{31}N_4O_5P$
Mol. Wt.: 426.45

Catalog#
DDN-7054

Pricing
$130.00 / 100 µmole
$540.00 / 250 mg

Purity: 98% +

Dideoxy Succinyl Icaa Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	pack of 4 cols. 0.2 µmole	pack of 10 cols. 0.2 µmole
N-7368-05	2',3'-dideoxy Adenosine (N-succinyl - Icaa CPG)	500Å	$250	$1,500	$180	$250
N-7369-05	2',3'-dideoxy Cytidine (N-succinyl - Icaa CPG)	500Å	$250	$1,500	$180	$240

Please Indicate Synthesizer when Ordering

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

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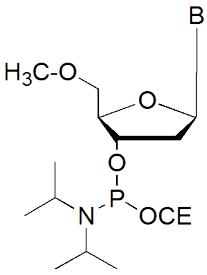


5'-O-Methyl DNA Phosphoramidites

B	Protection	Catalog#
A	*N*-Bz	ANP-5511
C	*N*-Bz	ANP-5512
G	*N*-iBu	ANP-5513
T	n/a	ANP-5514

Catalog #	Product Name	100μmole	250mg	500mg
ANP-5511	5'-O-Methyl deoxy-Adenosine (*N*-Bz) 3'-CEP, *M.W. 569.6*	$150	$290	$495
ANP-5512	5'-O-Methyl deoxy-Cytidine (*N*-Bz) 3'-CEP, *M.W. 545.6*	$150	$290	$495
ANP-5513	5'-O-Methyl deoxy-Guanosine (*N*-iBu) CEP, *M.W. 551.58*	$155	$295	$495
ANP-5514	5'-O-Methyl deoxy-Thymidine 3'-CEP, *M.W. 456.47*	$140	$275	$495

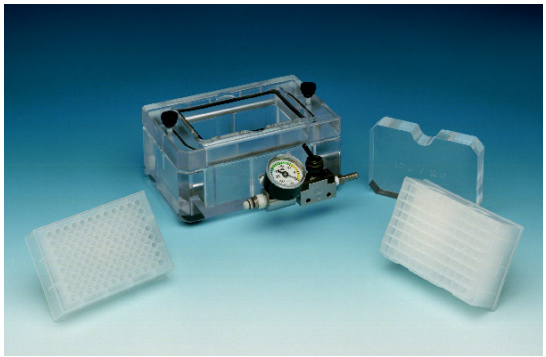
Please Indicate Synthesizer when Ordering

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

DNA PURIFICATION

ChemGenes now offers the GENE-SYS 1 solid phase DMT-ON purification/extraction 96 well micropurifier to enable parallel purification of synthetic oligonucleotides for 5 OD (260nm) to 50 OD (260 nm) quantities. The 96 position GENE-SYS 1 accomodates the polypropylene 0.7 mL/well, 1.2 mL/well, 1.25 mL/well, and 2.25mL/ well removable well filter plates. The system charges crude oligos followed by washing and elution without a cumbersome valve network.

Catalog#	Product Name	Prices
GS-3249	Puri-Pak Plate™	$ 280
GS-1154	GeneSys-12 (Not Shown)	$ 550
GS-1158	GeneSys-24 (Not Shown)	$ 805
GS-8366	GeneSys Manifold for 96-Well Format GeneSys-1	$1,280
GS-3280	96 Well Collection plate	$ 15
GS-3280	96 Well Collection plate (Pack of 12)	$ 162
GS-8361	96 Well Oligonucleotide Synthesis Plate	$ 25



GeneSys-12 (catalog #GS-1154) purifies up to 12 oligos at the same time.
GeneSys-24 (catalog #GS-1158) purifies up to 24 oligos at the same time.

Puri-Pak Plate™ (catalog #3249) is a 96-Well purification extraction plate. Each well is filled with a unique packing material for oligo purication/cleanup. Each well is capable of the following:

- DMT-ON purification of up to 1 µmole scale per well, or
- DMT-OFF desalting of up to 25 OD per well

Genesys Manifold for the 96 Well format comes complete with a gasket for top and bottom collection plates. The system also includes a vacuum controller for low vacuum evacuation of the system for the 96-well solvent, buffer exchange, and dropwise collection of the purified oligo. This system has the advantage of simultaneous purification of large numbers of oligos in a 96-well purification format. The purification of the crude synthetic oligos can be achieved either by desalting of the crude synthetic oligo or by DMT-ON purification protocol of the crude synthetic DNA.

Besides the natural synthetic DNA oligonucleotides, the Puri-Pak Cartridges or the Puri-Pak plate can be used to purify terminal and nucleobase modified oligos, botin, other chromophore labeled oligos, 2'-O-Methyl-oligos, and phosphorothioate labeled oligos.

96-Well collection plates (catalog #3280) have a unique design in which the purification plate fits in effectively in each well for the collection plate and accommodates a 2 ml volume per well.

Puri-Pak Plate™ and Puri-Pak Cartridges™ are trade marks of ChemGenes Corporation.

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Drying Traps

DNA moisture traps are used for maintaining moisture-free environments in oligonucleotide synthesis. The use of these traps will generate super anhydrous conditions for high quality full length DNA/RNA. The traps are available in four different sizes: Small, Medium, Large, and Extra Large. DNA moisture traps are shipped fully activated in vacuum sealed foil packets and are ready for immediate use.

These traps allow highly effective drying of either phosphoramidite solution in acetonitrile, tetrazole solution in acetonitrile (activator solution), or anhydrous acetonitrile (used to make either phosphoramidite solutions or activator solutions).

In addition, the use of these traps in the acetonitrile bottles wash cycle in the DNA synthesizer will maintain a dry environment which results in consistently high coupling in the synthesis per cycle. The traps also restore the usability of "wet" acetonitrile (app. 250 ppm moisture content) by reducing the moisture content below 50 ppm.

Please see the data in the chart below for the selection of your specific application. As the chart indicates a small trap should be used for 10 ml acetonitrile solution and a large trap should be used for 500 ml acetonitrile solution.

Moisture Absorption Efficiency Chart:

Shows the water absorption of the traps of different sizes, as determined by coulometric analysis of acetonitrile spiked with water.

Quantity of Acetonitrile	Amount of Moisture present in "Wet" Solvent	Number of Traps required	Size of Trap	Time required to achieve 35-40 ppm or lower
10-50 ml	180-200 ppm	One	Small	24 Hours
50-100 ml	180-200 ppm	One	Medium	24 Hours
100-1000 ml	180-200 ppm	One	Large	24 Hours
1-4 liters	180-200 ppm	One	Extra Large	24 Hours

Prices

Catalog#	Size	Price for 5	Price for 10
DMT-1975	Small	$32.00	$58.00
DMT-1974	Medium	$34.00	$63.00
DMT-1973	Large	$40.00	$68.00
DMT-1972	Extra Large	$42.00	$78.00

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Puri-Pak Cartridges & Barrels

The **Puri-Pak**™ has been developed by ChemGenes to purify oligonucleotides by DMT-ON method and to desalt oligonucleotides which have been purified by ion-exchange HPLC or Gel Electrophoresis. They are very effective in producing high purity oligonucleotides after synthesis.

The **Puri-Pak cartridges**™ are suitable for the following applications:

- Low scale and also 1.0 µmol scale purification of synthetic oligonucleotides, modified synthetic oligonucleotides carrying amino-terminals, biotin, phosphorothioate oligonucleotides, and 2'-OMe oligonucleotides.
- Desalting of oligonucleotides.

Technical Details

The Puri-Pak columns are designed for efficient and fast purification of DMT-ON oligonucleotides as well as for desalting of oligonucleotides. They are recommended for single use where 25 OD units can be loaded per cartridge. The Puri-Pak columns can also efficiently purify crude oligonucleotides. Also, 5'-DMT-ON oligonucleotides can be separated cleanly from the shorter "fail" sequences.

After NH_3 deprotection of the oligonucleotide, the NH_3 solution containing the dissolved oligo can be loaded directly onto the Puri-Pak column. We recommend washing the crude oligo with Ether prior to removal of the cleaved base protecting groups. The oligo should then be dissolved in either water or 0.1M triethylammonium acetate (1-3ml) and loaded onto the Puri-Pak column.

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DNA Purification & Drying Traps

Catalog#	Product Name	Quantity	Price
CSS-3920-S	Cartidge	1	$ 6.50
CSS-3920-M	Cartidge	5	$ 30.00
CSS-3920-L	Cartidge	10	$ 55.00
CSS-3940-S	Barrel (4 ml)	1	$ 6.50
CSS-3940-M	Barrel (4 ml)	5	$ 30.00
CSS-3940-L	Barrel (4 ml)	10	$ 55.00
CSS-3960-S	Barrel (8 ml)	1	$ 12.00
CSS-3960-M	Barrel (8 ml)	10	$ 95.00
CSS-3960-L	Barrel (8 ml)	50	$450.00

RNA Synthesis

The importance of RNA has long been recognized in cellular processes. A major area of focus is on antisense RNA *(C. Hëléne, J. J. Toulme, Biochim. Biophys. Acta, 99, 1049, 1990)* and the role of catalytic RNA in splicing and ligation *(T. R. Cech, Science, 236, 1532, 1987; Guerrier-Takadac, N. Lumelsky, S. Altman, Science, 246, 1578, 1989)*.

Chemical synthesis of defined sequence RNA is fundamental to develop and understand the role and application of RNA. The enzymatic approach using RNA polymerase is template dependant and therefore, is not a controlled sequence synthesis *(J. F. Milligan, D. R. Groebe, G. W. Witherell, O. C. Uhlenbeck, Nucl. Acids Res., 15, 8783, 1987).*

Chemical synthesis of RNA has been perfected to the extent that long sequences, such as biologically active 76-mer tRNA and multi-milligram quantities can be produced efficiently *(D. Gasparuto, T. Livache, H. Bazin, A. Duplaa, A. Guy, A. Khorlin, D. Molko, A. Roget, R. Teoule, Nucl. Acids Res., 20, 5159, 1992; K. R. Webster, Y. Shamoo, W. Königsberg, E. K. Spicer, Biotechniques, 11, 658,1991)*.

Small Interference RNA

Small interference RNA (siRNA) is one of the key discoveries in the field of RNA application. Short double stranded RNAs (dsRNAs), with a general chain length of 21-23 nts. and having a two nucleotide 3'-end overhang, mediate gene specific suppression of mammalian cells. siRNA guide endonucleolytic cleavage of the target RNA at a single site.

The process is known as RNA interference (RNAi) *(Fire,A.,Xu,S.,Montgomery, M.K., kostas.S.a., Driver,S.E., and Mello,C.C. Nature 391, 806-811 1998)*. The dsRNA direct the degradation of target RNAs complementary to the siRNA sequence *(Zamore ,P., Tuschl,T., Sharp, P., and Bartel, D. Cell 101,25-33, 2000 ; Elbashir, S., Harborth, J.,Weber, K.,and Tuschl, T., Methods Finds. Exp.Clin. Pharmacol. 26, 199-213,2002)*.

The RNAi offers astronomical potentials for understanding and manipulating human diseases at the cellular level. Among the vast and rapidly exploding field of siRNA, some key developments taking place are summarized as: prediction of natural regulatory mechanism in the field of cell biology and functional genomics. This is expected to result in gene based drug discovery. Gene control, gene knock down, and target validation are currently being persued with great vigor by a vast number of researchers worldwide.

Short dsRNA's can be best obtained by Chemical synthesis. ChemGenes specializes in producing the highest purity RNA monomers for studies and further developments in this field.

Use of ethylthio Tetrazole

The use of ethylthio tetrazole has been shown to enhance coupling efficiency to 99.7% *(Marita Wasner, Dominique Arion, Gadi Borkow, Anne Noronha, Andre H. Uddin, Michael A. Parniak and Masad J. Damha, Biochemistry 37, 7478-7486 1998)*.

Please see page 17-25 and 145 for ordering information.

Use of Benzylthio Tetrazole

The use of Benzylthio tetrazole as activator in RNA synthesis has been shown to yet further enhance coupling efficiency.
(Marita Wasner, Dominique Arion, Gadi Borkow, Anne Noronha, Andre H. Uddin, Michael A. Parniak and Masad J. Damha, Biochemistry 37, 7478-7486 1998).

Please see page 17-23 as Ancillary Reagent and page 145 for for bulk quantity supply for ordering information.

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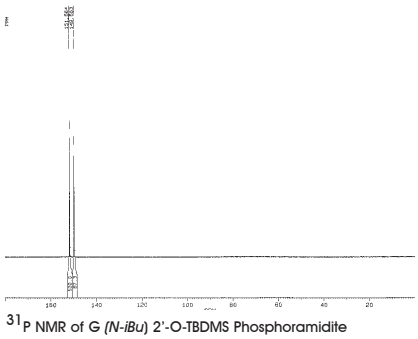
ChemGenes Exhibit 2013 - Page 47

Quality Control Criteria for UltraPure RNA Phosphoramidites

^{31}P NMR

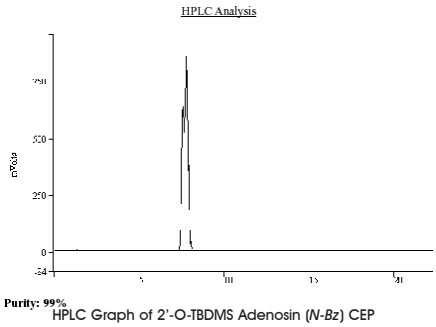
- Single or double peak
- Detection Limit: 0.08%



^{31}P NMR of G (*N-iBu*) 2'-O-TBDMS Phosphoramidite

HPLC

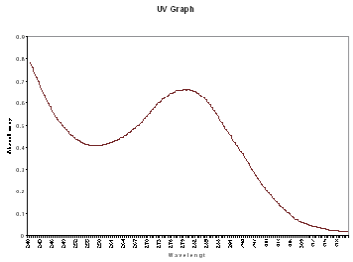
- Single or double peak
- Detection limit: 0.5%

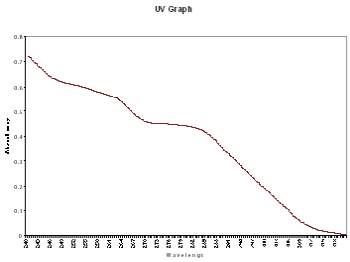


HPLC Graph of 2'-O-TBDMS Adenosin (*N-Bz*) CEP

UV Characterization

- Used to characterize the purine or pyrimidine structure and substituent

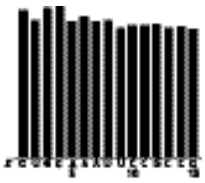




UV Spectrum of 2'-O-TBDMS-ribo Cytidine (*N-Bz*)-OP

Coupling Test

- Greater than 98-98.5% under set conditions specified in the data sheet supplied with compound



An example of a coupling efficiency profile for a RNA Phosphoramidite

Thin Layer Chromatography

- Sharp doublet in most cases, or a single spot
- Detection Limit 0.5%
- No visible impurity observed

Solubility Test

- 200 mg of pure dry product in 1.0 ml of dry acetonitrile (H_2O Content < 0.004-0.005 gm / 100 ml)

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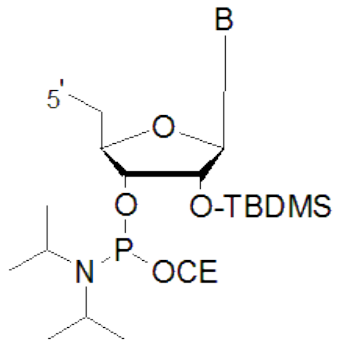
Oligo Synthesis Products

Phosphoramidites and Supports for Natural RNA Synthesis



Amidites for Natural RNA Synthesis with Standard Base Protection

5'	B	Protection	Catalog#
O-DMT	A	*N*-Bz	ANP-5671
O-DMT	C	*N*-Bz	ANP-5672
O-DMT	G	*N*-iBu	ANP-5673
O-DMT	U	n/a	ANP-5674
O-DMT	A	*N*-Ac	ANP-4546
O-DMT	C	*N*-Ac	ANP-6676
O-DMT	G	*N*-Ac	ANP-4547
O-MMT	A	*N*-Bz	ANP-5676
O-MMT	G	*N*-iBu	ANP-5677

Catalog#	Product name	250mg	500mg	1gm	2gm
ANP-5671	2'-*O*-TBDMS Adenosine (*N*-Bz) 3'-CEP, *M.W. 988.19*	$32	$58	$96	$152
ANP-5672	2'-*O*-TBDMS Cytidine (*N*-Bz) 3'-CEP, *M.W. 964.17*	$32	$58	$96	$152
ANP-5673	2'-*O*-TBDMS Guanosine (*N*-iBu) 3'-CEP, *M.W. 970.18*	$32	$58	$96	$152
ANP-5674	2'-*O*-TBDMS Uridine 3'-CEP, *M.W. 861.05*	$32	$58	$96	$152
ANP-4546	2'-*O*-TBDMS Adenosine (*N*-Ac) 3'-CEP, *M.W. 926.12*	$32	$58	$96	$152
ANP-6676	2'-*O*-TBDMS Cytidine (*N*-Ac) 3'-CEP, *M.W. 902.10*	$32	$58	$96	$152
ANP-4547	2'-*O*-TBDMS Guanosine (*N*-Ac) 3'-CEP, *M.W. 942.12*	$32	$58	$96	$152
ANP-5676	MMT-2'-*O*-TBDMS Adenosine (*N*-Bz) 3'-CEP, *M.W. 958.17*	$32	$58	$96	$152
ANP-5677	MMT-2'-*O*-TBDMS Guanosine (*N*-iBu) 3'-CEP, *M.W. 940.15*	$32	$58	$96	$152

Bulk quantities available : 10 gm, 100 gm, 500 gm - Please enquire prices

Advantages and Applications of 5'-MMT in Purine Bases for Oligo Synthesis

Due to the use of 5-ethylthiotetrazole (in most DNA/RNA Synthesis protocols), which is more acidic in nature compared to 1-H Tetrazole, the DMT group from purine bases is removed to a certain extent in the coupling step during oligo synthesis, thereby causing undersired M+1 oligo growth.
Since purine bases, A & G, cleave at the 5'-DMT at a much higher rate than 5'-MMT, the 5'-MMT protected nucleoside phosphoramidites is preferred; thus, offering a minimal level of M+1 impurities.

Please Indicate Synthesizer when Ordering

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

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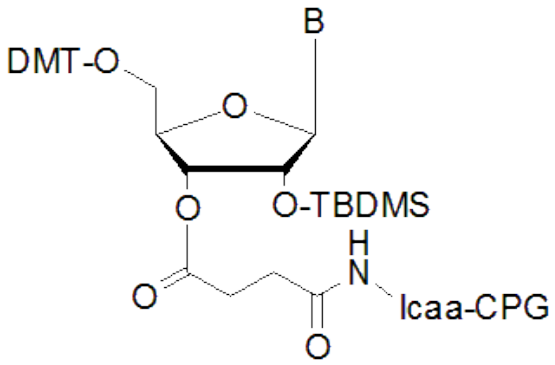
Phosphoramidites and Supports for Natural RNA Synthesis



Standard RNA Supports with Standard Base Protection

5'	B	Protection	Catalog #
O-DMT	A	*N*-Bz	N-6101
O-DMT	C	*N*-Bz	N-6102
O-DMT	G	*N*-iBu	N-6103
O-DMT	U	n/a	N-6104
O-DMT	C	*N*-Ac	N-6106

			Bulk CPG		pack of 4 cols.			each		pack of 10 cols.		
Catalog #	Product Name	Pore Size	100 mg	1 gm	40 nmole	0.2 µmole	1.0 µmole	10 µmole	15 µmole	40 nmole	0.2 µmole	1.0 µmole
N-6101-05	Adenosine (*N*-Bz)	500Å										
N-6101-10	2'-*O*-TBDMS	1000Å	$25	$240	$50	$60	$85	$240	$355	$100	$120	$170
N-6101-20	3'-Icaa CPG	2000Å										
N-6102-05	Cytidine (*N*-Bz)	500Å										
N-6102-10	2'-*O*-TBDMS	1000Å	$25	$240	$50	$60	$85	$240	$355	$100	$120	$170
N-6102-20	3'-Icaa CPG	2000Å										
N-6103-05	Guanosine (*N*-iBu)	500Å										
N-6103-10	2'-*O*-TBDMS	1000Å	$25	$240	$50	$60	$85	$240	$355	$100	$120	$170
N-6103-20	3'-Icaa CPG	2000Å										
N-6104-05	Uridine 2'-O-TBDMS	500Å										
N-6104-10	3'-Icaa CPG	1000Å	$25	$240	$50	$60	$85	$240	$355	$100	$120	$170
N-6104-20		2000Å										
N-6106-05	Cytidine (*N*-Ac)	500Å										
N-6106-10	2'-*O*-TBDMS	1000Å	$25	$240	$50	$60	$85	$240	$355	$100	$120	$170
N-6106-20	3'-Icaa CPG	2000Å										

* Currently we are offering 2'-O-TBDMS-3'-Icaa CPG Products instead of 3'-O-TBDMS-2'-Icaa CPG

Please Indicate Synthesizer when Ordering

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

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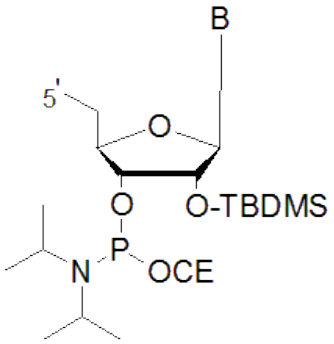
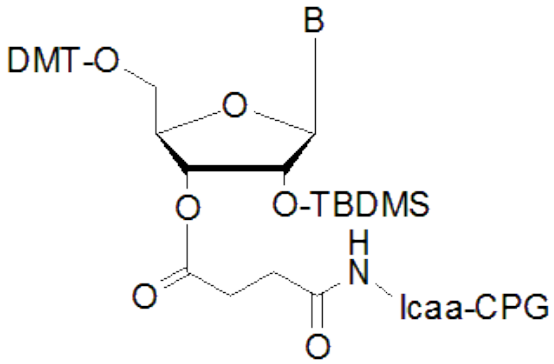


Amidites for Natural RNA Synthesis with N-PAC Base Protection

5'	B	Protection	Catalog#
O-DMT	A	*N*-PAC	ANP-6671
O-DMT	C	*N*-PAC	ANP-6672
O-DMT	G	*N*-PAC	ANP-6673
O-MMT	A	*N*-PAC	ANP-6678
O-MMT	G	*N*-PAC	ANP-6677

Catalog #	Product Name	250mg	500mg	1gm	2gm	5gm
ANP-6671	2'-*O*-TBDMS Adenosine (*N*-PAC) CEP, *M.W. 1018.22*	$70	$130	$250	$480	$1,150
ANP-6672	2'-*O*-TBDMS Cytidine (*N*-PAC) CEP, *M.W. 994.19*	$70	$130	$250	$480	$1,150
ANP-6673	2'-*O*-TBDMS Guanosine (*N*-PAC) CEP, *M.W. 1034.22*	$70	$130	$250	$480	$1,150
ANP-6678	MMT-2'-*O*-TBDMS Adenosine (*N*-PAC) CEP, *M.W. 988.19*	$72	$142	$275	$540	$1,320
ANP-6677	MMT-2'-*O*-TBDMS Guanosine (*N*-PAC) CEP, *M.W. 1004.19*	$72	$142	$275	$540	$1,320

The capping reagent phenoxy acetic anhydride is available for capping during oligonucleotide synthesis, please see pages 17-24.
For a description of the advantages of using 5'-MMT nucleoside phosphoramidites, please see page #49.



Natural RNA Supports with Labile Base Protection

B	Protection	Catalog #
A	*N*-PAC	N-P6101 NEW!
C	*N*-PAC	N-P6102 NEW!
G	*N*-PAC	N-P6103 NEW!
U	n/a	N-6104 NEW!

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	pack of 4 cols. 40 nmole	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 40 nmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-P6101-05 N-P6101-10	Adenosine (*N*-PAC) 2'-*O*-TBDMS-3'-Icaa CPG	500Å 1000Å	$35	$245	$50	$65	$80	$100	$130	$160
N-P6102-05 N-P6102-10	Cytidine (*N*-PAC) 2'-*O*-TBDMS-3'-Icaa CPG	500Å 1000Å	$35	$245	$50	$65	$80	$100	$130	$160
N-P6103-05 N-P6103-10	Guanosine (*N*-PAC) 2'-*O*-TBDMS-3'-Icaa CPG	500Å 1000Å	$35	$245	$50	$65	$80	$100	$130	$160
N-6104-05 N-6104-10	Uridine-2'-O-TBDMS-3'-Icaa CPG	500Å 1000Å	$25	$240	$50	$60	$85	$100	$120	$170

* Currently we are offering 2'-O-TBDMS-3'-Icaa CPG Products instead of 3'-O-TBDMS-3'-Icaa CPG

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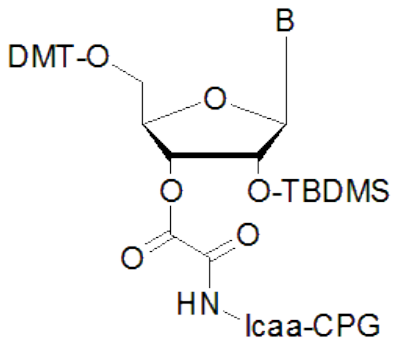

Oxalyl RNA Supports with Labile Base Protection for RNA Synthesis

B	Protection	Catalog #
A	*N*-PAC	N-5141 NEW!
C	*N*-PAC	N-5142 NEW!
G	*N*-PAC	N-5143 NEW!
U	n/a	N-5144 NEW!

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	pack of 4 cols. 40 nmole	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 40 nmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-5141-05	Adenosine (*N*-PAC)-2'-*O*-TBDMS-3'-oxalyl lcaa CPG	500Å	$42	$294	$60	$78	$96	$120	$156	$192
N-5142-05	Cytidine (*N*-PAC)-2'-*O*-TBDMS -3'-oxalyl lcaa CPG	500Å	$42	$294	$60	$78	$96	$120	$156	$192
N-5143-05	Guanosine (*N*-PAC)-2'-*O*-TBDMS -3'-oxalyl lcaa CPG	500Å	$42	$294	$60	$78	$96	$120	$156	$192
N-5144-05	Uridine-2'-*O*-TBDMS-3'-oxalyl lcaa CPG	500Å	$42	$294	$60	$78	$96	$120	$156	$192

* Currently we are offering 2'-O-TBDMS-3'-oxalyl lcaa CPG Products instead of 3'-O-TBDMS-2'-oxalyl lcaa CPG

Ammonia Free Oligo Deprotection Solution should be used under the following Conditions:

1. PAC-Protected nucleoside phosphoramidites must be used for efficient base deprotection using ammonia free oligo deprotec tion solution.

2. Oxalyl CPGs must be used for ammonia free oligo deprotection solution to cleave the oligo from the support. The standard succinyl CPGs will not adequately deprotect when using ammonia free oligo deprotection solution. The oligonucleotide bound to solid support CPG (1 µmole scale synthesis) after oligonucleotide synthesis is ether washed, air dryied, and is placed in a vial with a septum cap. 1ml of the ammonia free oligo deprotection solution is added using a syringe. This reaction is typically done at 37°C for 24 hours.

Ammonia Free Oligo Deprotection Solution

Catalog#	Pricing
RN-1435	$35.00 / 25 ml

Please Indicate Synthesizer when Ordering

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

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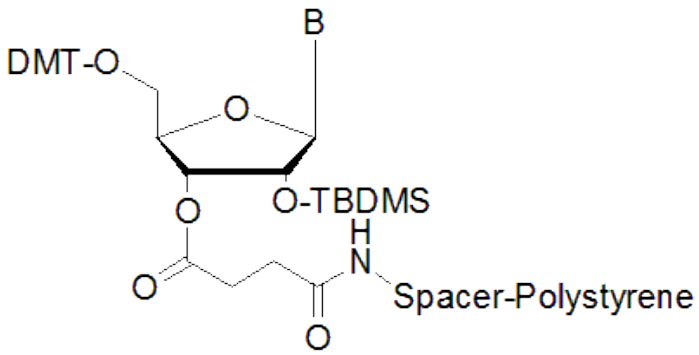
Oligo Synthesis Products

Phosphoramidites and Supports for Natural RNA Synthesis



Natural RNA with Succinyl Polystyrene

B	Protection	Catalog #
A	*N*-Bz	N-6111 NEW!
C	*N*-Bz	N-6112 NEW!
G	*N*-iBu	N-6113 NEW!
U	n/a	N-6114 NEW!
C	*N*-Ac	N-6116 NEW!

Catalog #	Product Name	Pore Size	Particle Size	Bulk Polystyrene Loading 30-40 µm/gm 100 mg	1 gm	5 gm	pack of 4 cols. 40 nmole	.02 µmole	1.0 µmole	pack of 10 cols. 40 nmole	0.2 µmole	1.0 µmole
N-6111-03	Adenosine (*N*-Bz) 2'-*O*-TBDMS 3'-Diamido Polystyrene	300Å	60-70 microns	$40	$150	$465	$55	$65	$90	$110	$130	$180
N-6112-03	Cytidine (*N*-Bz) 2'-*O*-TBDMS 3'-Diamido Polystyrene	300Å	60-70 microns	$40	$150	$465	$55	$65	$90	$110	$130	$180
N-6113-03	Guanosine (*N*-iBu) 2'-*O*-TBDMS 3'-Diamido Polystyrene	300Å	60-70 microns	$45	$165	$490	$60	$70	$100	$120	$140	$200
N-6114-03	Uridine 2'-*O*-TBDMS 3'-Diamido Polystyrene	300Å	60-70 microns	$35	$140	$455	$50	$60	$85	$100	$120	$170
N-6116-03	Cytidine (*N*-Ac) 2'-*O*-TBDMS 3'-Diamido Polystyrene	300Å	60-70 microns	$40	$150	$465	$55	$65	$90	$110	$130	$180

*** Currently we are offering 2'-O-TBDMS-Diamido Polystyrene Icaa CPG Products instead of 3'-O-TBDMS-2'-Diamido Polystyrene Icaa CPG**

ChemGenes has developed unique polystyrene supports and columns that have special appeal due to rigidity, swelling, and inertness towards moisture and water. Our polystyrenes have a special linker and pore size (500Å). This unusual cross-linking nature matches very closely with CPG (500Å).

Our supports have been checked for the synthesis of medium length oligos of varying sizes up to 40-mer.

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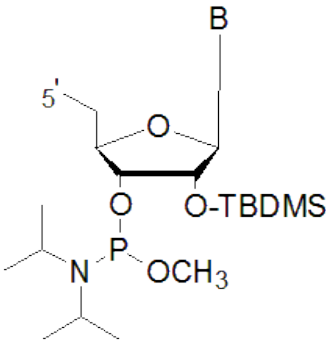
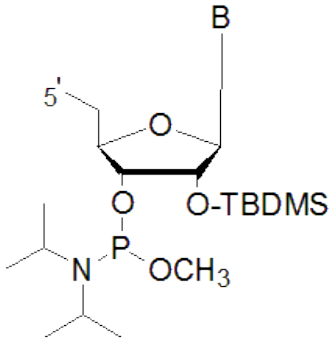


Natural RNA Amidites, *P*-Methoxy and Standard Base Protection

5'	B	Protection	Catalog#
O-DMT	A	*N*-Bz	ANP-5691
O-DMT	C	*N*-Bz	ANP-5692
O-DMT	G	*N-iBu*	ANP-5693
O-DMT	U	n/a	ANP-5694
O-MMT	A	*N*-Bz	ANP-5696
O-MMT	G	*N*-iBu	ANP-5697

Catalog#	Product name	1gm	10gm	100gm
ANP-5691	2'-*O*-TBDMS Adenosine (*N*-Bz) 3'-*P*-methoxy phosphoramidite, *M.W. 949.16*	$96	$650	$5800
ANP-5692	2'-*O*-TBDMS Cytidine (*N*-Bz) 3'-*P*-methoxy phosphoramidite, *M.W. 925.13*	$96	$650	$5800
ANP-5693	2'-*O*-TBDMS Guanosine (*N*-iBu) 3'-*P*-methoxy phosphoramidite, *M.W. 901.11*	$96	$650	$5800
ANP-5694	2'-*O*-TBDMS Uridine 3'-*P*-methoxy phosphoramidite, *M.W. 822.01*	$96	$650	$5800
ANP-5696	MMT-2'-*O*-TBDMS Adenosine (*N*-Bz) 3'-*P*-methoxy phosphoramidite, *M.W. 919.13*	$96	$650	$5800
ANP-5697	MMT-2'-*O*-TBDMS Guanosine (*N*-iBu) 3'-*P*-methoxy phosphoramidite, *M.W. 965.16*	$96	$650	$5800



Natural RNA Amidites, *P*-Methoxy and Labile Base Protection

5'	B	Protection	Catalog#
O-DMT	A	*N*-PAC	ANP-3861
O-DMT	C	*N*-PAC	ANP-3862
O-DMT	G	*N*-PAC	ANP-3863
O-MMT	A	*N*-PAC	ANP-3866
O-MMT	G	*N*-PAC	ANP-3867

Catalog #	Product Name	250mg	500mg	1gm	2gm	5gm
ANP-3861	2'-*O*-TBDMS Adenosine (*N*-PAC) 3'-*P*-methoxy phosphoramidite, *M.W. 979.18*	$90	$175	$335	$645	$1,550
ANP-3862	2'-*O*-TBDMS Cytidine (*N*-PAC) 3'-*P*-methoxy phosphoramidite, *M.W. 955.16*	$90	$175	$335	$645	$1,550
ANP-3863	2'-*O*-TBDMS Guanosine (*N*-PAC) 3'-*P*-methoxy phosphoramidite, *M.W. 995.18*	$90	$175	$335	$645	$1,550
ANP-3866	MMT-2'-*O*-TBDMS Adenosine (*N*-PAC) 3'-*P*-methoxy phosphoramidite, *M.W. 949.16*	$100	$190	$375	$735	$1,800
ANP-3867	MMT-2'-*O*-TBDMS Guanosine (*N*-PAC) 3'-*P*-methoxy phosphoramidite, *M.W. 965.16*	$100	$190	$375	$735	$1,800

- For natural phosphodiester oligonucleotide, use thiophenol solution (catalog#: RN-1465 on pages 17-23) to thoroughly remove the *P*-methoxy group prior to ethanolic ammonia deprotection.
- To make *P*-methoxy phosphotriester oligonucleotides, use our ammonia free deprotection solution listed on page 110.

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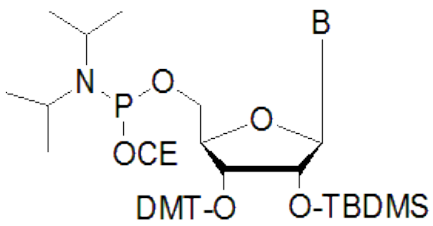
Oligo Synthesis Products

Phosphoramidites and Supports for Modified RNA Synthesis

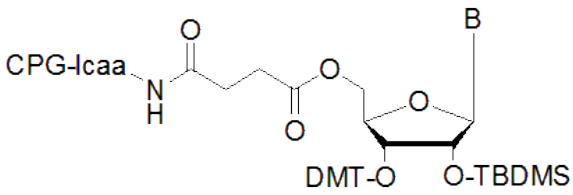


Amidites for Reverse RNA Synthesis with Standard Base Protection

3'	B	Protection	Catalog#	
O-DMT	A	*N*-Bz	ANP-3401	NEW!
O-DMT	C	*N*-Bz	ANP-3402	NEW!
O-DMT	C	*N*-Ac	ANP-3405	NEW!
O-DMT	G	*N*-iBu	ANP-3403	NEW!
O-DMT	U	n/a	ANP-3404	NEW!

Catalog #	Product Name	250mg	500mg	1gm	2gm	5gm
ANP-3401	3'-DMT-2'-*O*-TBDMS Adenosine (*N*-Bz) 5'-CEP, *M.W. 988.19*	$70	$130	$250	$480	$855
ANP-3402	3'-DMT-2'-*O*-TBDMS Cytidine (*N*-Bz) 5'-CEP, *M.W. 964.17*	$70	$130	$250	$480	$855
ANP-3405	3'-DMT-2'-*O*-TBDMS Cytidine (*N*-Ac) 5'-CEP, *M.W. 902.10*	$70	$130	$250	$480	$855
ANP-3403	3'-DMT-2'-*O*-TBDMS Guanosine (*N*-iBu) 5'-CEP, *M.W. 970.18*	$72	$142	$275	$540	$855
ANP-3404	3'-DMT-2'-*O*-TBDMS Uridine 5'-CEP, *M.W. 861.05*	$72	$142	$275	$540	$855

Bulk quantities available : 10 gm, 100 gm, 500 gm - Please enquire prices



Reverse RNA Supports with Standard Base Protection5

3'	B	Protection	Catalog #	
O-DMT	A	*N*-Bz	N-6201	NEW!
O-DMT	C	*N*-Bz	N-6202	NEW!
O-DMT	C	*N*-Ac	N-6205	NEW!
O-DMT	G	*N*-iBu	N-6203	NEW!
O-DMT	U	n/a	N-6204	NEW!

			Bulk CPG		pack of 4 cols.			pack of 10 cols.		
Catalog #	Product Name	Pore Size	100 mg	1 gm	40 nmole	0.2 µmole	1.0 µmole	40 nmole	0.2 µmole	1.0 µmole
N-6201-05 N-6201-10	Adenosine (*N*-Bz) 2'-*O*-TBDMS-5'-lcaa CPG	500Å 1000Å	$35	$245	$50	$65	$80	$100	$130	$160
N-6202-05 N-6202-10	Cytidine (*N*-Bz) 2'-*O*-TBDMS-5'-lcaa CPG	500Å 1000Å	$35	$245	$50	$65	$80	$100	$130	$160
N-6205-05 N-6205-10	Cytidine (*N*-Ac) 2'-*O*-TBDMS-5'-lcaa CPG	500Å 1000Å	$25	$240	$50	$60	$85	$100	$120	$170
N-6203-05 N-6203-10	Guanosine (*N*-iBu) 2'-*O*-TBDMS-5'-lcaa CPG	500Å 1000Å	$35	$245	$50	$65	$80	$100	$130	$160
N-6204-05 N-6204-10	Uridine 2'-*O*-TBDMS-5'-lcaa CPG	500Å 1000Å	$25	$240	$50	$60	$85	$100	$120	$170

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Highlights of Reverse RNA Synthesis : High Purity Synthetic RNA
RNA Synthesis in Reverse Direction (5'->3')
Leads to Smooth 3'-conjugation of macromolecules to Synthetic RNA. Reverse RNA Synthesis Results in Complete Absence of M+1 Species.

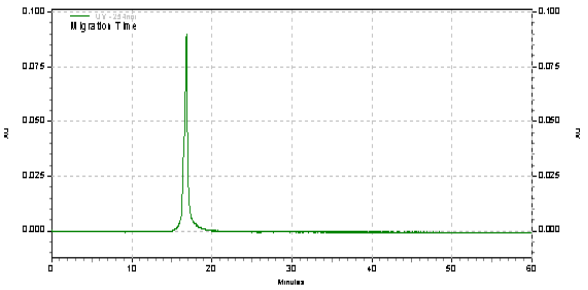

Figure 1. Capillary Gel Electrophoresis (CE) of 21- Mer RNA with 3'-Cholesterol-TEG linker. Reverse direction (5'->3') synthesis and HPLC purification. 1 umole scale. Purity; 99.9%.

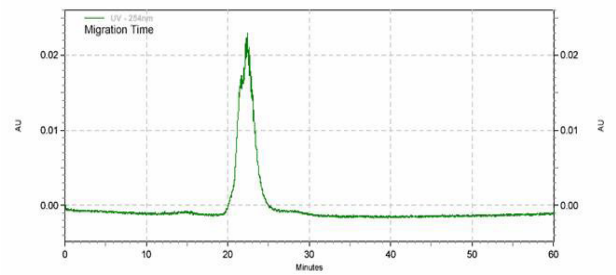

Figure 2a. Capillary Gel Electrophoresis (CE) of the HPLC purified 21- mer RNA with 3'- PEG(Poly ethyleneglycol; MW; 2000). Made by Reverse RNA synthesis method (5'->3'-direction). Expedite model 8909- 1 umole scale. Purity; 100%

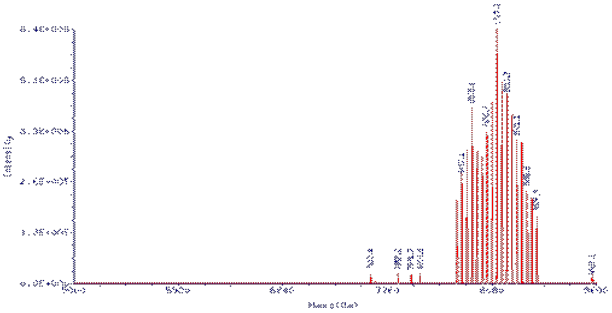

Figure. 2b. ESI Mass Spectral analysis of 21-mer RNA with 3'- PEG -2000 attachment, purified RNA as shown in Fig. 2a. The synthesis was carried out in reverse direction (5' --> 3' direction). The PEG-2000 amidite (ChemGenes catalog ;CLP-3119) was attached as last step.
Mass Spectral analysis of the purified RNA:
Calculated Molecular Weight: 8684.1
Observed Molecular Weight: 8681.1
Note: There is a distribution of at least 14 PEG species of the RNA on both sides of the Calculated molecular weight with PEG-2000. Thus species from 8417.1 to 8945.3 are present with a molecular weight difference of a glycol unit (+/- 44).

Salient Features:

1. The crude RNA's have significantly more closer impurities (M-1) in the conventional method (3'-5'-direction), as compared to reverse RNA synthesis (5'-3' direction). Therefore after purification RNA synthesized by reverse RNA synthesis are purer.
2. The feature mentioned above is much more visible in the synthesis of cholesterol attached to 3'- end of RNA. Therefore it is easier to purify RNA with cholesterol at 3'-end synthesized by reverse RNA synthesis.
3. M+1 impurities are essentially absent in the RNAs synthesized by reverse RNA synthesis method.
   It is postulated that in the molecule, ribonucleoside- 3'-DMT-2'-O-TBDMS-5'- phosphoramidites, the 3'-DMT is not cleaved by 5-ethylthiotetrazole during the coupling time of oligonucleotide chain extension.
4. RNA containing macromolecules at the 3'-end which are generally inaccessible by conventional methods (3'-->5') are easily synthesized by reverse RNA synthesis (5'->3' direction). These RNAs can be produced in high purity.
5. 3'-PEG RNA (21- mer) was synthesized; after purification the oligonucleotide was essentially 100% pure .

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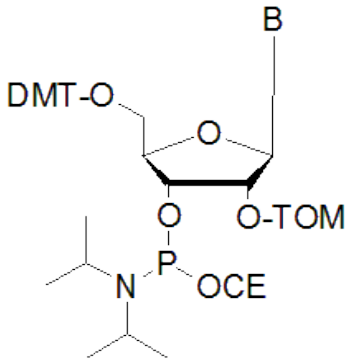
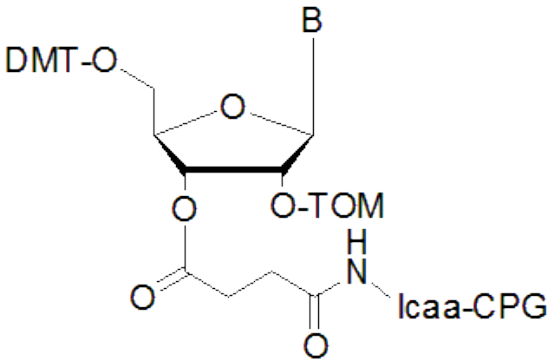


Natural TOM Amidites for RNA Synthesis, Standard Base Protection

5'	B	Protection	Catalog#	
O-DMT	A	*N-Ac*	ANP-3201	NEW!
O-DMT	C	*N-Ac*	ANP-3202	NEW!
O-DMT	G	*N-Ac*	ANP-3203	NEW!
O-DMT	U	n/a	ANP-3205	NEW!

Catalog #	Product Name	1gm	5gm	10gm	100gm
ANP-3201	2'-TOM ribo Adenosine (*N-Ac*) 3'-CEP, *M.W. 998.23*	$90	$350	$600	$5000
ANP-3202	2'-TOM ribo Cytidine (*N-Ac*) 3'-CEP, *M.W. 974.18*	$90	$350	$600	$5000
ANP-3203	2'-TOM ribo Guanosine (*N-Ac*) 3'-CEP, *M.W. 1014.15*	$90	$350	$600	$5000
ANP-3205	2'-TOM ribo Uridine 3'-CEP, *M.W. 932.75*	$90	$350	$600	$5000



TOM RNA Supports with Standard Base Protection

5'	B	Protection	Catalog #	
O-DMT	A	*N-Ac*	N-32001	NEW!
O-DMT	C	*N-Ac*	N-32002	NEW!
O-DMT	G	*N-Ac*	N-32003	NEW!
O-DMT	U	n/a	N-32005	NEW!

			Bulk CPG		pack of 4 cols.		pack of 10 cols.			
Catalog #	Product Name	Pore Size	100 mg	1 gm	40 nmole	0.2 µmole	1.0 µmole	40 nmole	0.2 µmole	1.0 µmole
N-32001-05	Adenosine (*N-Ac*)	500Å	$35	$245	$50	$65	$80	$100	$130	$160
N-32001-10	2'-TOM-3'-Icaa-CPG	1000Å								
N-32002-05	Cytidine (*N-Ac*)	500Å	$35	$245	$50	$65	$80	$100	$130	$160
N-32002-10	2'-TOM-3'-Icaa-CPG	1000Å								
N-32003-05	Guanosine (*N-Ac*)	500Å	$35	$245	$50	$65	$80	$100	$130	$160
N-32003-10	2'-TOM-3'-Icaa-CPG	1000Å								
N-32005-05	Uridine	500Å	$25	$240	$50	$60	$85	$100	$120	$170
N-32005-10	2'-TOM-3'-Icaa CPG	1000Å								

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Highlight of TOM-Amidites RNA Synthesis

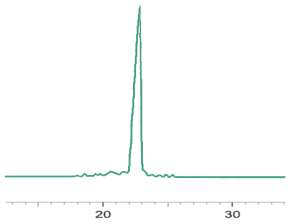
2'-Triisopropylsilyl-oxy methyl amidites **Highly suitable for Large Scale Therapeutic Grade RNA Synthesis & Long RNA sequences, Aptamers Etc.**

Perfected Technology at ChemGenes makes Available Bulk quantities (100g to kilogram scale batches) & Affordable Prices

Produced Under GMP Guidelines.

The Following superior qualities makes TOM amidites most desirable for Therapeutic oligonucleotide production.

- Highest coupling efficiency per step, due to lower steric hindrance comparable to DNA synthesis. Fast coupling time (2-4 minutes for differnt scale of synthesis), and complete absence of 3' impurities, either manufactured TOM amidites, 2' to 3'- migration during oligo synthesis or during work up, results in highest purity Oligonucleotiodes.
- The synthesis resembles DNA Synthesis like behaviour
- Coupling Efficiency consistently greater than 98% per step.
- Short deprotection time for n- protecting group with a time of 4-6 hours depending on chain length, and with liberal amount of water. Labile Base Protecting groups used are (*N-Ac*-A ; *N-Ac*-C and *N-Ac* –G). Easy removal of TOM protecting group is achieved under mild condtions and in significantly excess amount of water without side effects.
- No Formadehyde adduct formation occurs in the oligos made by using TOM amidite chemistry and after single Ion-Exchange purification, analyzed by ESI mass spectral data. None of the Mass spectral data showed any peak corresponding to hydroxymethyl group (CH_2 –OH) either as single unit or multiple units, with mass corresponding to 30 or its multiples.
- A comparative study of the quality of oligonucleotides synthesized using TOM amidites and O-TBDMS amidites showed that the RNA oligos synthesized using TOM amidites were found to result in far superior quality after single Ion-Exchange purification and analyzed by CE(capillary Gel) and ESI MS.
- There is an overall time reduction using TOM amidite chemistry. All the steps, viz., base deprotection, TOM deprotection and ease of purification. Besides high yield the processes lead to high purity as well.



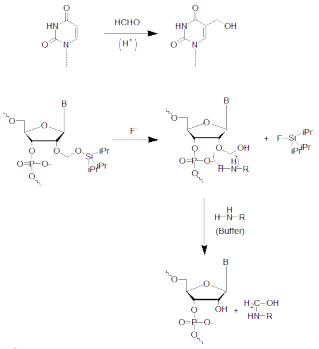
12 Mer RNA @ 15 Micromole Using TOM Amidites CE Analysis:

Studies to Confirm Absence of Formaldehyde Adduct formation:

During the loss of silyl and generation of formaldehyde and C-5 formylation or n-formylation of nucleoside bases does not occur due to presence of aq TRIS buffer,Ph 7.4, which captures all the formaldehyde formed and prevents any base modification as analyzed by ESI mass spectral data. None of the Mass spectral data showed any peak corresponding to hydroxymethyl group (CH_2–OH) either as single unit or multiple units, with mass corresponding to 30 or its multiples (fig. 1a and fig. 1b).
adduct is seen (see the ESI MS data)

ESI/MS data is presented here to substantiate clean RNA synthesis. No peak corresponding to the formaldehyde adduct (molecular ion + 30) has been detected.

It is likely that formaldehyde formed after the cleavage is captured by buffer, which is mildly basic, pH 7.4. Beacuse of nature of formaldehyde addition to pyrimidines (see Scheme below), pH 7.4 is recommended during desilylation step.



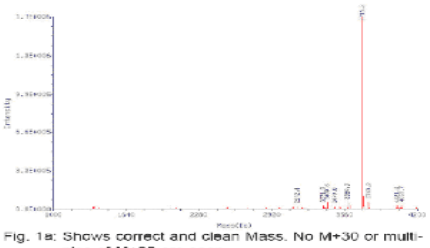


Fig. 1a: Shows correct and clean Mass. No M+30 or multiples of M+30 are seen.

Observed: MW: 3715.3
Target: MW: 3715.3

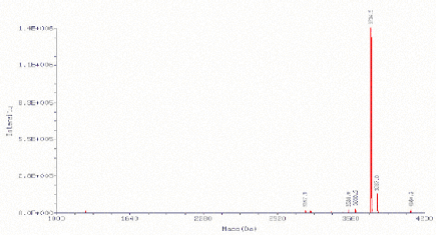


Fig. 1b: Shows correct and clean Mass. No M+30 or multiples of M+30 are seen.

Observed: MW: 3734.5
Target: MW: 3734.5

References :

1.TOM Amidites are intellectual property of Qiagen Inc., Germantown, MD and licensed to ChemGenes Corp. for sales in Therapeutics RNA market.
2.Stefan Pitsch, Patrick A. Weiss, Luzi Jenny, Alfred Stutz, and Xiaolin Wu, Helv. Chem.Acta- 3773-95, Vol. 84 (2001).
3.TOM Protecting group chemistry is covered by US Patent No. 5,986,084. ChemGenes Corp. holds license agreement with Qiagen Inc. for worldwide supply for Therapeutics market.

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Email: info@chemgenes.com

Summary of Modified Ribo Phosphoramidites & Supports

ChemGenes produces a wide range of modified RNA phosphoramidites and supports.

The following summarizes our key modifications:

Unnatural 2'-5'- Linkage amidites

N^3 Methyl & Thiobenzylethyl amidites
Includes N3- Methyl Uridine, N3-Methyl ribo Thymidine, & N3-Thiobenzoylethyl Uridine Amidites & Supports.

Inosine, ribo Thymidine, 5-Methyl Cytidine, and 2,2'-Anhydro Uridine Amidites & Supports

N^6 Substituted Purine Amitides & Supports
Includes N^6- Benzyl Adenosine and N^6-isopentenyl Adenosine Amidites & Supports.

Puromycin CPG

N^4-Ethyl Cytidine, 4 Thio -U , and Pyridine-2-One Products

2'-Fluoro and 2'-Amino Amidites & Supports
Includes 2' Fluoro C, 2'-Fluoro U, 2'-Amino C, 2'-Amino U

2'-Amino Adenosine , Purine riboside, & 2-Amino purine riboside

Halogenated amidites & Supports
Includes 5-Bromo Cytidine, 5-Bromo Uridine, 5-Iodo Cytidine, 5-Iodo Uridine , 5-Fluoro Uridine, and 8-Bromo Adenosine

7-Deaza Amidites & Supports
7-Deaza-7-Modified Amidites & Supports

isoC and isoG Amidites & Supports

2',3'- Diacetyl Guanosine & Uridine

L -RNA Amidites & Supports

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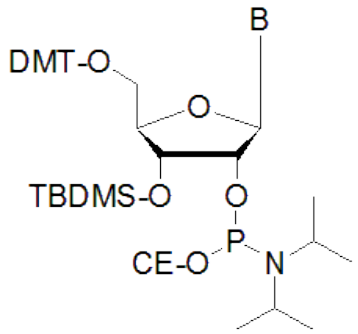


Unnatural 2'-5' Linkage RNA Amidites with Standard Base Protection

5'	B	Protection	Catalog#
O-DMT	A	*N*-Bz	ANP-5681
O-DMT	C	*N*-Bz	ANP-5682
O-DMT	G	*N*-iBu	ANP-5683
O-DMT	U	n/a	ANP-5684

Catalog#	Product name	250mg	500mg	1gm
ANP-5681	Adenosine (*N*-Bz) 3'-*O*-TBDMS 2'-CEP, *M.W. 988.19*	$85	$160	$280
ANP-5682	Cytidine (*N*-Bz) 3'-*O*-TBDMS 2'-CEP, *M.W. 964.17*	$85	$160	$280
ANP-5683	Guanosine (*N*-iBu) 3'-*O*-TBDMS 2'-CEP, *M.W. 970.18*	$85	$160	$280
ANP-5684	Uridine 3'-*O*-TBDMS 2'-CEP, *M.W. 861.05*	$85	$160	$280

Synthesis of Unnatural RNA (2'-5'- LINKAGE), 2'-5'-linked Oligos

ChemGenes offers a wide variety of 3'-O-TBDMS protected ribonucleoside phosphoramidites that allow the synthesis of 5'-2'-linked oligos. The low molecular weight oligomer 5'-O-triphosphoryl adenylyl-(2'-5')-adenylyl-(2'-5')-adenosine (pppA2'p5'A2'p5'A) activates the latent endo-ribonuclease RNase L, which subsequently cleaves the messenger and ribosomal RNAs *(R. Charubala, E. Uhlmann, F. Himmelsbach, W. Pfleiderer, Helv. Chem. Acta, 70, 2028, 1987)*.

Thus such oligonucleotides are very useful to determine their exact biological role, to extend their biological half life, or to alter the biological activity of the core structure (A2'p5'A2'p5'A) *(J. C. Jamoulle, J. Imai, K. Lesiak, P. F. Torrence, Biochemistry, 23, 3063, 1984)*.

2',5'-linked synthetic RNA sequences consisting of mixed bases were synthesized. RNA 2',5' duplexes are not substrates of the enzyme RNAse H (Escherichia coli or HIV-1 reverse transcriptase). However, they can inhibit the RNaseH mediated cleavage of a natural DNA:RNA substrate *(Marita Wasner, Dominique Arion, Gadi Borkow, Anne Noronha, Andre H. Uddin, Michael A. Parniak and Masad J. Damha, Biochemistry. 37, 7478-7486, 1998)*.

Please Indicate Synthesizer when Ordering

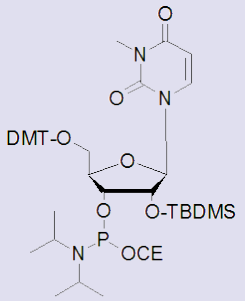
ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

Oligo Synthesis Products

Phosphoramidites and Supports for Modified RNA Synthesis

N^3-Methyl Uridine CEP

(N^3-Methyl-2'-O-TBDMS Uridine CEP)



$C_{46}H_{63}N_4O_9PSi$
Mol. Wt.: 875.07

Catalog#

ANP-7451

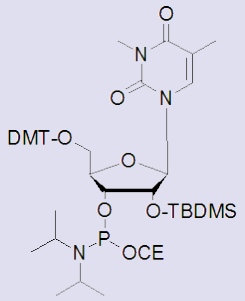
Pricing

$145.00 / 100 µmole
$380.00 / 250 mg

Purity: 98% +

N^3-Methyl ribo Thymidine CEP

(N^3-Methyl-2'-O-TBDMS ribo Thymidine CEP)



$C_{47}H_{65}N_4O_9PSi$
Mol. Wt.: 889.10

Catalog#

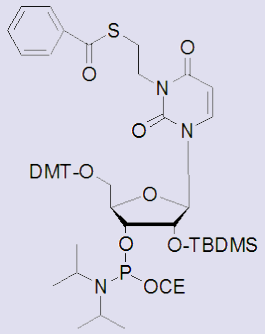
ANP-7461

Pricing

$180.00 / 100 µmole
$450.00 / 250 mg

Purity: 98% +

N^3-Thiobenzoylethyl Uridine CEP



$C_{54}H_{69}N_4O_{10}PSSi$
Mol. Wt.: 1025.27

Catalog#

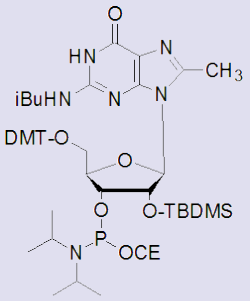
ANP-7441

Pricing

$280.00 / 100 µmole
$615.00 / 250 mg

Purity: 98% +

8-Methyl ribo Guanosine CEP



$C_{51}H_{70}N_7O_9PSi$
Mol. Wt.: 984.20

Catalog#

ANP-6274

Pricing

$305.00 / 100 µmole
$685.00 / 250 mg

Purity: 99% +

N^3 Substituted Pyrimidine Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-9814-05	N^3-Methyl Uridine	500Å	$75	$475	$90	$120	$180	$240
N-9814-10	2'-O-TBDMS 3'-Icaa CPG	1000Å						
N-9816-05	N^3-Methyl ribo Thymidine	500Å	$75	$475	$90	$120	$180	$240
N-9816-10	2'-O-TBDMS 3'-Icaa CPG	1000Å						
N-9828-05	N^3-Thiobenzoylethyl Uridine	500Å	$110	$475	$115	$155	$230	$310
N-9828-10	2'-O-TBDMS 3'-Icaa CPG	1000Å						
N-9909-05	8-Methyl ribo Guanosine	500Å	$75	$475	$90	$120	$180	$240
N-9909-10	2'-O-TBDMS 3'-Icaa CPG	1000Å						

N^3-methyl Uridine and N^3-methyl Thymidine are the results of chemical carcinogens on DNA/RNA. In general, alkylation products are formed at the ring-nitrogen atoms and the exocyclic oxygen atoms of all four bases as well as at the oxygen atoms of the internucleotide phosphate bonds. Such adducts can initiate neoplastic transformations *(B. Singer, J. T. Kusmierek, Ann. Rev. Biochem., 52, 522, 1982; R. Saffhill, G. P. Margison, P. J. O'Connor, Biochim. Biophys. Acta, 823, 111, 1985)*.

The individual alkylation products are thought to possess different mutagenic and carcinogenic properties *(Nucl. Acids Res., 20, 6471, 1992)*.

N^3-methyl Uridine phosphoramidite and N^3-methyl Thymidine phosphoramidite are currently available from ChemGenes for incorporation into RNA/DNA to further study the biochemical nature of these oligonucleotides. It is important to gain an understanding of these ring-nitrogen modified bases for eventual damage repairs.

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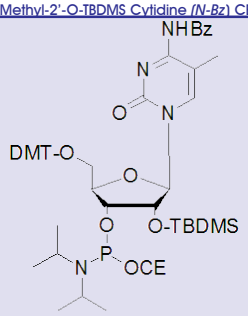
5-Methyl Cytidine CEP

(5-Methyl-2'-O-TBDMS Cytidine (*N-Bz*) CEP)



$C_{53}H_{68}N_5O_9PSi$
Mol. Wt.: 978.19

Catalog#

ANP-5675

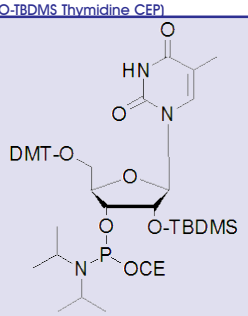
Pricing

$120.00 / 100 µmole
$320.00 / 250 mg

Purity: 98% +

Ribo Thymidine CEP

(2'-O-TBDMS Thymidine CEP)



$C_{46}H_{63}N_4O_9PSi$
Mol. Wt.: 875.07

Catalog#

ANP-7511

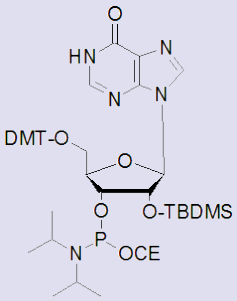
Pricing

$185.00 / 100 µmole
$480.00 / 250 mg

Purity: 98% +

Inosine CEP

(2'-O-TBDMS Inosine CEP)



$C_{46}H_{61}N_6O_8PSi$
Mol. Wt.: 885.07

Catalog#

ANP-5680

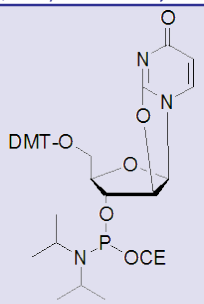
Pricing

$ 70.00 / 250 mg
$120.00 / 500 mg
$190.00 / 1 gm

Purity: 98% +

2,2'-Anhydro Uridine CEP

(DMT-2,2'-Anhydro Uridine CEP)



$C_{39}H_{45}N_4O_8P$
Mol. Wt.: 728.77

Catalog#

ANP-4876

Pricing

$165.00 / 100 µmole
$485.00 / 250 mg

Purity: 98% +

2'-Succinyl Icaa Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-9822-05 N-9822-10	5-Methyl Cytidine (*N*-Bz) 2'-*O*-TBDMS 3'-Icaa CPG	500Å 1000Å	$ 60	$475	$75	$110	$150	$210
N-8477-05 N-8477-10	Ribo Thymidine 2'-*O*-TBDMS 3'-Icaa CPG	500Å 1000Å	$110	$545	$75	$ 90	$150	$180
N-8370-05 N-8370-10	Ribo Inosine 2'-*O*-TBDMS 3'-Icaa CPG	500Å 1000Å	$ 75	$425	$50	$ 65	$100	$130
N-9810-05 N-9810-10	2,2'-Anhydro Uridine 3'-Icaa CPG	500Å 1000Å	$ 60	$ 485	$ 60	$ 75	$120	$150

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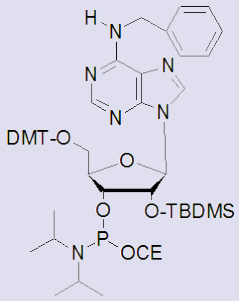
N^6-Benzyl Adenosine CEP

(N^6-Benzyl-2'-O-TBDMS Adenosine CEP)



$C_{53}H_{68}N_7O_7PSi$
Mol. Wt.: 974.21

Catalog#

ANP-8614

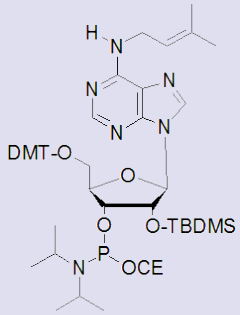
Pricing

$365.00 / 100 µmole

Purity: 98% +

N^6-isopentenyl Adenosine CEP

(N^6-isopentenyl-2'-O-TBDMS Adenosine CEP)



$C_{51}H_{70}N_7O_7PSi$
Mol. Wt.: 952.20

Catalog#

ANP-8615

Pricing

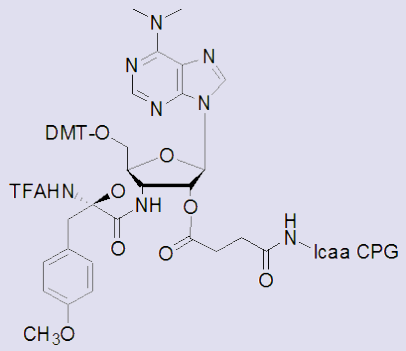
$365.00 / 100 µmole

Purity: 98% +

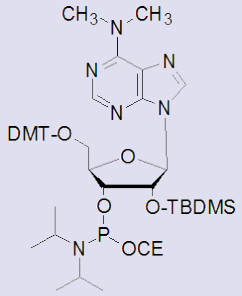
N^6-Substituted Pyrimidine Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-9050-05 N-9050-10	N^6-Benzyl Adenosine 3'-O-TBDMS 2'-Icaa CPG	500Å 1000Å	$120	$800	$105	$170	$210	$340
N-9060-05 N-9060-10	N^6-isopentyl Adenosine 3'-O-TBDMS 2'-Icaa CPG	500Å 1000Å	$125	$810	$110	$175	$220	$350

Puromycin 2'-succinyl Icaa CPG



N^6,N^6-Dimethyl-Adenosine-2'-TBDMS-3'-CEP



$C_{48}H_{66}N_7O_7PSi$
Mol. Wt.: 912.14

Catalog#

ANP-8626

Pricing

$365.00 / 100 µmole

Purity: 98% +

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	Each 10 µmole	Each 15 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-1971-05 N-1971-10	Puromycin 2'-Icaa CPG	500Å 1000Å	$108	$896	$108	$190	$324	$488	$216	$380

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ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

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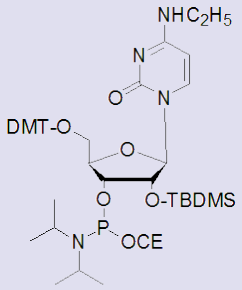
Phosphoramidites and Supports for Modified RNA Synthesis

N^4-Ethyl Cytidine CEP

(N^4-Ethyl 2'-O-TBDMS Cytidine CEP)



$C_{47}H_{66}N_5O_8PSi$
Mol. Wt.: 888.12

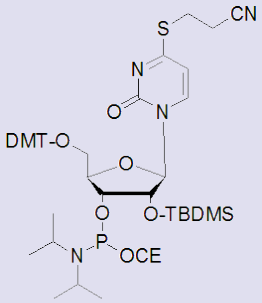
Catalog#
ANP-4165

Pricing
$265.00 / 100 µmole
$455.00 / 250 mg

Purity: 98% +

4-Thio Uridine CEP

(4-Thiocyanoethyl 2'-O-TBDMS Uridine CEP)



$C_{48}H_{64}N_5O_8PSSi$
Mol. Wt.: 930.18

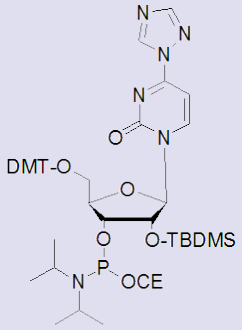
Catalog#
ANP-8101

Pricing
$350.00 / 100 µmole
$600.00 / 250 mg

Purity: 98% +

4-Triazolyl Uridine CEP

(4-Triazolyl 2'-O-TBDMS Uridine CEP)



$C_{47}H_{62}N_7O_8PSi$
Mol. Wt.: 912.10

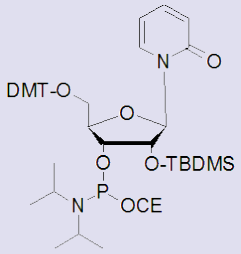
Catalog#
ANP-9167

Pricing
$255.00 / 100 µmole
$480.00 / 250 mg

Purity: 98% +

Pyridine-2-One CEP

(Pyridine-2-One 2'-O-TBDMS CEP)



$C_{46}H_{62}N_3O_8PSi$
Mol. Wt.: 844.06

Catalog#
ANP-8611

Pricing
$280.00 / 100 µmole
$665.00 / 250 mg

Purity: 98% +

3'-Succinyl Icaa Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-9020-05	Pyridine-2-One	500Å	$105	$685	$95	$145	$190	$290
N-9020-10	2'-O-TBDMS 3'-Icaa CPG	1000Å						
N-9824-05	N^4-Ethyl Cytidine	500Å	$ 60	$525	$85	$125	$170	$250
N-9824-10	2'-O-TBDMS 3'-Icaa CPG	1000Å						

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AB30	AB39	EX	MR	PX

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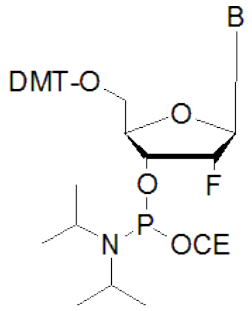
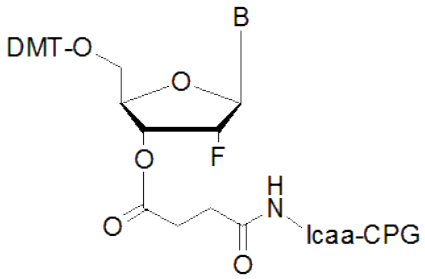


2'-Fluoro-2'- deoxy Amidites with Base Protection

5'	B	Protection	Catalog#	
O-DMT	A	*N*-Bz	ANP-9151	NEW!
O-DMT	A	*N,N*-DMF	ANP-9157	NEW!
O-DMT	C	*N*-Ac	ANP-9152	
O-DMT	G	*N*-iBu	ANP-9153	NEW!
O-DMT	G	*N,N*-DMF	ANP-9159	NEW!
O-DMT	U	n/a	ANP-9154	

Catalog #	Product Name	250mg	500mg	1gm	2gm	5gm
ANP-9151 NEW!	2'-Fluoro deoxy Adenosine (*N*-Bz) 3'-CEP, *M.W. 875.92*	$75	$135	$245	$435	$980
ANP-9157 NEW!	2'-Fluoro deoxy Adenosine (*N,N*-DMF) 3'-CEP, *M.W. 826.90*	$85	$155	$300	$580	$1,380
ANP-9152	2'-Fluoro deoxy Cytidine (*N*-Ac) 3'-CEP, *M.W. 789.83*	$55	$95	$190	$575	$750
ANP-9153 NEW!	2'-Fluoro deoxy Guanosine (*N*-iBu) 3'-CEP, *M.W. 857.91*	$75	$135	$245	$435	$980
ANP-9159 NEW!	2'-Fluoro deoxy Guanosine (*N,N*-DMF) 3'-CEP, *M.W. 842.89*	$85	$155	$300	$580	$1,380
ANP-9154	2'-Fluoro deoxy Uridine 3'-CEP, *M.W. 748.78*	$55	$95	$190	$575	$750



2'-Fluoro-2'- deoxy Nucleosides Supports with base Protection

5'	B	Protection	Catalog #	
O-DMT	A	*N*-Bz	N-1058	NEW!
O-DMT	A	*N,N*-DMF	N-1067	NEW!
O-DMT	C	*N*-Ac	N-1057	
O-DMT	G	*N*-iBu	N-1055	NEW!
O-DMT	G	*N,N*-DMF	N-1069	NEW!
O-DMT	U	n/a	N-1056	

Succinyl Icaa Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-1058-05	2'-Fluoro deoxy Adenosine (*N*-Bz)	500Å	$110	$145	$165	$295	$365
N-1058-10	3'-Icaa CPG	1000Å					
N-1067-05	2'-Fluoro deoxy Adenosine (*N,N*-DMF)	500Å	$110	$145	$165	$295	$365
N-1067-10	3'-Icaa CPG	1000Å					
N-1057-05	2'-Fluoro deoxy Cytidine (*N*-Ac)	500Å	$85	$105	$125	$210	$250
N-1057-10	3'-Icaa CPG	1000Å					
N-1055-05	2'-Fluoro deoxy Guanosine (*N*-iBu)	500Å	$110	$145	$165	$295	$365
N-1055-10	3'-Icaa CPG	1000Å					
N-1069-05	2'-Fluoro deoxy Guanosine (*N,N*-DMF)	500Å	$110	$145	$165	$295	$365
N-1069-10	3'-Icaa CPG	1000Å					
N-1056-05	2'-Fluoro deoxy Uridine	500Å	$85	$105	$125	$210	$250
N-1056-10	3'-Icaa CPG	1000Å					

2'-Fluoro nucleoside phosphoramidites:

A number of 2'-deoxy-2'-fluoro nucleosides have been found to display significant biological activity as nucleosides and as triphosphates, and are used as versatile probes for DNA and RNA polymerases (see review article; F. Viani, Chapter 13, pp 419-449, in Stereochemical Challenges and Biomedical Targets, Ed., V.A. Soloshonola, John Wiley & Sons Ltd., 1999 ; G.E. Wright, N.C. Brown, Pharmacol. Ther. 1990, 47, 447). The incorporation of the deoxyfluoronucleosides into oligonucleotides imparts very interesting biological properties to fluorinated oligomers (B.Reif ,V.Wittmann, H.Schwalbe, C. Griesinger, K.Jahn-Hofmann, J.W.Engels, Helv. Chim. Acta, 1997, 80, 1952).

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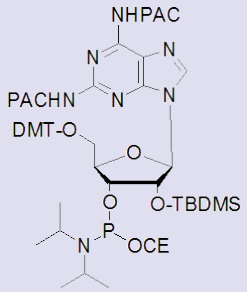
2,6-Diaminopurine-CEP

(2-Amino-2'-O-TBDMS Adenosine CEP)



$C_{62}H_{75}N_8O_{11}PSi$
Mol. Wt.: 1167.37

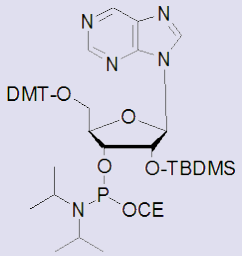
Catalog# ANP-8613

Pricing $325.00 / 100 µmole

Purity: 98% +

Purine Riboside CEP

(2'-O-TBDMS Purine Riboside CEP)



$C_{46}H_{61}N_6O_7PSi$
Mol. Wt.: 869.07

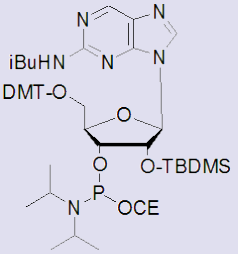
Catalog# ANP-8616

Pricing $385.00 / 100 µmole

Purity: 98% +

2-Amino Purine Riboside CEP

(2'-O-TBDMS 2-Amino Purine (N-iBu) Riboside CEP)



$C_{50}H_{68}N_7O_8PSi$
Mol. Wt.: 954.18

Catalog# ANP-8617

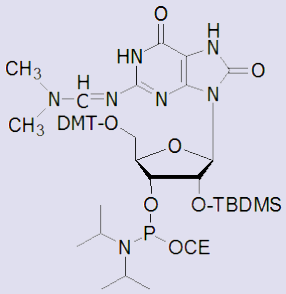
Pricing $370.00 / 100 µmole

Purity: 98% +

8-Oxo ribo Guanosine CEP

NEW!

(8-Oxo ribo Guanosine (N,N-DMF) CEP



$C_{49}H_{67}N_8O_9PSi$
Mol. Wt.: 971.16

Catalog# ANP-9420

Pricing $285.00 / 100 µmole
$800.00 / 250 mg

Purity: 99% +

2'-Succinyl Icaa Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-9040-05 N-9040-10	2-Amino Adenosine 2'-O-TBDMS 3'-Icaa CPG	500Å 1000Å	$120	$615	$95	$165	$190	$330
N-9070-05 N-9070-10	2-Amino Purine Riboside 2'-O-TBDMS 3'-Icaa CPG	500Å 1000Å	$120	$610	$95	$165	$190	$330
N-9080-05 N-9080-10	Purine Riboside 2'-O-TBDMS 3'-Icaa CPG	500Å 1000Å	$110	$610	$95	$165	$190	$330

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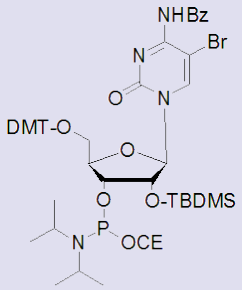
5-Bromo Cytidine CEP
(5-Bromo-2'-O-TBDMS Cytidine (*N*-Bz) CEP)



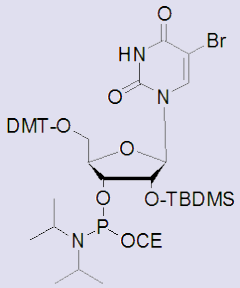
$C_{52}H_{65}BrN_5O_9PSi$
Mol. Wt.: 1043.06

Catalog# ANP-5648

Pricing
$135.00 / 100 µmole
$330.00 / 250 mg
$585.00 / 500 mg

Purity: 98% +

5-Bromo Uridine CEP
(5-Bromo-2'-O-TBDMS Uridine CEP)



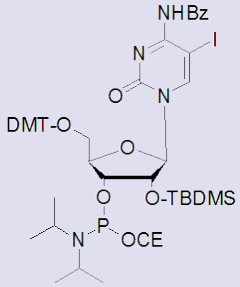
$C_{45}H_{60}BrN_4O_9PSi$
Mol. Wt.: 939.94

Catalog# ANP-7411

Pricing
$155.00 / 100 µmole
$350.00 / 250 mg

Purity: 98% +

5-Iodo Cytidine CEP
(5-Iodo-2'-O-TBDMS Cytidine (*N*-Bz) CEP)



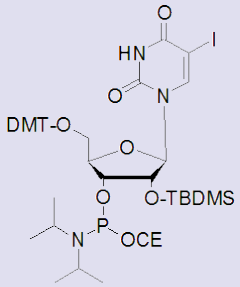
$C_{52}H_{65}IN_5O_9PSi$
Mol. Wt.: 1090.06

Catalog# ANP-7212

Pricing
$155.00 / 100 µmole
$330.00 / 250 mg

Purity: 98% +

5-Iodo Uridine CEP
(5-Iodo-2'-O-TBDMS Uridine CEP)



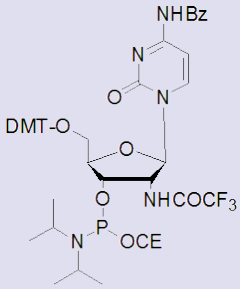
$C_{45}H_{60}IN_4O_9PSi$
Mol. Wt.: 986.94

Catalog# ANP-7412

Pricing
$155.00 / 100 µmole
$350.00 / 250 mg

Purity: 98% +

2'-Amino Cytidine CEP
(2'-Amino TFA Cytidine (*N*-Bz) CEP)



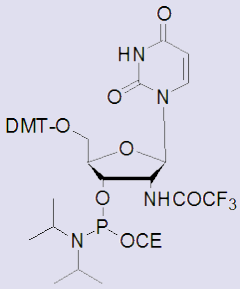
$C_{48}H_{52}F_3N_6O_9P$
Mol. Wt.: 944.93

Catalog# ANP-5322

Pricing
$250.00 / 100 µmole
$480.00 / 250 mg

Purity: 98% +

2'-Amino Uridine CEP
(2'-Amino TFA Uridine CEP)



$C_{41}H_{47}F_3N_5O_9P$
Mol. Wt.: 841.81

Catalog# ANP-9403

Pricing
$222.00 / 100 µmole
$428.00 / 250 mg

Purity: 98% +

Succinyl Icaa Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-9010-05	2'-Amino Uridine	500Å	$110	$610	$90	$155	$180	$310
N-9010-10	3'-Icaa CPG	1000Å						

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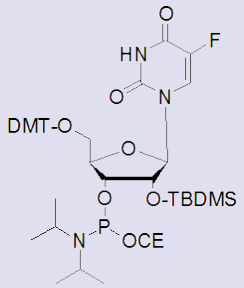
5-Fluoro Uridine CEP

(5-Fluoro 2'-O-TBDMS Uridine CEP)



$C_{45}H_{60}FN_4O_9PSi$
Mol. Wt.: 879.04

Catalog#

ANP-6154

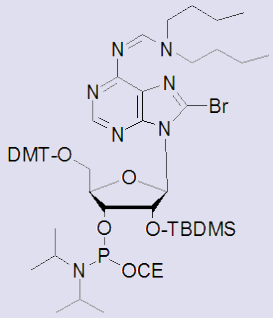
Pricing

$255.00 / 100 µmole
$480.00 / 250 mg

Purity: 98% +

8-Bromo Adenosine CEP

(8-Bromo-2'-O-TBDMS Adenosine (*N,N*-DBF) CEP)



$C_{55}H_{78}BrN_8O_7PSi$
Mol. Wt.: 1102.22

Catalog#

ANP-7111

Pricing

$115.00 / 100 µmole
$235.00 / 250 mg

Purity: 98% +

Halogenated Purines & Pyrimidines Supports Columns

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-9809-05	5-Iodo Uridine	500Å	$125	$550	$105	$120	$210	$240
N-9809-10	2'-*O*-TBDMS 3'-Icaa CPG	1000Å						
N-9818-05	5-Bromo Uridine	500Å	$125	$550	$105	$120	$210	$240
N-9818-10	2'-*O*-TBDMS 3'-Icaa CPG	1000Å						
N-9844-05	5-Bromo Cytidine (*N*-Bz)	500Å	$140	$580	$115	$130	$230	$260
N-9844-10	2'-*O*-TBDMS 3'-Icaa CPG	1000Å						
N-9812-05	8-Bromo Adenosine (*N,N*-DBF)	500Å	$150	$800	$130	$175	$260	$350
N-9812-10	2'-*O*-TBDMS 3'-Icaa CPG	1000Å						
N-9832-05	5-Fluoro Uridine	500Å	$125	$580	$105	$120	$210	$240
N-9832-10	2'-*O*-TBDMS 3'-Icaa CPG	1000Å						
N-9893-05	5-Iodo Cytidine (*N*-Bz)	500Å	$150	$800	$130	$175	$260	$350
N-9893-10	2'-*O*-TBDMS 3'-Icaa CPG	1000Å						

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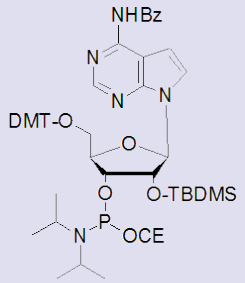
7-Deaza Adenosine CEP

(7-Deaza-2'-O-TBDMS Adenosine (*N-Bz*) CEP)



$C_{54}H_{67}N_6O_8PSi$
Mol. Wt.: 987.20

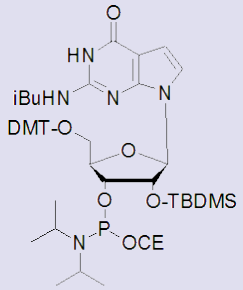
Catalog# ANP-7101

Pricing $315.00 / 100 µmole

Purity: 98% +

7-Deaza Guanosine CEP

(7-Deaza-2'-O-TBDMS Guanosine (*N-iBu*) CEP)



$C_{51}H_{69}N_6O_9PSi$
Mol. Wt.: 969.19

Catalog# ANP-7301

Pricing $355.00 / 100 µmole

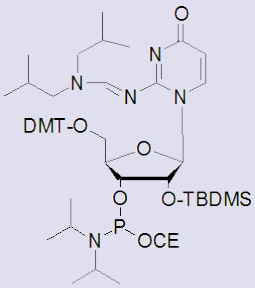
Purity: 98% +

7-Deaza 2'-Succinyl Icaa Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-9897-05 N-9897-10	7-Deaza Adenosine (*N*-Bz) 2'-*O*-TBDMS 3'-Icaa CPG	500Å 1000Å	$95	$685	$110	$190	$220	$380
N-9895-05 N-9895-10	7-Deaza Guanosine (*N*-iBu) 2'-*O*-TBDMS 3'-Icaa CPG	500Å 1000Å	$95	$685	$100	$190	$220	$380

isoCytidine CEP

(isoCytidine (*N,N*-DIBF) CEP)



$C_{54}H_{79}N_6O_8PSi$
Mol. Wt.: 999.30

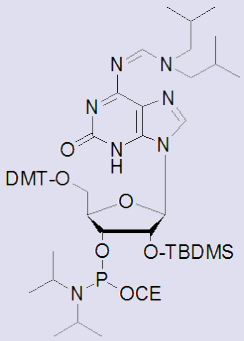
Catalog# ANP-7715

Pricing $370.00 / 100 µmole

Purity: 98% +

isoGuanosine CEP

(isoGuanosine (*N,N*-DIBF) CEP



$C_{55}H_{75}N_8O_{10}PSi$
Mol. Wt.: 1067.29

Catalog# ANP-5988

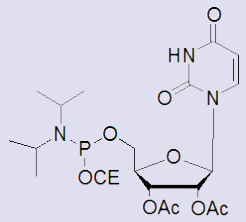
Pricing $370.00 / 100 µmole

Purity: 98% +

isoC & isoG 2'-Succinyl Icaa Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-9712-05 N-9712-10	iso-Cytidine (*N,N*-diisobutyl-formamidine) 3'-Icaa CPG	500Å 1000Å	$155	$810	$120	$145	$240	$290
N-9827-05 N-9827-10	iso-Guanosine (*N,N*--iBuDmf) 2'-*O*-TBDMS 3'-Icaa CPG	500Å 1000Å	$155	$810	$120	$150	$240	$300

2',3'-Diacetyl Uridine 5'-CEP



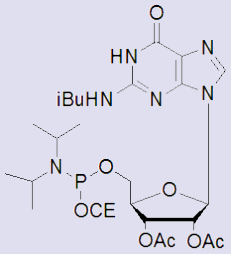
$C_{22}H_{33}N_4O_9P$
Mol. Wt.: 528.49

Catalog#
ANP-6155

Pricing
$80.00 / 100 µmole
$175.00 / 250 mg

Purity: 98% +

2',3'-Diacetyl Guanosine (*N*-iBu) 5'-CEP



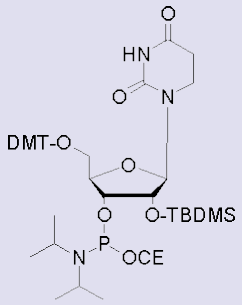
$C_{27}H_{40}N_7O_9P$
Mol. Wt.: 637.62

Catalog#
ANP-6156

Pricing
$90.00 / 100 µmole
$190.00 / 250 mg

Purity: 98% +

5'-DMT-2'-TBDMS-5,6-dihydro Uridine 3'-CEP



$C_{45}H_{61}N_4O_9PSi$
Mol. Wt.: 861.05

Catalog#
ANP-6066

Pricing
$80.00 / 100 µmole
$175.00 / 250 mg

Purity: 98% +

Dihydrouridine Phosphoramidite

Dihydrouridine, along with a large number of other modified nucleosides are present abundantly in tRNA, mRNA, shRNA, rRNA and other RNAs[1]. The catabolic degradation of uridine or the uracil moiety leads to dihydrouridine and enzyme dihydropyrimidine dehydrogenase is involved[2]. The oligonucleotides containing this base seem to be crucial in understanding the regulation of enzymes involved in the pathway.

1. Limback, P.A., Crain, P.F., & McCloskey, J.A., Nucl. Acids Res., 22,12, 2183-2196, 1994.
2. Gojkovic, Z., Rislund, L,, Andersen,B., Sandrini, M.P.B., Cook, P.F., Schnackerz, K.D., Piskur, J., Nucl. Acids Res., 31, 6, 1683-1692, 2003.

Terminal Diol Generating Reagents

2',3'-Diacetyl-5'-phosphoramidites are available from ChemGenes for the introduction of 2',3'-ribose units at the 5'-end of oligonucleotides. Following ammonia deprotection, the 2',3'-diacetate generates a free ribose 2',3'-diol moiety in the oligonucleotide.

Periodate cleavage of these diols generates dialdehydes *(N. F. Krynetskaya, G. V. Zayakina, T. S. Oretskaya, E. M. Volkov, Z. A. Shabarova, Nucleo. Nucleot., 5, 33, 1986)*. These dialdehydes have been stabilized by amines, especially by terminal amino groups of lysine residue of proteins or polypeptides *(J. X. Khym, Biochemistry, 2, 344, 1963)*. Such oligonucleotide-protein conjugates have been utilized in immuno-assay and diagnostic applications.

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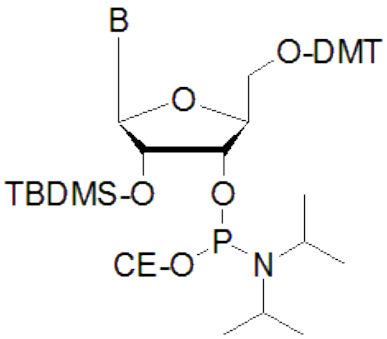

ß-L-RNA Phosphoramidites

5'	B	Protection	Catalog#
O-DMT	A	*N*-Bz	ANP-4841
O-DMT	C	*N*-Bz	ANP-4842
O-DMT	G	*N*-iBu	ANP-4843
O-DMT	T	n/a	ANP-4844
O-DMT	U	n/a	ANP-4845
O-DMT	C	*N*-Ac	ANP-4846

Catalog#	Product name	250mg	500mg	1gm	2gm	5gm
ANP-4841	ß-L-Adenosine (*N*-Bz) 2'-*O*-TBDMS-3'-CEP, *M.W. 988.19*	$180	$325	$600	$1,152	$2,765
ANP-4842	ß-L-Cytidine (*N*-Bz) 2'-*O*-TBDMS-3'-CEP, *M.W. 964.17*	$180	$325	$600	$1,152	$2,765
ANP-4843	ß-L-Guanosine (*N*-iBu) 2'-*O*-TBDMS-3'-CEP, *M.W. 970.18*	$180	$325	$600	$1,152	$2,765
ANP-4844	ß-L-Thymidine 2'-*O*-TBDMS-3'-CEP, *M.W. 875.07*	$180	$325	$600	$1,152	$2,765
ANP-4845	ß-L-Uridine 2'-*O*-TBDMS-3'-CEP, *M.W. 861.05*	$180	$325	$600	$1,152	$2,765
ANP-4846	ß-L-Cytidine (*N*-Ac) 2'-*O*-TBDMS-3'-CEP, *M.W. 902.10*	$180	$325	$600	$1,152	$2,765

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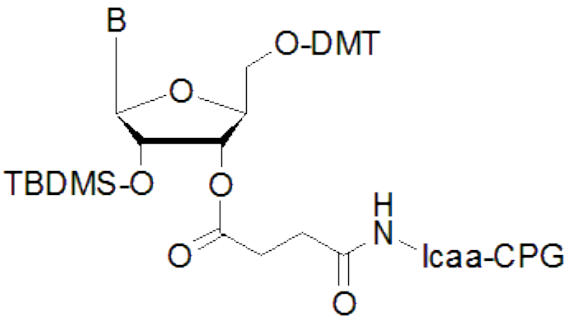

ß-L-RNA Icaa Supports

5'	B	Protection	Catalog #
O-DMT	A	*N*-Bz	N-4691
O-DMT	C	*N*-Bz	N-4692
O-DMT	G	*N*-iBu	N-4693
O-DMT	U	n/a	N-4694
O-DMT	T	n/a	N-4695
O-DMT	C	*N*-Ac	N-4696

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	500 mg	1 gm	pack of 4 cols. 0.2 µmole	1.0 µmole	pack of 10 cols. 0.2 µmole	1.0 µmole
N-4691-05	ß-L-Adenosine (*N*-Bz)	500Å	$135	$425	$850	$110	$125	$220	$250
N-4691-10	2'-*O*-TBDMS-3'-Icaa CPG	1000Å							
N-4692-05	ß-L-Cytidine (*N*-Bz)	500Å	$135	$425	$850	$110	$125	$220	$250
N-4692-10	2'-*O*-TBDMS-3'-Icaa CPG	1000Å							
N-4693-05	ß-L-Guanosine (*N*-iBu)	500Å	$135	$425	$850	$110	$125	$220	$250
N-4693-10	2'-*O*-TBDMS-3'-Icaa CPG	1000Å							
N-4694-05	ß-L-Uridine	500Å	$135	$425	$850	$110	$125	$220	$250
N-4694-10	2'-*O*-TBDMS-3'-Icaa CPG	1000Å							
N-4695-05	ß-L-ribo Thymidine	500Å	$135	$425	$850	$110	$125	$220	$250
N-4695-10	2'-*O*-TBDMS-3'-Icaa CPG	1000Å							
N-4696-05	ß-L-Cytidine (*N*-Ac)	500Å	$135	$425	$850	$110	$125	$220	$250
N-4696-10	2'-*O*-TBDMS-3'-Icaa CPG	1000Å							

* Currently we are offering 2'-O-TBDMS-3'-Icaa CPG Products instead of 3'-O-TBDMS-2'-Icaa CPG

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Purification of synthetic RNA

RNA purification is significantly more difficult than DNA purification due to possible chain cleavage and isomerization of the internucleotide phosphate linkage. Several methodologies for deprotection and purification have been developed.

Small Quantity Purification

The first step following the synthesis of oligonucleotides involves a base treatment to remove the N-protecting and cyanoethyl groups. For base deprotection, both 28% aqueous ammonia containing ethanol (1:3) and anhydrous saturated ethanolic ammonia solutions have been used. The latter was found to be superior in preventing the loss of any silyl groups (S. A. Scaringe, C. Francklyn, N. Usman, Nucl. Acids Res., 18, 5433, 1990). It has been reported that a certain amount of silyl groups will be lost when using the former ammonia solution (J. Stawinski, R. Stromberg, M. Thelin, E. Westman, Nucl. Acids Res.,16, 9285, 1988).

The second step in the deprotection process involves removal of silyl protecting groups (TBDMS).This has been accomplished by 1.0 M solution of tetrabutylammoniumfluoride (TBAF) in THF. The reaction involves 50 equivalents of TBAF per TBDMS group during 24 hours. Even though initially deemed adequate, this method is slow and still leaves some TBDMS groups on the oligonucleotide. Much better results have been obtained with triethylamine-tris-hydrofluoride (TEA.3HF). In the synthesis of 76-mer tRNA the reaction with neat TEA.3HF for 14 hours resulted in complete removal of all TBDMS groups (D. Gasparutto,D., Livache,T.,Bazin, H., Duplaa, A.-M.,Guy M., Khorlin,A., Molko,D., Roget A., Toule, R., Nucl. Acids Res., 20,5159, 1992). The faster rate of silyl removal with TEA.3HF has been demonstrated by others (B. Sproat, F. Colonna, B. Mullah, D. Tsou, A. Andrus, A. Hampel, R. Vinayak, Nucleosides & Nucleotides, 14, 255, 1995).

Example of Oligonucleotide Purification using 2'-O-TBDMS-N- (Abz ; G ibu; Cac & U)- protected RNA monomers:

A summary of procedures is outlined below. Detailed protocols are available, with the products supplied to customers.

Caution: Only de-ionized RNase, pyrogen, nucleases and bacteria free water and filtered through a membrane with a filter unit capable of high molecular weight cut off should be used (preferably Millipore unit) for manipulations involving subsequent steps. Similarly all buffers to be used require this quality of water.

Deprotection Procedures:

Methyl Amine Deprotection: Support Cleavage and base deprotection with methyl amine (MA; 40% methylamine in water; 1.0 ml), followed by Triethylamine:3HF deprotection of silyl protecting group and subsequent precipitation with n- butanol, cooling at -70 C, followed by centrifugation at 8000 RPM, removal of supernatant. The solid later dissolved in 0.1 M TEAA buffer (pH; 7.5), filtered through 0.45 micron filter and HPLC purification is carried out.

AMA Deprotection: Support cleavage and base deprotection with ammonium hydroxide : methylamine (AMA; 1:1; 1.5 ml), at different time intervals depending on sequence length. Treatment of base deprotected oligo, as dried powder with triethylamine salt. Subsequent quenching of fully deprotected oligonucleotide with 50 mM TEAB, cooling at -70C and precipitation with n- butanol. The precipitated oligo dissolved in 0.1 M TEAA buffer (pH; 7.5), and filtered through 0.45 micron filter and carrying out HPLC purification.

Puripak Cartridge (ChemGenes Cat # CSS-5232) Purification: The oligo (from 1.0 uM synthesis) dissolved in 0.1 M TEAB (pH; 7.5), charged on to appropriate size cartridge, eluted by applying a gentle pressure successively with 0.1M, 0.5 M and 1.0 M buffer, collecting 3-4 fractions in each buffer; each fraction being 5 ml. From the fractions small volume dried 3 times with 50:50:: ethanol : water on rotary evaporator to remove buffer salt. UV, CE analysis of the fractions to be performed to determine purest fractions. The desired fractions after CE and UV analysis then coevaporation with 50:50:: ethanol:water. Generally RNA is present in 0.5 M buffer fraction (shorter length oligos) or in 1.0 M buffer (longer sequences such as 20-mer and above). The thin film of RNA is taken in 0.1 M TEAA and precipitated with 1.0M solution of sodium perchlorate in acetone. The precipated oligonucleotide is centrifuged.

HPLC Purification: After deprotection and precipitation of crude oligo or oligo obtained after cartridge purification (depending on purity) is subsequently purified by HPLC. Brief conditions of purification of synthetic RNA's are as follows:

Anion –exchange -DNAPac PA-100 (4X250 nm Dionex Column) .

Mobile Phase: Eluants; 2mM Tris.HCl (pH 7.4), 10 mm NaClO4, 6 M urea; & 2 mM Tris. HCl (pH 7.4), 0.55 M NaClO4, 6 M urea; (Purification of Long chain RNA's; S.Pitch et.al., Helv. Chim. Acta, 84, 3773, 2001).

Source 15TM Q resin columns** (Ion- Exchange) Purification: Manufacturer-GE

Eluants: 0.5 M Tris :Acetonitrile: water ::10:10:80 (Buffer A) & 1.5 M NaCl in Buffer A (Buffer B). **Source Q is a Trade mark of GE Health Care.

Mono Q HR 10/10 column (GE Health Care):

with NaClO4 gradient in Tris buffer (pH 6.8); Eluants: 0.1 M KH2PO4, pH 6.4, 0.05 M NaCl & Eluant B: 0.1 M KH2PO4, pH 6.4, 0.9 M NaCl as well as Eluants: 0.01 M NaClO4, 20 mM Tris HCl, pH 6.8 & 0.6 M NaClO4, 20 mM Tris-HCl, pH , 6.8, containing 10% acetonitrile (Mikhailov, S.N., Rozensski,J.,Efimtseva, E.V., Busson, R., Aerschot, A.V., Herdewijn,P., Nucl. Acids Res., 30,1124-1131,2002); RNA's containing N-1 methyl adenosine base were separated.

Desalting: Fractions obtained after HPLC are desalted by; (a) loading on C18 Sep Pak cartridge (Waters/Millipore), (R. Micura etal, NAR, 2000), (b) ChemGenes Cartridges (CSS-5232), (c) NAP25 columns. After desalting the desired fractions are converted into sodium salt with sodium perchlorate.

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RNA Purification Kit
(for Synthetic RNA via 2'-O-TBDMS Protection)

A double advantage with ChemGenes: Offering the highest purity RNA monomers and Deprotection & Purification Kits.

With ChemGenes purification kits and products you can now synthesize and obtain a high quality of pure synthetic RNA. ChemGenes RNA purification kits include all the solutions and buffers required to obtain a high quality of synthetic RNA.

Catalog #	Quantity	Prices
CSS-5232-02	1 Kit	$140.00 / 0.2 um
CSS-5232-10	1 kit	$192.00 / 1.0 um

The RNA Purification kit consist of the Following:

- CSS-3268 (10 ml)
- CSS-5272 (pack of 10)
- CSS-6634 (50 ml)
- CSS-5232 (25 ml)

Anhydrous Ammonia in Ethanol Solution

(20% ammonia by wieght in absolute ethanol)
NH_3 F.W.: 17
C_2H_6O. F.W.: 46.07

Catalog #	Quantity	Prices
CSS-3268	10 ml	$35.00

Ideal for selective deprotection of the base protecting groups and the cynoethyl groups and preventing chain cleavage isomerization of 3'-5' phosphordiester bond in the final RNA.
(ref: *Taifeng Wu, Kelvin K. Ogilive, Richard T. Pon, Nucl. Acids Res., 17, 3501 1989.*)

RNA Purification Cartridges

Catalog #	Quantity	Prices
CSS-5272-02	pack of 10	$ 60.00 / 0.2 um
CSS-5272-10	pack of 10	$125.00 / 1.0 um

The RNA purification cartridges are designed for the purification of short to medium length RNA oligonucleotides. The seperation of different length oligos is based on charges on the ion-exchenge media in the cartridges. They achieve excellent purification of the oligonucleotide.

Tetra Butyl Ammonium Fluoride(TBAF)

(1M Solution in Tetrahydrofuran)
$C_{16}H_{38}FN$
F.W.: 261.47

Catalog #	Quantity	Prices
CSS-4356	25 ml	$30.00

Used to remove Silyl-protecting groups after the oligonucleotide synthesis.
Moisture Content adjusted for optimum silyl group removal.

Fluoride Ion Removal Solution

Catalog #	Quantity	Prices
CSS-6634	50 ml	$50.00

This is used to remove all the fluoride and organic bye products after tetra butyl ammonium fluoride step in RNA deprotection.

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Chromophores & Ligands

ChemGenes offers a variety of chromphores and ligands for developing modified synthetic oligonucleotides conjugated with reporter molecules which can be employed in hybridization-based assays. Such oligonucleotides have broad applications in both basic molecular biology research and in clinical diagnostics and screening, because they have high specificity to a target nucleic acid sequence.

Ligands for attachment Chemistries

A wide variety of ligands are available from ChemGenes. The most common modification used for selective oligonucleotide attachment is the alkyl amino group. We offer from C-3 to C-12 spacer amino modifiers. This modification can be introduced into an oligonucleotide by using the corresponding phosphoramidite building block with the protected alkyl amine, which enabled for the reaction with activated esters after removal of the protecting group.[1,2]

Amongst various other chemistries available in literature by different approaches such as introduction of the desired alkyl amino function by aminolysis of the ester bond by diamino alkanes.[3,4] The reaction of alkyl amino modified oligonucleotides and activated esters affords the amide covalent bond between an oligonucleotide and molecule of interest. Similarly hydrazides have been used in selective reaction with active esters. That type of nucleophilic modifications attached to the oligonucleotides and some of their applications have been recently reported in the literature.[5,6] It also has been shown that hydrazide forms a stable Schiff base in the reaction with aldehydes and for some applications does not require reduction into stable alkyl hydrazide by cyanoborohydride.[7]

Sulfhydryl modification reagents and supports are offered by us. This is a very efficient functionality utilized in the Michael-addition and nucleophilic substitution reactions with different electrophiles. It was successfully employed in chemoselective bio-molecule conjugations.[8,9] That modification can be introduced by several thioate and disulfide containing phosphoramidites and solid supports sold by us.

References

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2. Coull, J. M.; Weith, H. L.; and Bischoff, R. *Tetrahedron Lett.* **1986**, *27,* 3991-3994.
3. Hovinen, J.; Gusaev, A.; Azhaev, A. and Lönnberg, H. *J. Chem. Soc. Perkin Trans. I,* **1994**, 2745-2749.
4. Azhaeva, E.; Azhaev, A.; Gusaev, A.; Hovinen, J. and Lönnberg, H. *Nucl. Acid Res.* **1995***, 23*, 1170-1176.
5. Ghosh, S. S.; Kao, P. M.; Kwoh, D. Y. *Analytical Biochemistry* **1989**, *178,* 43-51.
6. Raddatz, S.; Mueller-Ibeler, J.; Kluge, J.; Wäß, L.; Burdinski, G.; Havens, J. R.; Onofrey, T. J.; Wang, D. and Schweitzer, M. *Nucl. Acid Res.* **2002**, *30*, 4793-4802.
7. Podyminogin, M. A.; Lukhtanov, E. A. and Reed, M. W. *Nucl. Acid Res.* **2001**, *29*, 5090-5098.
8. Jablonski et al. *Nucl. Acid Res.***1986***, 14*, 6115.
9. Farmer, G. J. ; Castenada, M. *Biotechniques*, **1991**, *11*, 588.

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Summary of Chromophore & Ligand Modified Phosphoramidites

The incorporation of the chromophores and lingands are summarized below:

Phosphate Introducing Reagents

Bis- Cyanoethyl-*N,N*-diisopropyl Amidite and Phosphate-ON (generates DMT color) Reagents

Amino Linkers

Includes TFA -Amino C-4, TFA-Amino C-5, TFA-Amino C-6, MMT-Amino C-6, dC *N4* -Amino Linker, MMT-Amino C-12, TFA-Amino C12, Amino-dT C-6, & Fmoc-Amino-DMT C-3 Amidites and various supports

Spacers

Includes C-2 Spacer, C-3 Spacer, C-4 Spacer, C-6 Spacer, C-9 Spacer, C-12 Spacer, Spacer 9, Spacer 12, Spacer 18, Polyethyleneglycol 2000, and Polyethyleneglycol 4500

5' -Thiol & 3' -Thiol Modifiers

Includes 5'-Thio Modifier Hexyl, 5'-Thiol C-3 Disulfide , and 5' Thiol C-6 Disulfide amidites and 3'-Thiol Modifier C-6 support.

Biotin

Including Biotin BB, Biotin Phosphoramidites

Branching Amidites and Supports

Asymmetrical and Symmetrical Branching, Glyceryl CPG, & Butanol CPG

Carboxy Introduction and Cholesterol

Including Thymidine-succinyl Hexamide Amidite, deoxy Uridine 5-methylacrylate Amidite, Cholesterol TEG(generating DMT-orange color), TEG Cholesterol, & Cholesterol Support.

Dabcyl and DNP-TEG

Including Dabcyl Amidites and Support ,Thymidine C-5 Dabcyl Amidite, and DNP-TEG Amidites

Etheno Amidites & Supports

Includes Psoralen Amidites, Psoralen C-2, Psoralen C-4, Psoralen C-6, Psoralen Hexaethyloxyglycol, and Psoralen CPG

HEX,TET,6-FAM , 5-FAM, Fluorescein dT, and Tetrachloro, Hexachloro Fluorescein Cyclohexyl Amidites & Supports

Includes N4 6-TAMRA Amidites and Support & 5-TAMRA Amidite

Psoralen Amidites & Supports

Includes Psoralen Amidites, Psoralen C-2, Psoralen C-4, Psoralen C-6, Psoralen Hexaethyloxyglycol, and Psoralen CPG

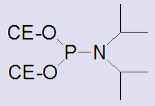
TAMRA Amidites & Supports and Cocktail for TAMRA

Includes *N4* 6-TAMRA Amidites and Support & 5-TAMRA Amidite

Oligo Synthesis Products

Phosphoramidites and Supports for Introducing Chromophores & Ligands

5'- Phosphorylation
(Bis-cyanoethyl-N,N-diisopropyl CEP)



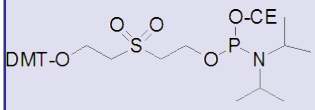
$C_{12}H_{22}N_3O_2P$
Mol. Wt.: 271.30

Catalog#
CLP-1454

Pricing
$ 40.00 / 100 µmole
$ 50.00 / 250 mg
$ 65.00 / 500 mg
$110.00 / 1 gm

Purity: 98% +

5-Phosphorylation (generates DMT color)
(5-Phosphate-ON Reagent)



$C_{34}H_{45}N_2O_7PS$
Mol. Wt.: 656.77

Catalog#
CLP-1544

Pricing
$ 45.00 / 100 µmole
$150.00 / 250 mg

Purity: 98% +

Phosphate-ON Succinyl Icaa Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-9977-05	3'-Phosphate-ON	500Å	$62	$425	$52	$92	$104	$184
N-9977-10	Icaa CPG	1000Å						

Oligonucleotides can be phosphorylated enzymatically at the 5'-terminus by polynucleotide kinase. This reaction is reversible and is difficult to control. For applications such as gene assembly, where complete phosphorylation is important, it is advisable to introduce the phosphate chemically.

ChemGenes offers two reagents for 5'-phosphorylation of an oligonucleotide:

- The bis-cyanoethyl-N,N-diisopropyl phosphoramidite (catalog #: CLP-1454) quantitatively phosphorylates the 5'-hydroxyl group via phosphoramidite methodology on an automatic DNA/RNA synthesizer.
- An alternative is the 5'-Phosphate-ON Reagent (catalog #: CLP-1544) which generates a "DMT orange color" after introduction of phosphate at the last nucleotide in the oligonucleotide chain.

Description:

Bis-Cyanoethyl-N,N-diisopropyl CEP is used for the introduction of 5'- terminal phosphate on a synthetic DNA/RNA via phosphoramidite chemistry on an automatic DNA Synthesizer to produce probes and primers carrying 5'-phosphate. This is an ideal reagent for the production of phosphorylated DNA or RNA oligomers in large quantity, as compared to enzymatic phosphorylation at this position, which has limitations with respect to the quantities. This becomes a significant factor when large quantities of phosphorylated oligomers are required for recombinant DNA applications. The bis-cyanoethyl phosphoramidite reagent has the disadvantage of not generating any color, however due to its lower price it is the reagent of choice for the production of phophorylated DNA or RNA oligomers in large quantities

5-Phosphate-ON-reagent is an alternative to Bis-cyanoethyl phosphorylating reagent, outlined above.
This reagent generates DMT orange color after introduction of phosphate at the last nucleoside in the oligonucleotide chain.

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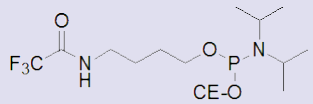
TFA-Amino C-4 CEP



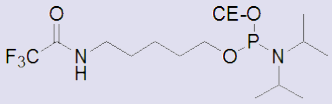
$C_{15}H_{27}F_3N_3O_3P$
Mol. Wt.: 385.36

Catalog#
CLP-1453

Pricing
$ 48.00 / 100 µmole
$150.00 / 250 mg

Purity: 98% +

TFA-Amino C-5 CEP



$C_{16}H_{29}F_3N_3O_3P$
Mol. Wt.: 399.39

Catalog#
CLP-1357

Pricing
$30.00 / 100 µmole
$90.00 / 250 mg

Purity: 98% +

TFA-Amino C-6 CEP

$C_{17}H_{31}F_3N_3O_3P$
Mol. Wt.: 413.42

Catalog#
CLP-1553

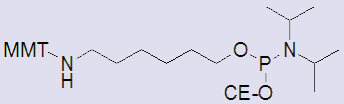
Pricing
$30.00 / 100 µmole
$90.00 / 250 mg

Purity: 98% +

MMT-Amino C-12 CEP & TFA-Amino C-12 CEP

For MMT -Amino C-12 and TFA -Amino C-12
Please see Page 75.

MMT-Amino C-6 CEP



$C_{35}H_{48}N_3O_3P$
Mol. Wt.: 589.75

Catalog#
CLP-1563

Pricing
$ 60.00 / 100 µmole
$175.00 / 250 mg

Purity: 98% +

Please Indicate Synthesizer when Ordering

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

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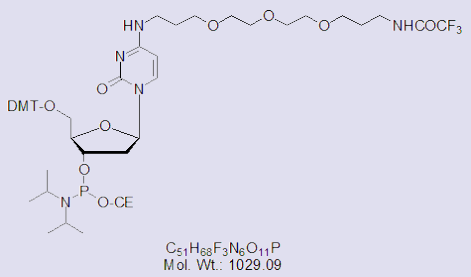
deoxy Cytidine N^4 Amino Linker CEP



Catalog#

CLP-1329

Pricing

$115.00 / 100 µmole
$235.00 / 250 mg

Purity: 98% +

5'-Terminal Amino Introducing Reagents

The standard DNA synthesis protocol and coupling protocol are followed to quantitatively generate the primary aliphatic amino group. This primary aliphatic Amino group is useful for the subsequent introduction of various chromophores via the following:

- Biotin
- Fluorescent molecules
- Alkaline phosphatase enzyme, etc.

These products are suitable for direct introduction of a primary aliphatic amino function into a synthetic oligonucleotide. The primary aliphatic amino group reacts very smoothly with a wide variety of labeling reagents; thus it is the chemical modification of choice for this application. Covalently linked chromophores can be readily obtained in a synthetic DNA or RNA of interest. *(P. S. Nelson, R.S. Gold, R. Leon, Nucl. Acids Res, 17, 7179 1989)*.

The 5'-Terminal Amino Introducing Reagent with C-4 Spacer (TFA-amino C-4, Catalog # CLP-1453) allows only for a single primary amino function per molecule. The amino group is introduced while protected as trifluoroacetamido which is cleaved during ammonia deprotection of the oligo. The amino group is separated from the 5'-phosphate of an oligonucleotide by four carbon atoms. The 5'-Terminal Amino Introducing Reagent with C-6 Spacer (TFA amino-C-6 phosphoramidite, catalog #: CLP-1553) is similarily introduced as the trifluoracetamido but allows for introduction of a C-6 spacer between the 5'-hydroxyl and the terminally introduced primary amino group.

Please Indicate Synthesizer when Ordering

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

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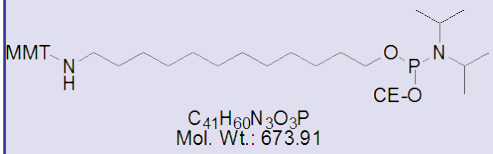
MMT-Amino C-12 CEP



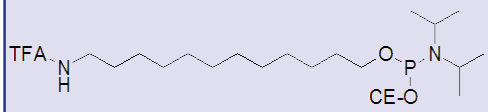
$C_{41}H_{60}N_3O_3P$
Mol. Wt.: 673.91

Catalog#
CLP-1585

Pricing
$90.00 / 100 µmole
$275.00 / 250 mg

Purity: 98% +

TFA-Amino C-12 CEP



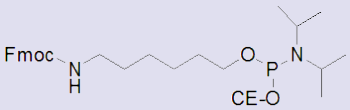
$C_{23}H_{43}F_3N_3O_3P$
Mol. Wt.: 497.57

Catalog#
CLP-1575

Pricing
$90.00 / 100 µmole
$275.00 / 250 mg

Purity: 98% +

Fmoc-Amino C-6 CEP



$C_{30}H_{42}N_3O_4P$
Mol. Wt.: 539.65

Catalog#
CLP-1586

Pricing
$90.00 / 100 µmole
$275.00 / 250 mg

Purity: 98% +

MMT-Amino C-6 & C-12

The 5'-Terminal Introducing Reagent with C-6 Spacer (MMT-amino-C-6-phosphoramidite, calatog #: CLP-1563) and the 5'-Terminal Amino Introducing Reagent with C-12 Spacer (MMT-amino-C-6 phosphoramidite, catalog CLP-1585) are used to introduce a primary amino group at the 5'-terminal of an oligonucleotide. The MMT on the amino function is cleaved with 3% trichloracetic acid (TCA), similar to DMT removal in oligonucleotide synthesis. However, the MMT-group removal is significantly slower (12 minutes contact with TCA).

A useful utilization of MMT protected C-6 and C-12 phosphoramidites involves the selective cleavage of the MMT group from the synthesized oligonucleotide to obtain the free terminal amino function while the oligo is still bound to the solid support. Various chomophores can be coupled to the terminal amino group of the support bound oligonucleotide. The excess reagent (chromophores) can easlily be washed off, thus leaving almost pure chomophore-oligonucleotide conjugates.

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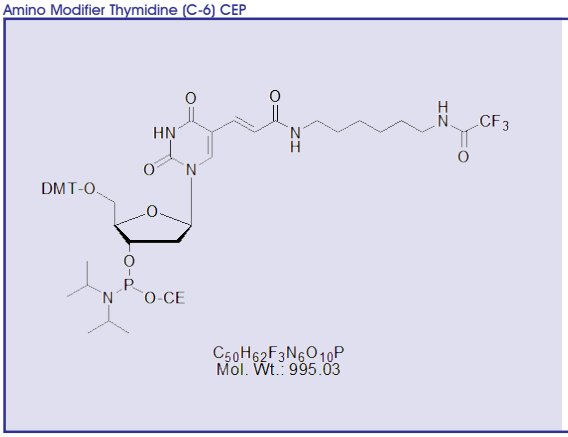
Oligo Synthesis Products

Phosphoramidites and Supports for Introducing Chromophores & Ligands

Amino-dT (C-6)

Amino Modifier Thymidine (C-6) CEP



Catalog#

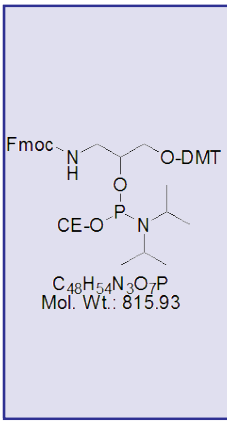
CLP-1501

Pricing

$175.00 / 100 µmole
$352.00 / 250 mg
$675.00 / 500 mg

Purity: 98% +

Fmoc-Amino-DMT C-3 CEP



Catalog#

CLP-1661

Pricing

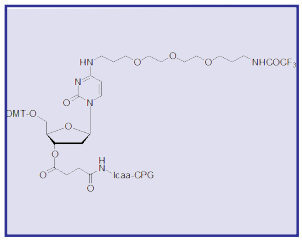
$ 48.00 / 100 µmole
$ 65.00 / 250 mg
$100.00 / 500 mg

Purity: 98% +

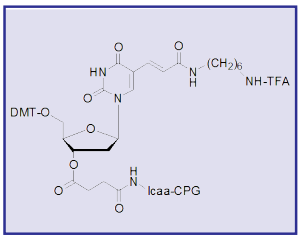
Amino Introducing Reagent with C-3 Spacer & Amino-dT (Fmoc-amino-DMT C-3 phosphoramidite)

The amino introducing reagent with C-3 Spacer (Fmoc-amino-DMT C-3 phosphoramidite, catalog #: CLP-1661) has a DMT group in additon to the protected primary amino group. This DMT group facilitates monitoring the efficiency of the phosphoramidite coupling and also allows multiple additions of the amino function. The amino dT, with a spacer arm of 10 atoms, is suitable for the internal labeling of oligonucleotides.

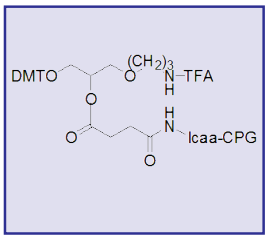
Supports & Columns for 3′-amino linker oligonucleotides



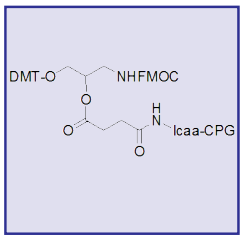
N-6052-05/10



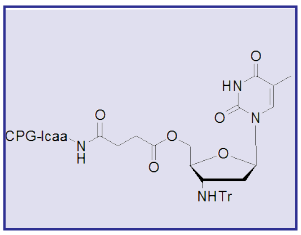
N-6054-05/10



N-1004-05/10



N-9750-05/10



N-8024-05/10

Supports & Columns for 3′-amino linker oligonucleotides

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 250 mg	Bulk CPG 1 gm	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-1004-05	TFA Amino C-6	500Å	$140	$180	$585	$120	$180	$240	$360
N-1004-10	Icaa CPG	1000Å							
N-9750-05	3'-Amino Modifier C-3	500Å	$140	$150	$550	$88	$112	$176	$224
N-9750-10	Icaa CPG	1000Å							
N-6052-05	deoxy Cytidine N^4-Amino Linker	500Å	$140	$170	$570	$110	$170	$220	$340
N-6052-10	3'-Icaa CPG	1000Å							
N-6054-05	Amino-dT (C-6)	500Å	$140	$170	$570	$110	$170	$220	$340
N-6054-10	3'-Icaa CPG	1000Å							
N-8024-05	3'-Amino trityl Thymidine	500Å	$140	$170	$570	$110	$170	$220	$340
N-8024-10	5'-Icaa CPG	1000Å							

3'Amino Modifier

The 3'-Amino Modifer TFA-C-6 (Catalog #: N-1004) has been found to be a very useful addition to 3'-amino linked DNA/RNA chimeras and micro RNA (Lagos-Quintana et. al., Current Biology, 12, 735-739 2002).

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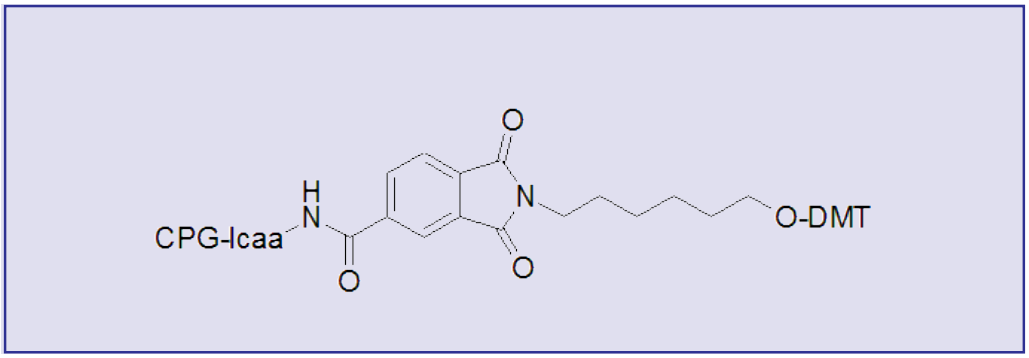
3'-Amino-Phtalamido Modifier CPG



Supports & Columns for 3'-amino linker oligonucleotides

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 250 mg	Bulk CPG 1 gm	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-8217-05	3'-Amino C-6 Phatalamido	500Å	$140	$180	$585	$120	$180	$240	$360
N-8217-10	Icaa CPG	1000Å							

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ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

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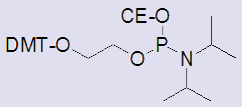
DMT-Ethane-Diol Phosphoramidite
(C-2 Spacer)



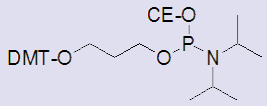
$C_{32}H_{41}N_2O_5P$
Mol. Wt.: 564.65

Catalog# CLP-2250

Pricing
$ 80.00 / 100 µmole
$150.00 / 250 mg

Purity: 98% +

DMT-Propane-Diol Phosphoramidite
(C-3 Spacer)



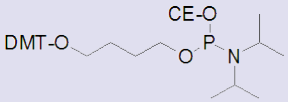
$C_{33}H_{43}N_2O_5P$
Mol. Wt.: 578.68

Catalog# CLP-9908

Pricing
$ 80.00 / 100 µmole
$150.00 / 250 mg

Purity: 98% +

DMT-Butane-Diol Phosphoramidite
(C-4 Spacer)



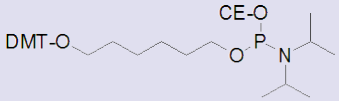
$C_{34}H_{45}N_2O_5P$
Mol. Wt.: 592.71

Catalog# CLP-9775

Pricing
$ 80.00 / 100 µmole
$150.00 / 250 mg

Purity: 98% +

DMT-Hexane-Diol Phosphoramidite
(C-6 Spacer)



$C_{36}H_{49}N_2O_5P$
Mol. Wt.: 620.76

Catalog# CLP-1120

Pricing
$ 80.00 / 100 µmole
$150.00 / 250 mg

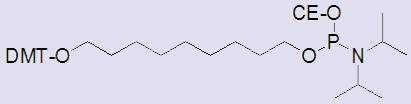
Purity: 98% +

The DMT-butanol CEP phosphoramidite (catalog #: CLP-9775) introduces the butanediol moiety (single or mutliple units) into an oligonucleotide.

The butanediol spacer has been incorporated in oligonucleotides consisting of 2',5'-A and DNA segments to produce oligonucleotide chimeras that catalyze selective cleavage of RNA in human cells *(R. K. Maitra, G. Li, W. Xiao, B. Dong, P.F. Torrence, R. H. Silverman, J. Biol. Chem.270, 15071, 1995; K. Lesiak, S. Khamnei, and P. F. Torrence, Bioconjugate Chemistry, 4, 467, 1993)*.

The corresponding CPG is also available to incorporate this unit at the 3'-end of an oligo.

DMT-Nonane-Diol Phosporamidite
(C-9 Spacer)



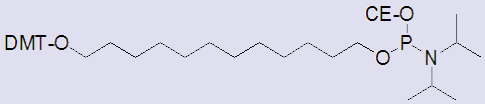
$C_{39}H_{55}N_2O_5P$
Mol. Wt.: 662.84

Catalog# CLP-9009

Pricing
$ 80.00 / 100 µmole
$150.00 / 250 mg

Purity: 98% +

DMT-Dodecane-Diol Phosphoramidite
(C-12 Spacer)



$C_{42}H_{61}N_2O_5P$
Mol. Wt.: 704.92

Catalog# CLP-1114

Pricing
$ 80.00 / 100 µmole
$150.00 / 250 mg

Purity: 98% +

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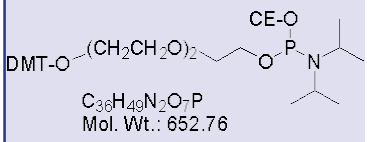
DMT-Triethyloxy-Glycol Phosphoramidite
(Spacer 9)



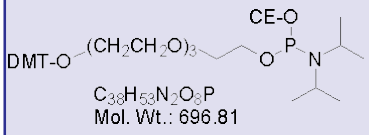
$C_{36}H_{49}N_2O_7P$
Mol. Wt.: 652.76

Catalog#
CLP-1113

Pricing
$ 80.00 / 100 µmole
$150.00 / 250 mg

Purity: 98% +

DMT-Tetraethyloxy-Glycol Phosphoramidite
(Spacer 12)



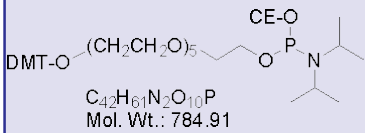
$C_{38}H_{53}N_2O_8P$
Mol. Wt.: 696.81

Catalog#
CLP-1368

Pricing
$ 80.00 / 100 µmole
$150.00 / 250 mg

Purity: 98% +

DMT-Hexa-Ethyloxy-Glycol Phosphoramidite
(Spacer 18)



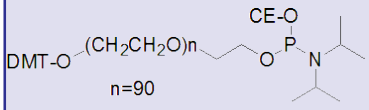
$C_{42}H_{61}N_2O_{10}P$
Mol. Wt.: 784.91

Catalog#
CLP-9765

Pricing
$ 80.00 / 250 mg
$150.00 / 500 mg

Purity: 98% +

Polyethylenglycol 4500 CEP
(Avg. M.W.~4500)



n=90

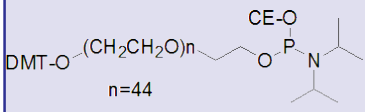
Mol. Wt. Avg: ~4500

Catalog#
CLP-3118

Pricing
$275.00 / 100 µmole
$540.00 / 1 gm

Purity: 98% +

Polyethyleneglycol 2000 CEP



n=44

$C_{120}H_{217}N_2O_{49}P$
Mol. Wt.: 2502.96

Catalog#
CLP-2119

Pricing
$115.00 / 100 µmole
$580.00 / 250 mg

Purity: 98% +

Glyceryl CPG & Butyl CPG (for 3' - Butanol Spacer)

For Glyceryl CPG and Butyl CPG please see page 81.

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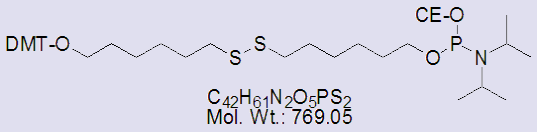
5'-Thiol C-6 Disulfide Modifier CEP



Catalog#

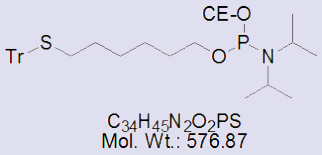
CLP-8506

Pricing

$126.00 / 100 µmole
$320.00 / 250 mg

Purity: 98% +

5'-Thiol Modifier Hexyl-6-CEP



Catalog#

CLP-5888

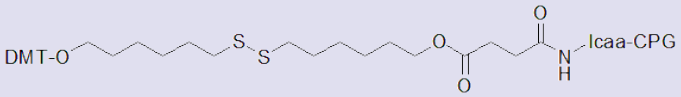
Pricing

$ 60.00 / 100 µmole
$100.00 / 100 mg
$180.00 / 250 mg

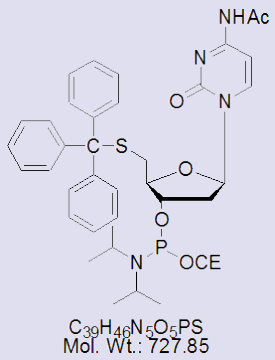
Purity: 98% +

5'-Thiol Modifier-C-6 (catalog #: CLP-5888): Several methods are available to introduce a thiol group at the 5'-end of an oligonucleotide. *(B. A. Connolly, P. Rider, Nucl. Acids Res., 12, 4485, 1985; N. D. Sinha, R. M. Cook, Nucl. Acids Res., 16, 2659, 1988; S. Sharma, K. C. Gupta, Nucl. Acids Res., 14, 4404, 1989; A. Kumar, S. Advani, H. Dawar, G. P. Talwar, Nucl. Acids Res., 19, 4561, 1991).*

DMT-C6-Disulfide Solid Support



5'-S-Trityl-2' deoxy Cytidine CEP



Catalog#

CLP-8509

Pricing

$155.00 / 100 µmole
$335.00 / 250 mg

Purity: 98% +

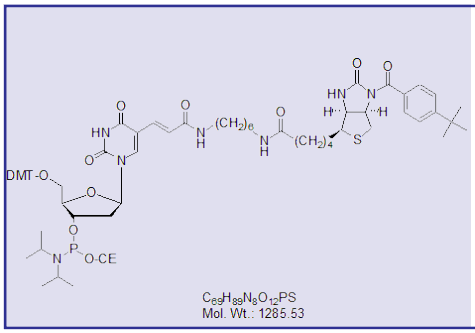
3'-Thiol Succinyl Icaa Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-9987-05	3'-Thiol Modifier	500Å	$70	$530	$68	$110	$136	$220
N-9987-10	C-6 Disulfide Icaa CPG	1000Å						

Please Indicate Synthesizer when Ordering

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

Biotin dT CEP



Catalog#

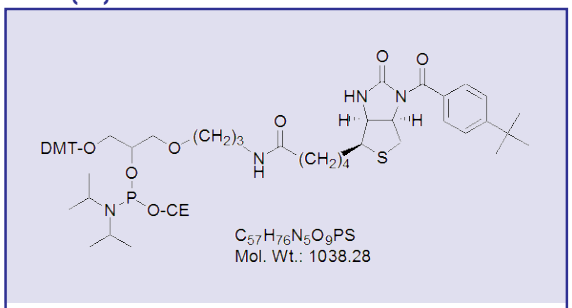
CLP-1502

Pricing

$ 80.00 / 25 µmole
$150.00 / 50 µmole
$290.00 / 100 µmole
$580.00 / 250 mg

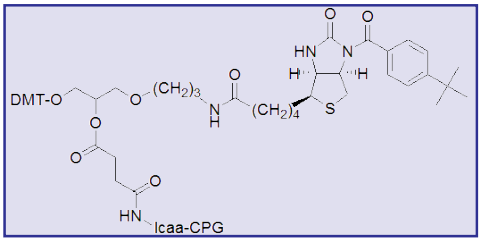
Purity: 98% +

Biotin (BB)™ CEP



Catalog#	Pricing
CLP-1517	$ 55.00 / 25 µmole
	$104.00 / 50 µmole
	$185.00 / 100 µmole
	$360.00 / 250 mg

Purity: 98% +



Biotin (BB)™ CPG

N-9162-05, N-9162-10

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-9162-05	D-(+) Biotin	500Å	$115	$970	$100	$180	$200	$360
N-9162-10	Icaa CPG	1000Å						

Biotinylation in the sequence and at the 5' Terminus

For use in automated synthesis and associated rapid purification techniques. Applications to which our biotin phosphoramidites have been applied include:

1. Diagnostic probe development including occasions where multiple biotin molecules may be introduced into a probe to enhance sensitivity of ultimate detection.
2. Introduction of biotin in the sequence and at the 5'-terminus of a primer prior to PCR amplification and trapping of the derived biotinylated DNA using streptavidin magnetic beads.
3. Introduction of biotin at the 3'-terminus of a probe capable of blocking chain extension in a PCR experiment. This is acheived through Biotin-CPG (see page 30).

Protection of the N-1 position of biotin with a lipophilic group induces higher solubility. It should be noted that we have found these products to be highly susceptible to deactivation by moisture in the diluent acetonitrile.

Biotin (BB)™ Phosphoramidites

"Biotin BB" contains a tert-butyl-benzoyl group at one of the secondary amino groups of Biotin. This novel feature is what makes ChemGenes' "Biotin BB" (catalog #: CLP-1517) superior to other commercially available biotin products, such as "Biotin dT" and "Biotin TEG". Another biotin product, "Biotin Phosphoramidite" can potentially cause side reactions during oligo synthesis due to the presence of the free urea moiety of the biotin. As repeated synthesis cycles are performed, this side reaction will occur when 3'-end attachment is desired using a solid support. The "Biotin Phosphoramidite" has an additional problem of low solubility. "MMT-Biotin Phosphoramidite", another biotin analog has a MMT-group on the urea portion of the biotin. The MMT-group, however, is potentially susceptible to hydrolysis during oligo synthesis. Furthermore, the MMT-group does not deactivate the urea moiety of biotin towards side reactions during oligo synthesis. This novel feature was originally developed by Brian Sproat and coworkers *(Uwe Pieles, Brian Sproat and Gabor M. Lamm, Nucl. Acids Res., 18,4355,1990)*. This study demonstrated that the protection of the urea nitrogen causes dramatic effect in the purity of the synthesized oligos. ChemGenes' "Biotin BB", which has a 7 atom spacer utilizes this protection feature and has tert-butyl-benzoyl protection on the urea nitrogen. This product is a simple and cost effective alternative to Biotin dT. ChemGenes also produces "Biotin BB" attached to solid support.

3'-End Labeling with Biotin BB CPG Solid Supports

"Biotin BB" CPG is used for synthesis of 3'-Biotin oligomers. The tert-butyl-benzoyl protection prevents biotin chromophore unwanted side reactions. Also available from ChemGenes are the corresponding prepacked "Biotin BB" CPG columns listed above.

Biotin BB is a trademark of ChemGenes Corporation. The starting biotin for all biotin derivatives is Biotin-D(+).

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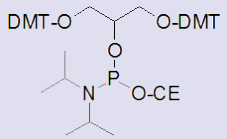
Oligo Synthesis Products

Phosphoramidites and Supports for Introducing Chromophores & Ligands

Symmetrical Branching CEP



$C_{54}H_{61}N_2O_8P$
Mol. Wt.: 897.04

Catalog#

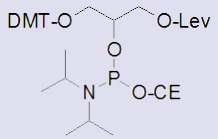
CLP-5215

Pricing

$ 90.00 / 100 µmole
$198.00 / 250 mg

Purity: 98% +

Asymmetrical Branching CEP



$C_{38}H_{49}N_2O_8P$
Mol. Wt.: 692.78

Catalog#

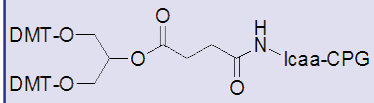
CLP-7169

Pricing

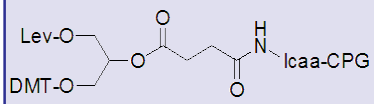
$110.00 / 100 µmole
$235.00 / 250 mg

Purity: 98% +

Symmetrical Branching Support



Asymmetrical Branching Support



Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-5216-05	Symmetrical Branching Icaa CPG	500Å	$115	$970	$110	$170	$220	$340
N-7170-05	Asymmetrical Branching Icaa CPG	500Å	$115	$970	$110	$170	$220	$340
N-7175-05	Glyceryl CPG	500Å	$115	$970	$110	$170	$220	$340
N-7178-05	Butyl CPG (for 3'-Butanol Spacer)	500Å	$115	$970	$110	$170	$220	$340

Branching phosphoramidites and solid supports:

The branching phosphoramidites incorporate branching sites into an olilgonucucleotide via automated DNA synthesis directly. Branched oligonucleotides are synthesized from the incorporated glycerol backbone, which posesses two protected hydroxyl groups for chain elongation. For example, branched oligonucleotides have been used effectively for signal amplification by introducing networks of labels or probing sites *(Horn et al., 1989; Chang et al., 1991; Foldesi et al, 1991)*.

Symmetric branching phosphoramidites:

This reagent allows simultaneous extension from the glycerol branch point because both hydroxyl groups are protected by DMT groups and are thus removed at the same time, resulting in two identical branches. Several cycles of incorporation of this amidite will result in a tree-like structure of 2 branched oligonucleotide arms. Since reporter molecules, such as biotin or flourescein, can be attached to each arm, this exponential branching can amplify and thus improve the sensitivity of these reporter molecules.

Asymmetric branching phosphoramidites:

This reagent uses DMT to protect one hydroxyl of the glyceryl backbone and a levulinyl group to protect the other. The DMT group is removed during the normal deblock step and routine chain elongation can continue from this branch. Subsequent removal of the levulinyl protecting group with hydrazine permits the elongation from the other, resulting in asymmetrical branching. The branches can differ in sequence, reporter molecules, or both.

Levulinyl Deprotection Solution

Catalog#	Pricing
CLP-7171	$22.00 / 5 ml
	$36.00 / 10 ml

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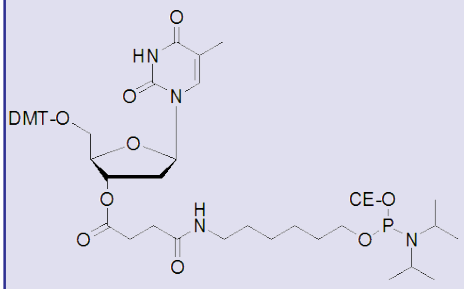
Phosphoramidites and Supports for Introducing Chromophores & Ligands

5'-Carboxyl Group Generating Reagent
(Thymidine-Succinyl Hexamide CEP)

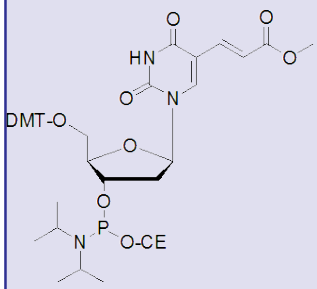


Catalog#
CLP-2244

Pricing
$25.00 / 100 µmole
$65.00 / 250 mg

Purity: 98% +

C-5 Carboxy Introducing Amidite
(Deoxy Uridine 5-Methylacrylate CEP)



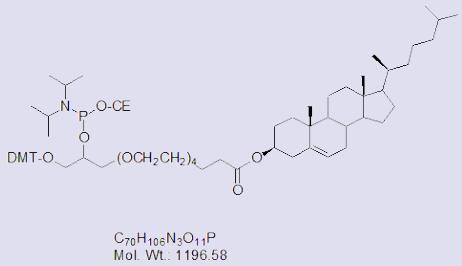
Catalog#
CLP-2842

Pricing
$150.00 / 100 µmole
$285.00 / 250 mg

Purity: 98% +

For oligos requiring a 5'-carboxylic group, this is an excellent reagent. This ligand is introduced to the oligo via attachment to a C-6 spacer at the 5'-end of the DNA or RNA oligo.

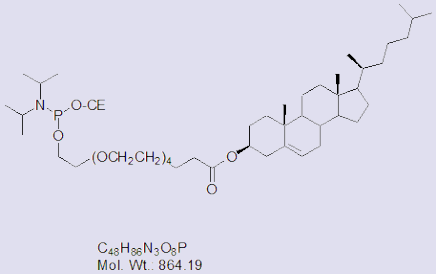
Cholesterol (TEG) CEP
(Will Generate DMT color)



Catalog#	Pricing
CLP-2703	$150.00 / 50 µmole
	$275.00 / 100 µmole
	$600.00 / 250 mg

Purity: 98% +

TEG Cholesterol (Tetra Ethylene Glycol) CEP



Catalog#	Pricing
CLP-2704	$140.00 / 50 µmole
	$265.00 / 100 µmole
	$600.00 / 250 mg

Purity: 98% +

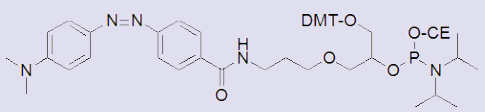
Cholesterol Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-9166-05	Cholesterol Icaa CPG	500Å	$115	$970	$110	$175	$220	$350

Cholesterol TEG phosphoramidite and solid supports:

Potential therapeutic oligonucleotides must permeate the cell membrane for optimal activity. The addition of lipophilic groups to an oligonucleotide would be expected to enhance activity. The use of cholesteryl oligos and the consequent improvement in activity has been described. Cholesterol phosphoramidite is designed with branched triethyleneglycol (TEG) spacer for maximium solubility in acetonitrile as well as for applications requiring multiple labels.

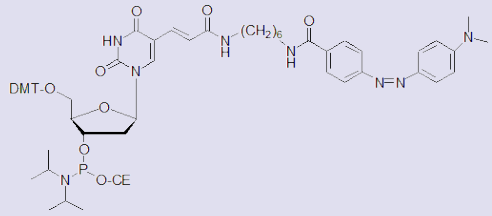
Dabcyl CEP



Catalog#	Pricing
CLP-1522	$110.00 / 50 µmole
	$175.00 / 100 µmole
	$350.00 / 250 mg

Purity: 98% +

Thymidine C-5 Dabcyl CEP



Catalog#	Pricing
CLP-9906	$150.00 / 50 µmole
	$285.00 / 100 µmole
	$500.00 / 250 mg

Purity: 98% +

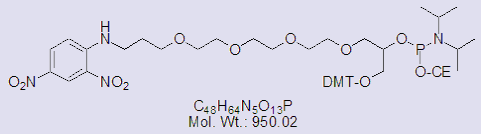
Dabcyl phosphoramidites and solid supports:

A molecular beacon probe has its natural fluorescene quenched in solution unless it is hybridized to the target sequence. Consequently, the design of a molecular beacon requires a fluorophore to be in one part of the sequence and the quencher molecule to be in another, with both molecules being separated from the oligonucleotide by a hydrocarbon spacer. The Dabcyl group has been found to be a universal quencher. Dabcyl CPGs and Dabcyl Amidites are used to prepare probes with the quencher blocking the 3'-terminus.
5'-Dabcyl Phosphoramidite locates the quencher at the 5'-terminus and Dabcyl-dT places it within the sequence, leaving the 3'-terminus available for polymerase extension.

Dabcyl Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-9756-05	Dabcyl-Icaa-CPG	500Å	$110	$940	$110	$175	$220	$350

DNP-TEG CEP



Catalog#

CLP-9907

Pricing

$145.00 / 50 µmole
$260.00 / 100 µmole
$495.00 / 250 mg

Purity: 98% +

DNP-TEG Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-9127-05	DNP-TEG-Icaa-CPG	500Å	$115	$960	$110	$185	$220	$370

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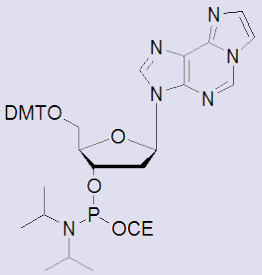
Etheno deoxy Adenosine CEP



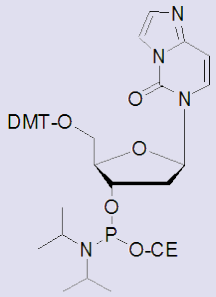
$C_{42}H_{48}N_7O_6P$
Mol. Wt.: 777.85

Catalog#
CLP-9181

Pricing
$ 95.00 / 100 µmole
$225.00 / 250 mg

Purity: 98% +

Etheno deoxy Cytidine CEP



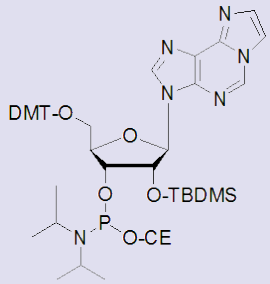
$C_{41}H_{48}N_5O_7P$
Mol. Wt.: 753.82

Catalog#
CLP-9182

Pricing
$ 95.00 / 100 µmole
$225.00 / 250 mg

Purity: 98% +

Etheno Adenosine CEP
(Etheno-2'-O-TBDMS Adenosine CEP)



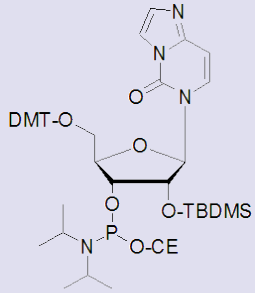
$C_{48}H_{62}N_7O_7PSi$
Mol. Wt.: 908.11

Catalog#
CLP-9191

Pricing
$190.00 / 100 µmole
$485.00 / 250 mg

Purity: 98% +

Etheno Cytidine CEP
(Etheno-2'-O-TBDMS Cytidine CEP)



$C_{47}H_{62}N_5O_8PSi$
Mol. Wt.: 884.08

Catalog#
CLP-9192

Pricing
$185.00 / 100 µmole
$465.00 / 250 mg

Purity: 98% +

Etheno Adenosine & Etheno Cytidine

Etheno-Nucleosides have high fluorescent intensity, especially etheno cytidine. They have been used for various applications such as: extremely low detection probes, selective introduction in synthetic DNA/RNA, and nucleic acid structure function & determination. Primers with etheno modification undergo PCR and are amplified. These fluorescent nucleosides are base sensitive and should be deprotected using mild conditions. (*Suresh C. Srivastava, Syed Kazim Raza, and Rakesh Misra, Nucleic Acids Research, **1994**, vol 22, no. 7, 1296-1304)*

Etheno Adenosine; Detection Limit:10^{-9}, Excitation : 260nm, Emission : 430nm
Etheno Cytidine; Detection Limit:10^{-7}

Etheno Succinyl Icaa Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-9113-05	Etheno deoxy Adenosine	500Å	$ 70	$550	$ 80	$110	$160	$240
N-9113-10	3'-Icaa CPG	1000Å						
N-9114-05	Etheno deoxy Cytidine	500Å	$ 60	$500	$ 50	$ 95	$100	$190
N-9114-10	3'-Icaa CPG	1000Å						
N-9191-05	Etheno Adenosine	500Å	$110	$910	$100	$135	$200	$270
N-9191-10	2'-TBDMS 3'-Icaa CPG	1000Å						
N-9192-05	Etheno Cytidine	500Å	$110	$910	$100	$135	$200	$270
N-9192-10	2'-TBDMS 3'-Icaa CPG	1000Å						

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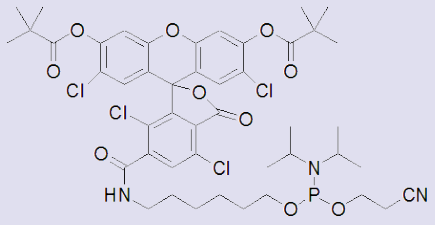
Tetrachloro Fluorescein Phosphoramidite (TET)

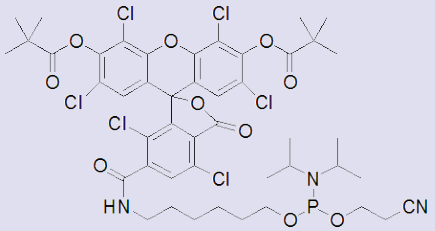


$C_{46}H_{54}Cl_4N_3O_{10}P$
Mol. Wt.: 981.72

Catalog#	Pricing
CLP-9779	$165.00 / 50 µmole
	$325.00 / 100 µmole
	$725.00 / 250 mg

Purity: 98% +

Hexachloro Fluorescein Phosphoramidite (HEX)

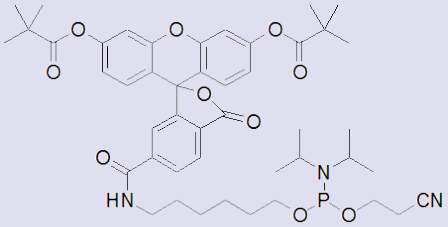


$C_{46}H_{52}Cl_6N_3O_{10}P$
Mol. Wt.: 1050.61

Catalog#	Pricing
CLP-9778	$165.00 / 50 µmole
	$325.00 / 100 µmole
	$725.00 / 250 mg

Purity: 98% +

6-FAM Phosphoramidite (5'-attachment only)



$C_{46}H_{58}N_3O_{10}P$
Mol. Wt.: 843.94

Catalog#	Pricing
CLP-9777	$165.00 / 50 µmole
	$325.00 / 100 µmole
	$725.00 / 250 mg

Purity: 98% +

TET, HEX, 6-FAM

These fluorescein derivatives have been used for non-isotopic fluorescent sequencing, hybridization, and PCR product quantitation. They either are used for antibody binding or as a fluorophore for fluorescent signal generation. Each have their own excitation and emission wavelengths: 6-FAM (ABS=492nm & EM=515nm), HEX (ABS=535nm & EM=556 nm), TET (ABS=521nm & EM=536nm). The fluorescence and absorbance of fluorescein is very pH sensitive with both being the greatest at pH 8-9.

These fluorescent labels are generally added to the 5' end. Purification of the oligo is recommended either by HPLC or PAGE.

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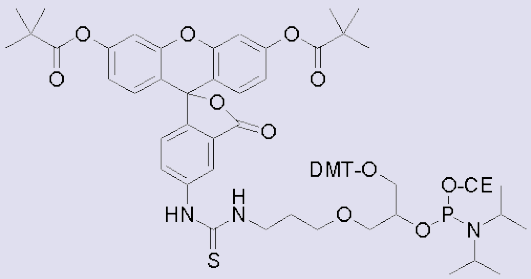
Phosphoramidites and Supports for Introducing Chromophores & Ligands

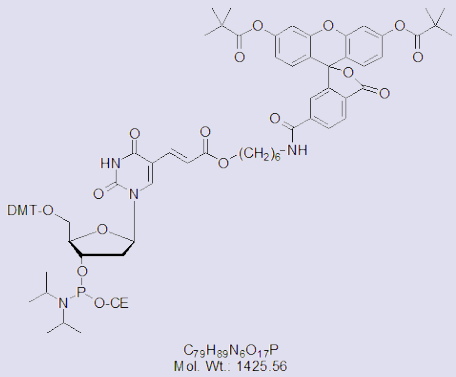
5-Fluorescein CEP



Catalog#	Pricing
CLP-4282	$155.00 / 50 µmole
	$275.00 / 100 µmole
	$550.00 / 250 mg

Purity: 98% +

Fluorescein dT CEP



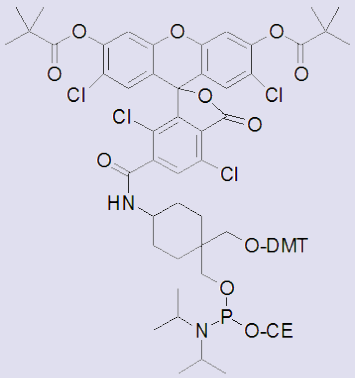
Catalog#	Pricing
CLP-9905	$180.00 / 50 µmole
	$325.00 / 100 µmole
	$680.00 / 250 mg

Purity: 98% +

Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-5122-05	Fluorescein dT	500Å	$120	$995	$120	$200	$240	$400
N-9979-05	Fluorescein	500Å	$110	$970	$110	$180	$220	$360
N-9985-05	6-FAM Glyceryl	500Å	$110	$970	$110	$180	$220	$360
N-9986-05	6-FAM Icaa CPG (DMT)	500Å	$110	$970	$110	$180	$220	$360

Tetrachloro Fluorescein Cyclohexyl CEP



Catalog#

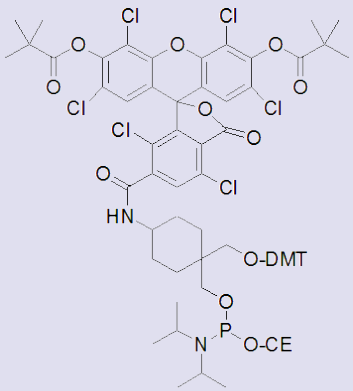
CLP-1526

Pricing

$148.00 / 50 µmole
$292.00 / 100 µmole
$785.00 / 250 mg

Purity: 98% +

Hexachloro Fluorescein Cyclohexyl CEP



Catalog#

CLP-1527

Pricing

$148.00 / 50 µmole
$292.00 / 100 µmole
$785.00 / 250 mg

Purity: 98% +

All of the above fluorescein amidites generate DMT-color after oligo coupling.

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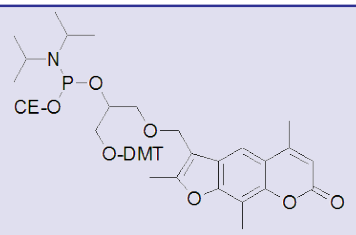
Phosphoramidites and Supports for Introducing Chromophores & Ligands

Psoralen CEP

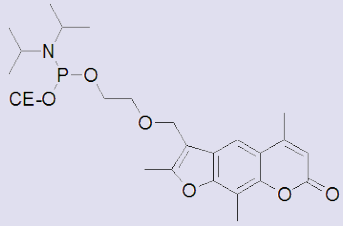


$C_{48}H_{55}N_2O_9P$
Mol. Wt.: 834.93

Catalog#	Pricing
CLP-6644	$115.00 / 50 µmole
	$185.00 / 100 µmole
	$495.00 / 250 mg

Purity: 98% +

Psoralen C-2 CEP

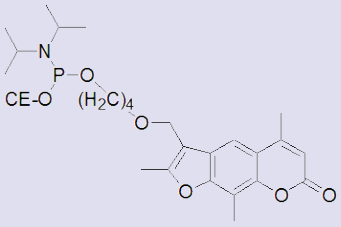


$C_{26}H_{35}N_2O_6P$
Mol. Wt.: 502.54

Catalog#	Pricing
CLP-6647	$160.00 / 100 µmole
	$470.00 / 250 mg

Purity: 98% +

Psoralen C-4 CEP

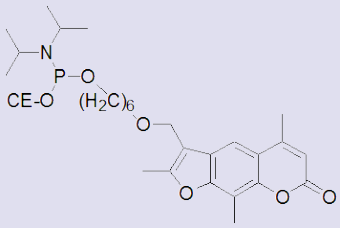


$C_{28}H_{39}N_2O_6P$
Mol. Wt.: 530.59

Catalog#	Pricing
CLP-6648	$170.00 / 100 µmole
	$475.00 / 250 mg

Purity: 98% +

Psoralen C-6 CEP



$C_{30}H_{43}N_2O_6P$
Mol. Wt.: 558.65

Catalog#	Pricing
CLP-6641	$170.00 / 100 µmole
	$475.00 / 250 mg

Purity: 98% +

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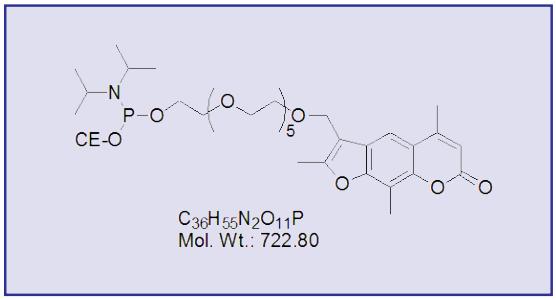
Psoralen C-18 Hexaethyloxyglycol CEP



Catalog#	Pricing
CLP-6642	$187.00 / 100 µmole
	$522.00 / 250 mg

Purity: 98% +

Psoralen Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-9375-05	Psoralen	500Å	$115	$970	$110	$170	$220	$340

Psoralens are a class of naturally occuring compounds which have been used for centuries to treat skin and tumor diseases. Psoralen binds to DNA non-specifically. Psoralen modified oligonucleotides are expected to be superior than Psoralen itself as they will hydrolize to target oligonucleotides having complementary sequences. Psoralen derived oligonucleotides have been synthesized and found to recognize complementary target DNA sequences. The double stranded DNA fragments were found to be covalently cross-linked upon irradiation at 35 nm. *(U. Pieles, U. English, Nucl. Acids Res., 17, 285, 1989; U. Pieles, B.S. Sproat, P. Neuner, F. Cramer, Nucl. Acids. Res 17, 8967 1989)*.

Psoralen attached oligonucleotides have also been hybridized with complementary target sites on RNA followed by cross-linking after photo reaction. *(J. Teare, P. Wollenzien, Nucl. Acids Res.17, 3559 1989)*. Photoinduced cross-linking has also been achieved on a double-stranded DNA by forming a triple helix. *(M. Takasugi, A. Guendouz M. Chassignol, J.L. Decont, J. Lhomme, N.T. Thuoing, C. Helene, Proc Natl. Acad. Sci USA, 88, 5602, 1991)*. Furthermore, Psoralen derived oligonucleotide methyl-phosphates have been shown to cross-link in a sequence specific manner to single-dependant antiviral activity in cultured cells infected with herpes simplex virus type-1 (HSV-1) *(M. Kulka, C. Smith, L. Aurelian, R. Fisheluich, K. Meade, P. Miller, P.O.P. Ts'O, Proc. Natl. Acad. Sci., USA, 86, 6868 (1989)*.

The psoralen support is a 16 atom spacer between Psoralen and the oligo chain (3' -end).

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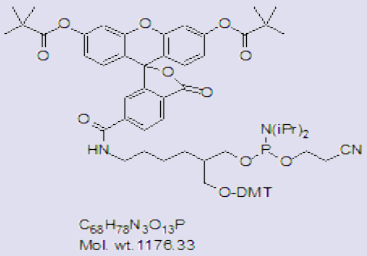
5 & 6 FAM Phosphoramidites & Supports

DMT-6-FAM Phosphoramidite



Catalog#

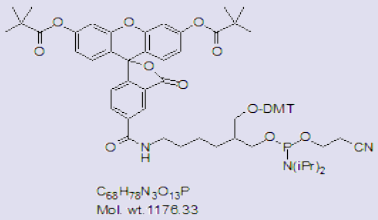
CLP-9780

Pricing

$148.00 / 50 µmole
$266.00 / 100 µmole
$534.00 / 250 mg

Purity: 98% +

DMT-5-FAM Phosphoramidite



Catalog#

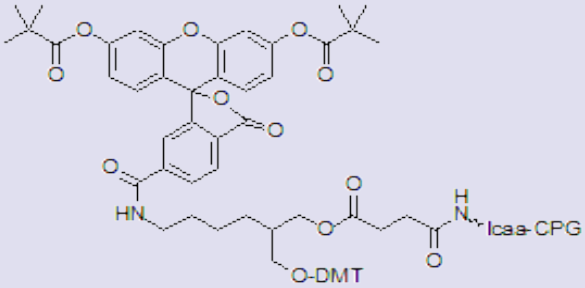
CLP-9789

Pricing

$148.00 / 50 µmole
$266.00 / 100 µmole
$534.00 / 250 mg

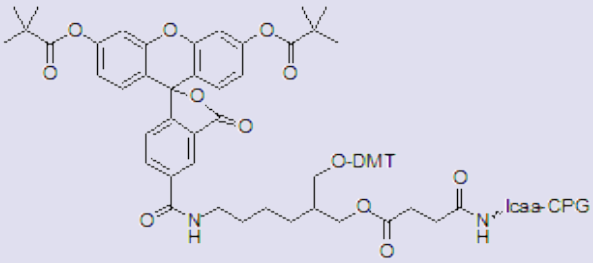
Purity: 98% +

6-FAM CPG



Catalog# N-9985-05

5-FAM CPG



Catalog# N-9969-05

5 & 6 FAM Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-9985-05	DMT-6-FAM Icaa CPG	500Å	$104	$832	$104	$168	$208	$375
N-9969-05	DMT-5-FAM Icaa CPG	500Å	$104	$832	$104	$168	$208	$375

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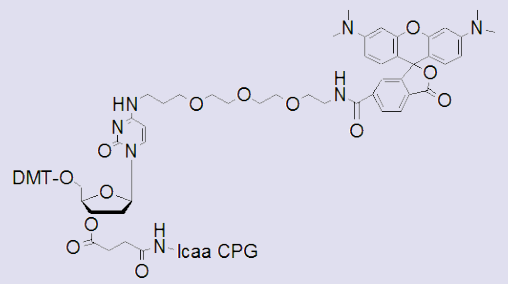
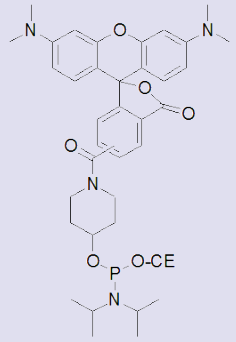
N^4-6-TAMRA Cytidine-3'- Icaa CPG



Catalog# N-2145-05

5'-TAMRA CEP



$C_{39}H_{48}N_5O_6P$
Mol. Wt.: 713.80

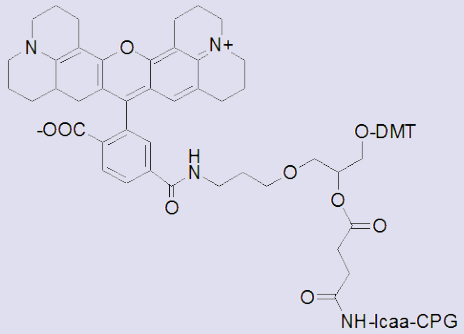
Catalog#	Pricing
CLP-9066	$185.00 / 50 µmole
	$395.00 / 100 µmole
	$765.00 / 250 mg

Purity: 98% +

Cocktail for TAMRA

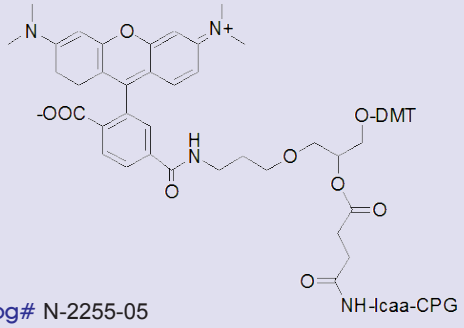
Catalog#	Pricing
RN-8561	$50.00 / 5 ml

Rox Supports & Columns



Catalog# N-2246-05

6-TAMRA Supports & Columns



Catalog# N-2255-05

TAMRA Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-2145-05	N^4 6-TAMRA Cytidine 3'-Icaa CPG	500Å	$104	$832	$104	$168	$208	$375
N-2246-05	Rox Icaa CPG	500Å	$120	$880	$120	$220	$224	$392
N-2255-05	TAMRA Icaa CPG	500Å	$104	$832	$104	$168	$208	$375

TAMRA & Rox

Like fluorescein, Tetra-methyl Rhodamine (TAMRA) conjugates are usually a mix of two isomers. ChemGenes supplies 5'-TAMRA as amidites with both two isomers having the same spectral properties. They both excite at the 540nm and emit at 570nm. They are much less pH sensitive. We offer the CPG columns for the 3'-TAMRA labeling and also TAMRA NHS Esters for labeling amino-modified oligonucleotides.
These fluorescent labels are generally added to the 5' end. Purification of the oligo is recommended either by HPLC or PAGE.

Note: Price includes Cocktail for TAMRA and Rox

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Amidites and Supports for Antisense Oligonucleotides

Antisense (i.e. sequences complimentary to the "sense" strand, or usually messenger RNA) and otherwise interfering (e.g. "decoy") oligonucleotides, oligoribonucleotides, and modified oligonucleotides have gained overhelming popularity for interference in various steps leading from DNA transcription to mRNA translation. Such regulatory interference has been harnessed for therapeutic effects against many diseases and viral infections. Production of viral proteins are inhibited by oligonucleotides that are complimentary to portions of mRNA for that protein (i.e.antisense). Other regulatory mechanisms of viruses, such as HIV, have been targeted for interference with the use of complimentary (i.e. antisense), or decoy (i.e. sense) oligonucleotides. Oligonucleotides for therapy have several advantages. These include the extremely high specificity and the ease of design based on Watson-Crick base pairing. The high association constants imply a strong duplex formation and thus effectiveness at low concentrations.

They Hybridize with Natural Targets leading to Diagnostic & Therapeutic Applications

Unmodified Oligo	2'-OMe Modified Synthetic Oligo
Poor Uptake	Lipophilic, Ampiphilic
•Molecule too big	
• Highly charged	
Nuclease Resistant	Degradation by nucleases
Greater Specificty, Reacts Rapidly	Less Specificity
Higher T_m	Lower T_m

Combination of phosphorothioate phosphodiester regenerates RNaseH activity.

Synthetic Antisense oligo (2'-OMe Modified) are designed to: Permeate cells
Bind RNA target
Inactivate target

Biological Properties of 2'-O-Methyl RNA Molecules

- 2'-O-Methyl oligonucleotides have been used as chimeric oligomers with DNA-oligomers for site directed cleavage of RNA with RNaseH (Refs 1,2).
- 2'-O-Methyl oligonucleotides are more stable against several nucleases as compared to the deoxy and ribo type of oligomers. Therefore, the 2'-O-Methyl oligonucleotides are less susceptible to several nucleases (Ref 3).
- The use of 2'-O-Methyl and mixed phosphorothioates results in an inhibitory effect against HIV induced cytopathic effects and expressions of the virus specific antigens in cultures MT-4 cells. The anti-viral activity seems to be strongly concerned with the resistance to one or the other kind of deoxynucleases (Ref 4).
- 2'-O-Methyl oligoribonucleotides form stable hetero-duplexes with the complimentary RNA. The hybrid formed has a high, or a higher T_m than the corresponding DNA sequence (Ref 1).
- 2'-O-Methyl ribonucleotides have been used as valuable antisense probes for studying pre-mRNA splicing and the structures of splicosomes (Refs 5,6).
- The 2'-O-Methylethers of common ribonucleosdes have been found as minor components of RNA (Refs 7,8).
- A number of biotechnology oriented companies in the U.S. are currently involved in the development of DNA-based diagnostic and therapeutic products, using 2'-O-Methyl oligonucleotide sequences (Ref 9), such as GEM^{R}132 being developed for HCMV treatment (Ref.10).
- Antisense oligonucleotides have inhibited several gene functions in mammalian cell lines such as myc, bcl-2 (relevant to lymphomas), and erb-B2 (relevant to breast cancer).

References

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3. Dunlap, B.F., Friderici, K.H., Rottman, F., Biochemistry 10:2581-2587 (1971)
4. Shibahara, S., Mukai, S., Morisawa, H., Nakashima, H., Kobayashi, S., Yamamoto, N., Nucl. Acids Res. 17:239-252 (1989)
5. Lamond, A.I., Sproat, B.S., Ryder, U., Hamm, J., Cell 58: 383-390 (1989)
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7. R.H. Hall, "The Modified Nucleosides in Nucleic Acids", Columbia University Press, New York, NY., (1971)
8. Cotton, M., Oberhauser, B., Schaffner, G., Wagner, E., and Birnsteil, M.L., Nucl. Acids Res., 19: 2629-2635 (1991)
9. Agarwal, S. and Tang, J.Y., Antisense Res. and Devel: 4,261 (1992
10. J. Michael Grindel, XII International Roundtable, Nucleosides, Nucleotides & Their Biological Applications, La Jolla, CA, Sep 15-19,1996, Abstract 0850

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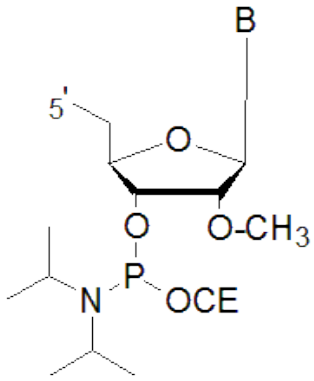

2'- O- Methyl RNA With Standard Base Protection

5'	B	Protection	Catalog#
O-DMT	A	*N*-Bz	ANP-5751
O-DMT	C	*N*-Bz	ANP-5752
O-DMT	G	*N*-iBu	ANP-5753
O-DMT	U	n/a	ANP-5754
O-DMT	C	*N*-Ac	ANP-6756
O-MMT	A	*N*-Bz	ANP-5756
O-MMT	G	*N*-iBu	ANP-5757

Catalog#	Product name	100μmole	250mg	500mg	1gm	5gm	10gm
ANP-5751	2'-O-Methyl-Adenosine (*N*-Bz) 3'-CEP, *M.W. 887.96*	$18	$45	$81	$146	$657	$1,183
ANP-5752	2'-O-Methyl-Cytidine (*N*-Bz) 3'-CEP, *M.W. 863.93*	$18	$45	$81	$146	$657	$1,183
ANP-5753	2'-O-Methyl-Guanosine (*N*-iBu) 3'-CEP, *M.W. 869.94*	$18	$45	$81	$146	$657	$1,183
ANP-5754	2'-O-Methyl-Uridine 3'-CEP, *M.W. 760.81*	$18	$45	$81	$146	$657	$1,183
ANP-6756	2'-O-Methyl-Cytidine (*N*-Ac) 3'-CEP, *M.W. 801.86*	$18	$45	$81	$146	$657	$1,183
ANP-5756	MMT-2'-O-Methyl-Adenosine (*N*-Bz) 3'-CEP, *M.W. 857.93*	$18	$45	$81	$146	$657	$1,183
ANP-5757	MMT-2'-O-Methyl-Guanosine (*N*-iBu) 3'-CEP, *M.W. 839.92*	$18	$45	$81	$146	$657	$1,183

2'-O-Methyl Amidites are covered by ChemGenes patent, U.S. Patent No. 5,525,719

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AB30	AB39	EX	MR	PX

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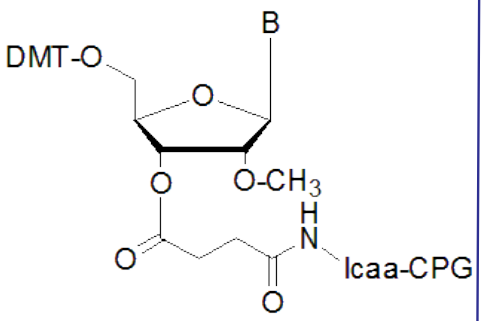
Amidites and Supports for Antisense Oligonucleotides



2'- O- Methyl RNA Supports & Columns With Standard Base Protection

5'	B	Protection	Catalog#
O-DMT	A	*N*-Bz	N-7910
O-DMT	C	*N*-Bz	N-7911
O-DMT	G	*N*-iBu	N-7912
O-DMT	U	n/a	N-7904
O-DMT	C	*N*-Ac	N-7905

			Bulk CPG			pack of 4 cols.			each		pack of 10 cols.		
Catalog #	Product Name	Pore Size	100 mg	250 mg	1 gm	40 nmole	0.2 µmole	1.0 µmole	10 µmole	15 µmole	40 nmole	0.2 µmole	1.0 µmole
N-7910-05	2'-*O*-Methyl Adenosine	500Å											
N-7910-10	(*N*-Bz) 3'-Icaa CPG	1000Å	$38	$80	$285	$50	$60	$75	$150	$225	$100	$120	$150
N-7911-05	2'-*O*-Methyl Cytidine	500Å											
N-7911-10	(*N*-Bz) 3'-Icaa CPG	1000Å	$38	$80	$285	$50	$60	$75	$150	$225	$100	$120	$150
N-7912-05	2'-*O*-Methyl Guanosine	500Å											
N-7912-10	(*N*-iBu) 3'-Icaa CPG	1000Å	$38	$80	$285	$50	$60	$75	$150	$225	$100	$120	$150
N-7904-05	2'-*O*-Methyl Uridine	500Å											
N-7904-10	3'-Icaa CPG	1000Å	$38	$80	$285	$50	$60	$75	$150	$225	$100	$120	$150
N-7905-05	2'-*O*-Methyl Cytidine	500Å											
N-7905-10	(*N*-Ac) 3'-Icaa CPG	1000Å	$38	$80	$285	$50	$60	$75	$150	$225	$100	$120	$150

Please Indicate Synthesizer when Ordering

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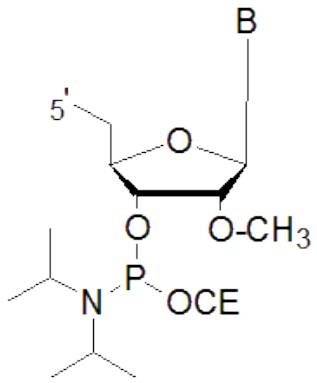
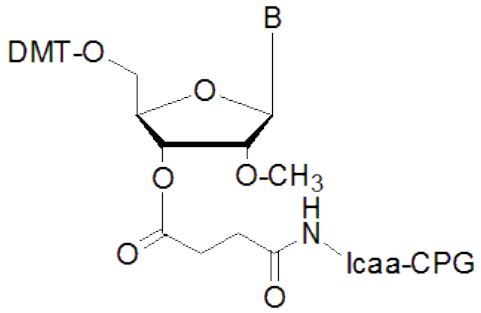


2'- O- Methyl RNA Amidites With Labile Base Protection

5'	B	Protection	Catalog#
O-DMT	A	*N*-PAC	ANP-6751
O-DMT	C	*N*-PAC	ANP-6752
O-DMT	G	*N*-PAC	ANP-6753
O-DMT	G	*N,N*-DMF	ANP-6759 NEW!
O-DMT	U	n/a	ANP-5754

Catalog#	Product name	100μmole	250mg	500mg	1gm	5gm	10gm
ANP-6751	2'-*O*-Methyl-Adenosine (*N*-PAC) 3'-CEP, *M.W. 917.18*	$22	$48	$88	$158	$710	$1,392
ANP-6752	2'-*O*-Methyl-Cytidine (*N*-PAC) 3'-CEP, *M.W. 893.96*	$22	$48	$88	$158	$710	$1,392
ANP-6753	2'-*O*-Methyl-Guanosine (*N*-PAC) 3'-CEP, *M.W. 933.98*	$22	$48	$88	$158	$710	$1,392
ANP-6759 NEW!	2'-*O*-Methyl-Guanosine (*N,N*-DMF) 3'-CEP, *M.W. 854.93*	$22	$48	$88	$158	$710	$1,392
ANP-5754	2'-*O*-Methyl-Uridine 3'-CEP, *M.W. 760.81*	$22	$48	$88	$158	$710	$1,392



Solid Support -2'- O- Methyl RNA with Labile Base Protection

5'	B	Protection	Catalog#
O-DMT	A	*N*-PAC	N-P7901
O-DMT	C	*N*-PAC	N-P7902
O-DMT	G	*N*-PAC	N-P7903

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	pack of 4 cols. 40 nmole	pack of 4 cols. 0.2 μmole	pack of 4 cols. 1.0 μmole	pack of 10 cols. 40 nmole	pack of 10 cols. 0.2 μmole	pack of 10 cols. 1.0 μmole
N-P7901-05	2'-*O*-Methyl Adenosine	500Å								
N-P7901-10	(*N*-PAC) 3'-Icaa CPG	1000Å	$86	$290	$50	$60	$75	$100	$120	$150
N-P7902-05	2'-*O*-Methyl Cytidine	500Å								
N-P7902-10	(*N*-PAC) 3'-Icaa CPG	1000Å	$86	$290	$50	$60	$75	$100	$120	$150
N-P7903-05	2'-*O*-Methyl Guanosine	500Å								
N-P7903-10	(*N*-PAC) 3'-Icaa CPG	1000Å	$86	$290	$50	$60	$75	$100	$120	$150

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AB30	AB39	EX	MR	PX

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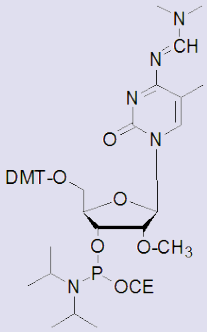
5-Methyl Cytidine 2'-O-Methyl CEP

(5-Methyl Cytidine 2'-O-Methyl (*N,N*-DMF) CEP)



$C_{44}H_{57}N_6O_8P$
Mol. Wt.: 828.93

Catalog#

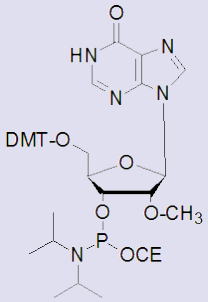
ANP-6554

Pricing

$140.00 / 100 µmole
$350.00 / 250 mg

Purity: 98% +

2'-O-Methyl Inosine CEP



$C_{41}H_{49}N_6O_8P$
Mol. Wt.: 784.84

Catalog#

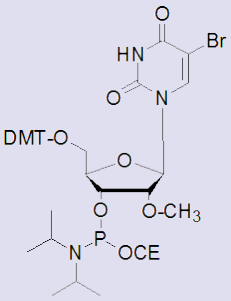
ANP-5758

Pricing

$120.00 / 100 µmole
$300.00 / 250 mg

Purity: 98% +

5-Bromo Uridine 2'-O-Methyl CEP



$C_{40}H_{48}BrN_4O_9P$
Mol. Wt.: 839.71

Catalog#

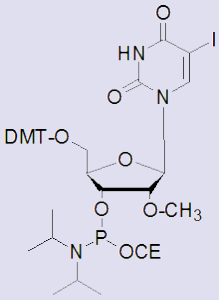
ANP-5760

Pricing

$140.00 / 100 µmole
$320.00 / 250 mg

Purity: 98% +

5-Iodo Uridine 2'-O-Methyl CEP



$C_{40}H_{48}IN_4O_9P$
Mol. Wt.: 886.71

Catalog#

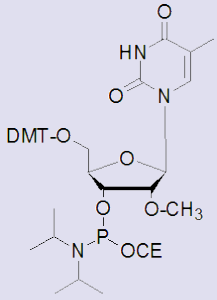
ANP-5759

Pricing

$140.00 / 100 µmole
$320.00 / 250 mg

Purity: 98% +

2'-O-Methyl 5-Methyl Uridine (Ribo Thymidine) CEP



$C_{41}H_{51}N_4O_9P$
Mol. Wt.: 774.84

Catalog#

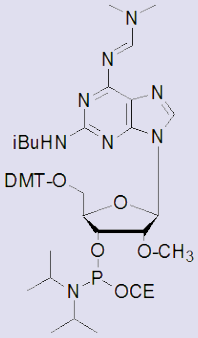
ANP-5600

Pricing

$120.00 / 100 µmole
$300.00 / 250 mg

Purity: 98% +

2,6-Diamino Purine-2'-O-Methyl CEP



$C_{48}H_{62}N_9O_8P$
Mol. Wt.: 924.04

Catalog#

ANP-8618

Pricing

$285.00 / 100 µmole
$740.00 / 250 mg

Purity: 98% +

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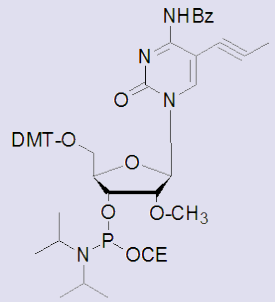
5-Propynyl-2'-O-Methyl Cytidine CEP

(5-Propynyl-2'-O-Methyl Cytidine (*N*-Bz) CEP)



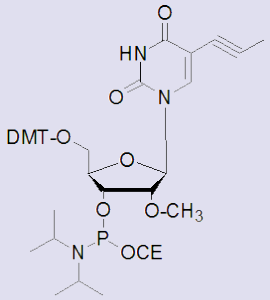
$C_{50}H_{56}N_5O_9P$
Mol. Wt.: 901.98

Catalog#
ANP-1874

Pricing
$242.00 / 100 µmole
$620.00 / 250 mg

Purity: 98% +

5-Propynyl-2'-O-Methyl Uridine CEP



$C_{43}H_{51}N_4O_9P$
Mol. Wt.: 798.86

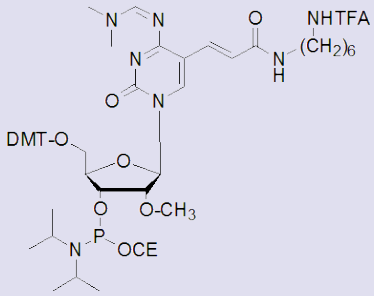
Catalog#
ANP-1347

Pricing
$220.00 / 100 µmole
$580.00 / 250 mg

Purity: 98% +

Amino Modifier Cytidine CEP

(Amino Modifier 2'-O-Methyl Cytidine (*N,N*-DMF) CEP)



$C_{48}H_{58}F_3N_8O_{10}P$
Mol. Wt.: 994.99

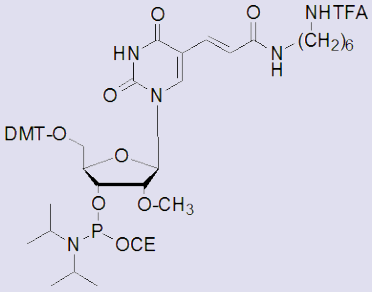
Catalog#
ANP-2583

Pricing
$270.00 / 100 µmole
$540.00 / 250 mg

Purity: 98% +

Amino Modifier Uridine CEP

(Amino Modifier 2'-O-Methyl Uridine (C-6) CEP)



$C_{45}H_{52}F_3N_6O_{11}P$
Mol. Wt.: 940.90

Catalog#
ANP-2581

Pricing
$225.00 / 100 µmole
$450.00 / 250 mg

Purity: 98% +

Modified 2'-O-Methyl 3'-Succinyl Icaa Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG 250 mg	Bulk CPG 1 gm	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-1613-05 N-1613-10	5-Methyl Cytidine (*N,N*-DMF) 2'-*O*-Methyl-3'-Icaa CPG	500Å 1000Å	$230	$900	$125	$200	$250	$400
N-9013-05 N-9013-10	Inosine 2'-*O*-Methyl 3'-Icaa CPG	500Å 1000Å	$230	$900	$125	$200	$250	$400
N-9011-05 N-9011-10	5-Bromo Uridine 2'-*O*-Methyl-3'-Icaa CPG	500Å 1000Å	$230	$900	$125	$200	$250	$400
N-9012-05 N-9012-10	5-Iodo Uridine 2'-*O*-Methyl-3'-Icaa CPG	500Å 1000Å	$230	$900	$125	$200	$250	$400
N-5601-05 N-5601-10	Ribo Thymidine 2'-*O*-Methyl-3'-Icaa CPG	500Å 1000Å	$190	$750	$100	$175	$200	$350

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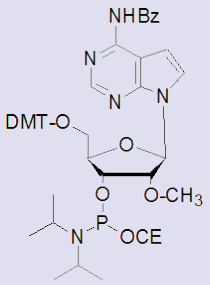
7-deaza-2'-O-Methyl Adenosine CEP

(7-deaza-2'-O-Methyl Adenosine (*N*-Bz) CEP)



$C_{49}H_{55}N_6O_8P$
Mol. Wt.: 886.97

Catalog#

ANP-5951

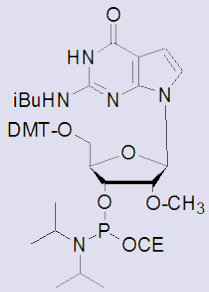
Pricing

$264.00 / 50 µmole
$462.00 / 100 µmole

Purity: 98% +

7-deaza-2'-O-Methyl Guanosine CEP

(7-deaza-2'-O-Methyl Guanosine (*N*-iBu) CEP)



$C_{46}H_{57}N_6O_9P$
Mol. Wt.: 868.95

Catalog#

ANP-5953

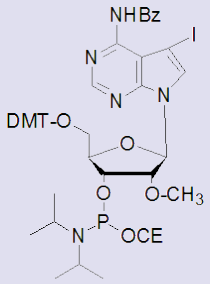
Pricing

$279.00 / 50 µmole
$495.00 / 100 µmole

Purity: 98% +

7-Iodo-7-deaza-2'-O-Methyl Adenosine CEP

(7-iodo-7-deaza-2'-O-Methyl Adenosine (*N*-Bz) CEP)



$C_{49}H_{54}IN_6O_8P$
Mol. Wt.: 1012.87

Catalog#

ANP-9171

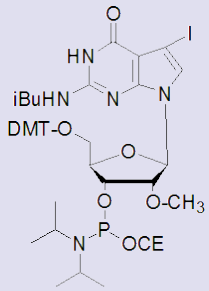
Pricing

$286.00 / 50 µmole
$495.00 / 100 µmole

Purity: 98% +

7-Iodo-7-deaza-2'-O-Methyl Guanosine CEP

(7-iodo-7-deaza-2'-O-Methyl Guanosine (*N*-iBu) CEP)



$C_{46}H_{56}IN_6O_9P$
Mol. Wt.: 994.85

Catalog#

ANP-9173

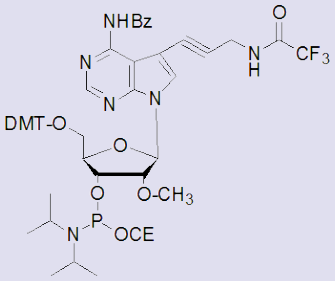
Pricing

$286.00 / 50 µmole
$495.00 / 100 µmole

Purity: 98% +

7-deaza 7-Propargyl 2'-O-Methyl Adenosine CEP

(7-deaza 7-Propargyl Amino TFA 2'-O-Methyl Adenosine (*N*-Bz) CEP)



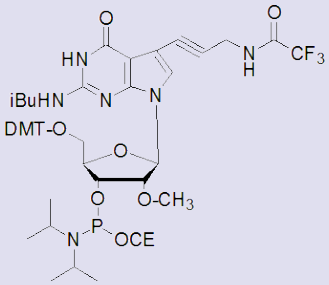
$C_{54}H_{57}F_3N_7O_9P$
Mol. Wt.: 1036.04

Catalog#	Pricing
ANP-9176	$315.00 / 50 µmole
	$534.00 / 100 µmole

Purity: 98% +

7-deaza 7-Propargyl 2'-O-Methyl Guanosine CEP

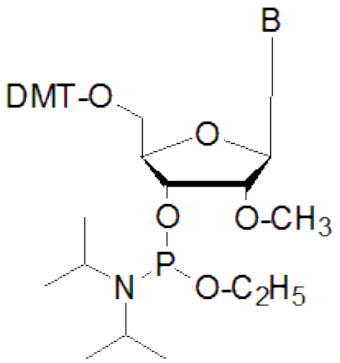
(7-deaza 7-Propargyl Amino TFA 2'-O-Methyl Guanosine (*N*-iBu) CEP)



$C_{51}H_{59}F_3N_7O_{10}P$
Mol. Wt.: 1018.02

Catalog#	Pricing
ANP-9178	$315.00 / 50 µmole
	$534.00 / 100 µmole

Purity: 98% +



P-Ethoxy 2'-O-Methyl DNA Amidites with Standard Base Protection

5'	B	Protection	Catalog #
O-DMT	A	*N*-Bz	ANP-7221
O-DMT	C	*N*-Bz	ANP-7222
O-DMT	G	*N*-iBu	ANP-7223
O-DMT	T	n/a	ANP-7224
O-DMT	U	n/a	ANP-7225

Catalog #	Product Name	250mg	500mg	1gm
ANP-7221	2'-*O*-Methyl Adenosine (*N*-Bz) *P*-Ethoxy phosphoramidite, *M.W. 826.93*	$55	$90	$146
ANP-7222	2'-*O*-Methyl Cytidine (*N*-Bz) *P*-Ethoxy phosphoramidite, *M.W. 838.90*	$55	$90	$146
ANP-7223	2'-*O*-Methyl Guanosine (*N*-iBu) *P*-Ethoxy phosphoramidite, *M.W. 844.92*	$55	$90	$146
ANP-7224	2'-*O*-Methyl Thymidine *P*-Ethoxy phosphoramidite, *M.W. 735.78*	$55	$90	$146
ANP-7225	2'-*O*-Methyl Uridine *P*-Ethoxy phosphoramidite, *M.W. 721.77*	$55	$90	$146

Applications:

For the synthesis of DNA/RNA with neutral charge instead of a negatively charged phosphate back bone, p-ethoxys not only provide neutral charge but impart lipophilic character to the synthetic DNA. It is a useful product for the development of delivery of DNA molecules into cells. With the already established usefulness of 2'-O-Methyl RNA, additional backbone modification to the phosphate neutral charge would provide valuable products in the field of antisense therapeutics.

The above products are covered under ChemGenes patent #6,015,886.

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AB30	AB39	BK	EX	MR	PX

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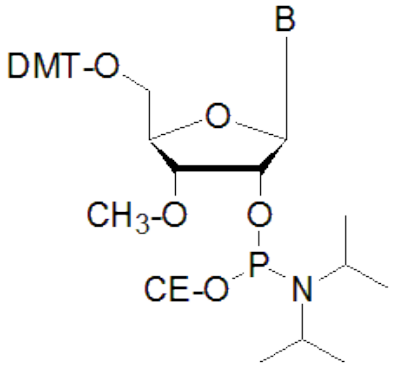
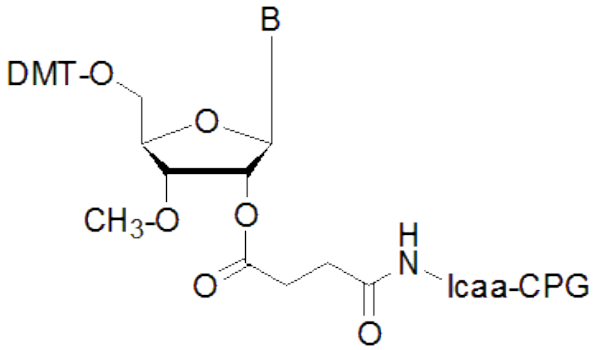
Amidites and Supports for Antisense Oligonucleotides



3'-O-Methyl Amidites with Standard Base Protection

5'	B	Protection	Catalog#
O-DMT	A	*N*-Bz	ANP-2901
O-DMT	C	*N*-Bz	ANP-2902
O-DMT	G	*N*-iBu	ANP-2903
O-DMT	U	n/a	ANP-2904
O-DMT	Inosine	n/a	ANP-2905

Catalog #	Product Name	250mg	500mg	1gm
ANP-2901	3'-*O*-Methyl Adenosine (*N*-Bz) 2'-CEP, *M.W. 887.96*	$165	$294	$530
ANP-2902	3'-*O*-Methyl Cytidine (*N*-Bz) 2'-CEP, *M.W. 863.93*	$165	$294	$530
ANP-2903	3'-*O*-Methyl Guanosine (*N*-iBu) 2'-CEP, *M.W. 869.94*	$165	$294	$530
ANP-2904	3'-*O*-Methyl Uridine 2'-CEP, *M.W. 760.81*	$165	$294	$530
ANP-2905	3'-*O*-Methyl Inosine 2'-CEP, *M.W. 784.84*	$165	$294	$530



3'-O-Methyl Suports with Standard Base Protection

5'	B	Protection	Catalog #
O-DMT	A	*N*-Bz	N-8810
O-DMT	C	*N*-Bz	N-8811
O-DMT	G	*N*-iBu	N-8812
O-DMT	U	n/a	N-8813
O-DMT	Inosine	n/a	N-8814

Catalog #	Product Name	Pore Size	Bulk CPG 250 mg	Bulk CPG 1 gm	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-8810-05 N-8810-10	3'-O-Methyl Adenosine (*N*-Bz) 2'-Icaa CPG	500Å 1000Å	$125	$480	$ 95	$120	$190	$240
N-8811-05 N-8811-10	3'-O-Methyl Cytidine (*N*-Bz) 2'-Icaa CPG	500Å 1000Å	$125	$480	$ 95	$120	$190	$240
N-8812-05 N-8812-10	3'-O-Methyl Guanosine (*N*-iBu) 2'-Icaa CPG	500Å 1000Å	$125	$480	$ 95	$120	$190	$240
N-8813-05 N-8813-10	3'-O-Methyl Uridine 2'-Icaa CPG	500Å 1000Å	$125	$480	$ 95	$120	$190	$240
N-8814-05 N-8814-10	3'-O-Methyl Inosine 2'-Icaa CPG	500Å 1000Å	$250	$900	$135	$245	$270	$490

The above products are covered under ChemGenes patent #5,525,719.

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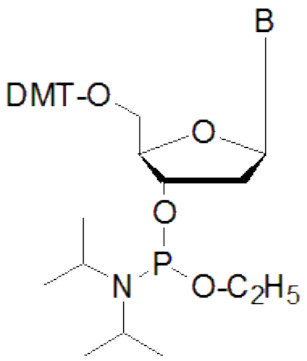
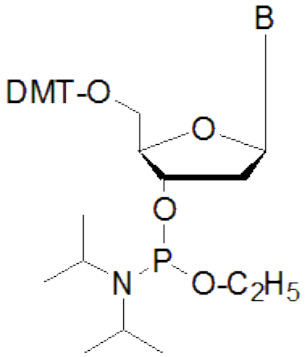


P-Ethoxy DNA Amidites with Standard Base Protection

5'	B	Protection	Catalog#
O-DMT	A	*N*-Bz	ANP-6541
O-DMT	C	*N*-Bz	ANP-6542
O-DMT	G	*N*-iBu	ANP-6543
O-DMT	T	n/a	ANP-6544

Catalog #	Product Name	500mg	1gm
ANP-6541	deoxy Adenosine (*N*-Bz) 3'-*P*-Ethoxy phosphoramidite, *M.W. 832.92*	$45	$80
ANP-6542	deoxy Cytidine (*N*-Bz) 3'-*P*-Ethoxy phosphoramidite, *M.W. 808.90*	$45	$80
ANP-6543	deoxy Guanosine (*N*-iBu) 3'-*P*-Ethoxy phosphoramidite, *M.W. 814.91*	$45	$80
ANP-6544	Thymidine 3'-*P*-Ethoxy phosphoramidite, *M.W. 719.80*	$45	$80



P-Ethoxy DNA Amidites with Labile Base Protection

5'	B	Protection	Catalog #
O-DMT	A	*N*-PAC	ANP-5541
O-DMT	C	*N*-PAC	ANP-5542
O-DMT	G	*N*-PAC	ANP-5543
O-DMT	T	n/a	ANP-6544

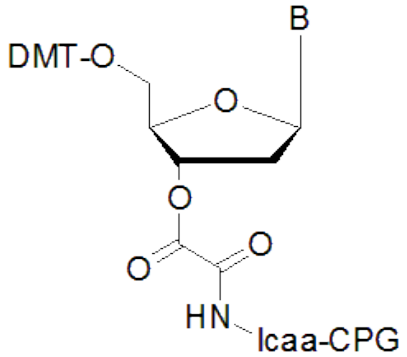
Catalog #	Product Name	250mg	500mg	1gm
ANP-5541	deoxy Adenosine (*N*-PAC) 3'-*P*-Ethoxy phosphoramidite, *M.W. 862.95*	$27	$48	$90
ANP-5542	deoxy Cytidine (*N*-PAC) 3'-*P*-Ethoxy phosphoramidite, *M.W. 838.92*	$27	$48	$90
ANP-5543	deoxy Guanosine (*N*-PAC) 3'-*P*-Ethoxy phosphoramidite, *M.W. 935.05*	$27	$48	$90
ANP-6544	Thymidine 3'-*P*-Ethoxy phosphoramidite, *M.W. 719.80*	$27	$45	$80

Applications:

For the synthesis of DNA/RNA with neutral charge instead of a negatively charged phosphate backbone, p-ethoxy not only provide neutral charge but impart lipophilic character to the synthetic DNA. It is a useful product for the development of delivery of DNA molecules into cells. For clean removal of the base protecting groups using ammonia free deprotection solution, see the following page.

Oligo Synthesis Products

Amidites and Supports for Antisense Oligonucleotides



Oxalyl Supports with with Labile Base Protection for DNA Synthesis

5'	B	Protection	Catalog #
O-DMT	A	*N*-PAC	N-5131
O-DMT	C	*N*-PAC	N-5132
O-DMT	G	*N*-PAC	N-5133
O-DMT	T	n/a	N-5134

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	Bulk CPG 1 gm	pack of 4 cols. 40 µmole	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 40 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-5131-05	deoxy Adenosine (*N*-PAC) 3'-oxalyl Icaa CPG	500Å	$18	$144	$32	$39	$58	$64	$78	$116
N-5132-05	deoxy Cytidine (*N*-PAC) 3'-oxalyl Icaa CPG	500Å	$18	$144	$32	$39	$58	$64	$78	$116
N-5133-05	deoxy Guanosine (*N*-PAC) 3'-oxalyl Icaa CPG	500Å	$18	$144	$32	$39	$58	$64	$78	$116
N-5134-05	Thymidine 3'-oxalyl Icaa CPG	500Å	$18	$144	$32	$39	$58	$64	$78	$116

Ammonia Free Oligo Deprotection Solution can be used with either of the following CPGs:

1. PAC-Protected nucleosides phosphoramidites must be used for efficient base deprotection using ammonia free oligo deprotection solution.

2. Oxalyl CPGs must be used for ammonia free oligo deprotection solution to cleave the oligo from the support. The standard succinyl CPGs will not get adequately deprotected when using ammonia free oligo deprotection solution. The CPG (1 µmole scale synthesis) after oligo synthesis, ether washing and followed by air drying is placed in a vial with a septum cap. The 1 ml of the ammonia free oligo deprotection solution is added using a syringe.

Ammonia Free Oligo Deprotection Solution

Catalog#	Pricing
RN-1435	$35.00 / 25 ml

Please Indicate Synthesizer when Ordering

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

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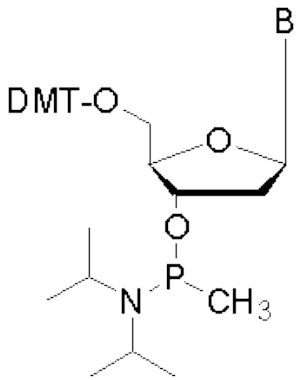


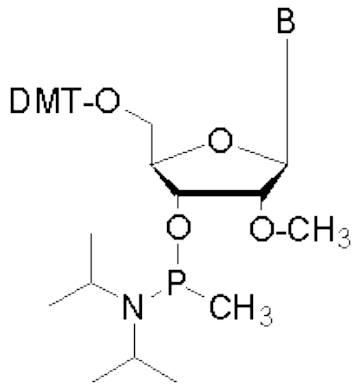
P-Methyl Phosphonamidites with Standard Base Protection

5'	B	Protection	Catalog#
O-DMT	A	*N*-Bz	ANP-7551
O-DMT	C	*N*-iBu	ANP-7556
O-DMT	G	*N*-iBu	ANP-7553
O-DMT	T	n/a	ANP-7554
O-DMT	U	n/a	ANP-7557
O-DMT	Inosine	n/a	ANP-7558

Catalog #	Product Name	250mg	500mg
ANP-7551	deoxy Adenosine (*N*-Bz) 3'-*P*-Methyl phosphonamidite, *M.W. 802.90*	$50	$90
ANP-7556	deoxy Cytidine (*N*-iBu) 3'-*P*-Methyl phosphonamidite, *M.W. 744.86*	$50	$90
ANP-7553	deoxy Guanosine (*N*-iBu) 3'-*P*-Methyl phosphonamidite, *M.W. 784.88*	$50	$90
ANP-7554	Thymidine 3'-*P*-Methyl phosphonamidite, *M.W. 689.78*	$50	$90
ANP-7557	deoxy Uridine 3'-*P*-Methyl phosphonamidite, *M.W. 675.75*	$50	$90
ANP-7558	deoxy Inosine 3'-*P*-Methyl phosphonamidite, *M.W. 699.78*	$50	$90

Please Indicate Synthesizer when Ordering

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX



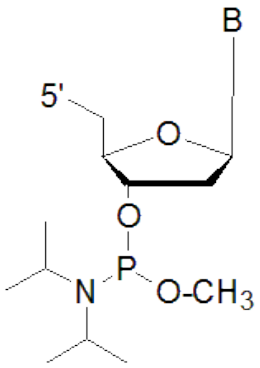
P-Methyl-2'-O-Methyl Phosphonamidites with Standard Base Protection

5'	B	Protection	Catalog#
O-DMT	A	*N*-Bz	ANP-8551
O-DMT	C	*N*-Bz	ANP-8552
O-DMT	G	*N*-iBu	ANP-8553
O-DMT	U	n/a	ANP-8554
O-DMT	C	*N*-Ac	ANP-8556

Catalog #	Product Name	100μmole	250mg
ANP-8551	2'-*O*-Methyl Adenosine (*N*-Bz) 3'-*P*-Methyl phosphonamidite, *M.W. 832.92*	$65	$182
ANP-8552	2'-*O*-Methyl Cytidine (*N*-iBu) 3'-*P*-Methyl phosphonamidite, *M.W. 774.88*	$65	$182
ANP-8553	2'-*O*-Methyl Guanosine (*N*-iBu) 3'-*P*-Methyl phosphonamidite, *M.W. 814.91*	$65	$182
ANP-8554	2'-*O*-Methyl Uridine 3'-*P*-Methyl phosphonamidite, *M.W. 705.78*	$65	$182
ANP-8556	2'-*O*-Methyl Cytidine (N-Ac) 3'-*P*-Methyl phosphonamidite, *M.W. 746.83*	$65	$182

Please Indicate Synthesizer when Ordering

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX



P-Methoxy DNA **Amidites with Labile Base Protection

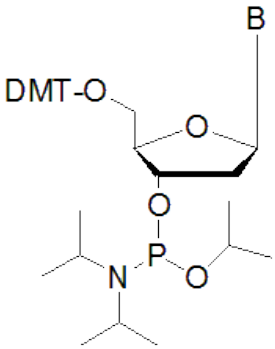
5'	B	Protection	Catalog#
O-DMT	A	*N*-PAC	ANP-5531
O-DMT	C	*N*-PAC	ANP-5532
O-DMT	G	n-tBPAC	ANP-5533
O-MMT	A	*N*-PAC	ANP-5536
O-MMT	G	n-tBPAC	ANP-5537

Catalog #	Product Name	250mg	500mg	1gm
ANP-5531	deoxy Adenosine (*N*-PAC) *P*-Methoxy phosphoramidite, *M.W.848.92*	$27	$48	$90
ANP-5532	deoxy Cytidine (*N*-PAC) *P*-Methoxy phosphoramidite, *M.W. 824.90*	$27	$48	$90
ANP-5533	deoxy Guanosine (*N*-tBPAC) *P*-Methoxy phosphoramidite, *M.W. 921.03*	$27	$48	$90
ANP-5536	MMT-deoxy Adenosine (*N*-PAC) *P*-Methoxy phosphoramidite, *M.W. 818.90*	$27	$48	$90
ANP-5537	MMT-deoxy Guanosine (*N*-tBPAC) *P*-Methoxy phosphoramidite, *M.W. 891.00*	$27	$48	$90

**With proper care, using base labile protecting groups and Ammonia free deprotection solution, it is possible to synthesize p-Methoxy tri-Ester oligonucleotides.

For Ammonia Free Oligo Deprotection Solution (Catalog #RN-1435) that can be used with p-methoxy PAC protected amidites, please see page 104.

For a discription of the advantages of using 5'-MMT nucleoside phosphoramidites, please see page #2.

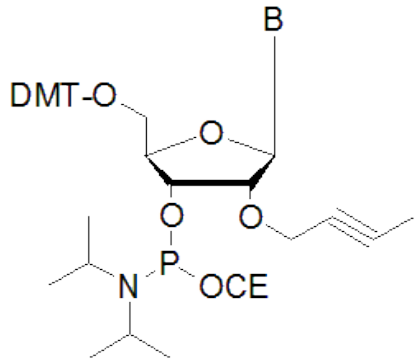


P-isopropoxy DNA ***Amidites with Labile Base Protection

5'	B	Protection	Catalog #
O-DMT	A	*N*-Bz	ANP-6901
O-DMT	C	*N*-Bz	ANP-6902
O-DMT	G	*N*-iBu	ANP-6903
O-DMT	T	n/a	ANP-6904

Catalog #	Product Name	250mg	500mg	1gm
ANP-6901	deoxy Adenosine (*N*-Bz) 3'-*P*-isopropoxy phosphoramidite, *M.W. 846.95*	$23	$44	$81
ANP-6902	deoxy Cytidine (*N*-Bz) 3'-*P*-isopropoxy phosphoramidite, *M.W. 822.92*	$23	$44	$81
ANP-6903	deoxy Guanosine (*N*-iBu) 3'-*P*-isopropoxy phosphoramidite, *M.W. 828.93*	$23	$44	$81
ANP-6904	Thymidine 3'-*P*-isopropoxy phosphoramidite, *M.W. 733.83*	$23	$44	$81

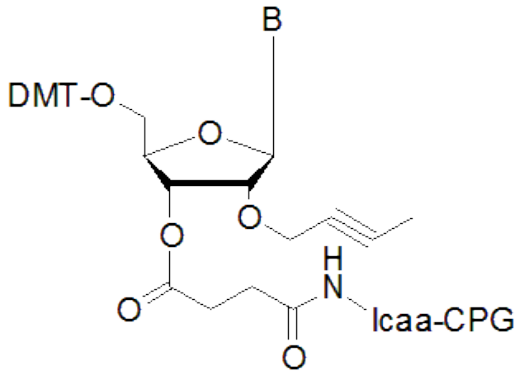
*** With proper care, using base labile protecting groups and Ammonia free deprotection solution, it is possible to synthesize *P*-isopropoxy tri-Ester oligonucleotides conveniently.



2'-O-Butyne Amidites with Standard Base Protection

5'-	B	Protection	Catalog#
O-DMT	A	*N*-Bz	ANP-7621
O-DMT	C	*N*-Bz	ANP-7622
O-DMT	G	*N*-iBu	ANP-7623
O-DMT	U	n/a	ANP-7625

Catalog #	Product Name	100μmole	250mg
ANP-7621	2'-*O*-Butyne Adenosine (*N*-Bz) 3'-CEP, *M.W. 926.01*	$185	$360
ANP-7622	2'-*O*-Butyne Cytidine (*N*-Bz) 3'-CEP, *M.W. 901.98*	$185	$360
ANP-7623	2'-*O*-Butyne Guanosine (*N*-iBu) 3'-CEP, *M.W. 907.99*	$185	$360
ANP-7625	2'-*O*-Butyne Uridine 3'-CEP, *M.W. 798.86*	$185	$360



2'-O-Butyne Supports with Standard Base Protection

5'	B	Protection	Catalog #
O-DMT	A	*N*-Bz	N-9611
O-DMT	C	*N*-Bz	N-9612
O-DMT	G	*N*-iBu	N-9613
O-DMT	U	n/a	N-9614

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	pack of 4 cols. 0.2 μmole	pack of 4 cols. 1.0 μmole	pack of 10 cols. 0.2 μmole	pack of 10 cols. 1.0 μmole
N-9611-05 N-9611-10	2'-*O*-Butyne Adenosine (*N*-Bz) 3'-Icaa CPG	500Å 1000Å	$65	$80	$95	$160	$190
N-9612-05 N-9612-10	2'-*O*-Butyne Cytidine (*N*-Bz) 3'-Icaa CPG	500Å 1000Å	$65	$80	$95	$160	$190
N-9613-05 N-9613-10	2'-*O*-Butyne Guanosine (*N*-iBu) 3'-Icaa CPG	500Å 1000Å	$65	$80	$95	$160	$190
N-9614-05 N-9614-10	2'-*O*-Butyne Uridine 3'-Icaa CPG	500Å 1000Å	$65	$80	$95	$160	$190

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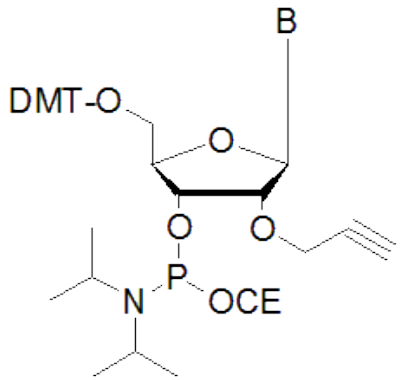
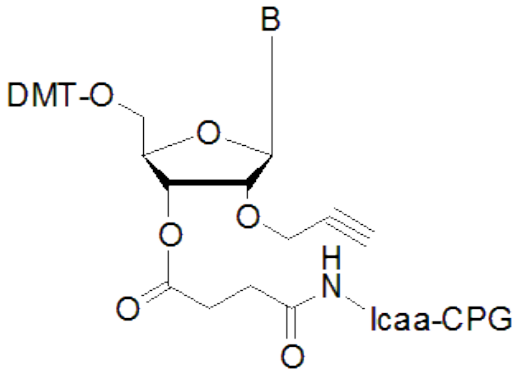
ChemGenes Exhibit 2013 - Page 111



2'-O-Propargyl Amidites with Standard Base Protection

5'	B	Protection	Catalog#
O-DMT	A	*N*-Bz	ANP-7751
O-DMT	C	*N*-Bz	ANP-7752
O-DMT	G	*N*-iBu	ANP-7753
O-DMT	U	n/a	ANP-7754

Catalog #	Product Name	100µmole	250mg
ANP-7751	2'-*O*-Propargyl Adenosine (*N*-Bz) 3'-CEP, *M.W. 911.98*	$185	$360
ANP-7752	2'-*O*-Propargyl Cytidine (*N*-Bz) 3'-CEP, *M.W. 887.96*	$185	$360
ANP-7753	2'-*O*-Propargyl Guanosine (*N*-iBu) 3'-CEP, *M.W. 893.96*	$185	$360
ANP-7754	2'-*O*-Propargyl Uridine 3'-CEP, *M.W. 784.83*	$185	$360



2'-O-Propargyl Supports with Standard Base Protection

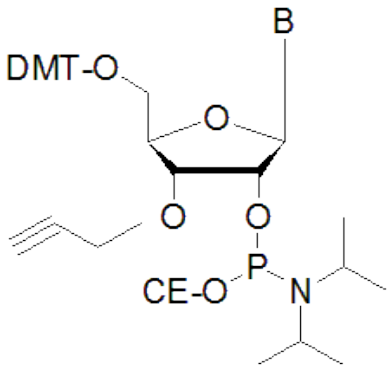
5'	B	Protection	Catalog #
O-DMT	A	*N*-Bz	N-8910
O-DMT	C	*N*-Bz	N-8920
O-DMT	G	*N*-iBu	N-8930
O-DMT	U	n/a	N-8940

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-8910-05 N-8910-10	2'-*O*-Propargyl Adenosine (*N*-Bz) 3'-Icaa CPG	500Å 1000Å	$65	$80	$95	$160	$190
N-8920-05 N-8920-10	2'-*O*-Propargyl Cytidine (*N*-Bz) 3'-Icaa CPG	500Å 1000Å	$65	$80	$95	$160	$190
N-8930-05 N-8930-10	2'-*O*-Propargyl Guanosine (*N*-iBu) 3'-Icaa CPG	500Å 1000Å	$65	$80	$95	$160	$190
N-8940-05 N-8940-10	2'-*O*-Propargyl Uridine 3'-Icaa CPG	500Å 1000Å	$65	$80	$95	$160	$190

The above Products are covered under ChemGenes patent, U.S. Patent No. 5,744,595

Oligo Synthesis Products

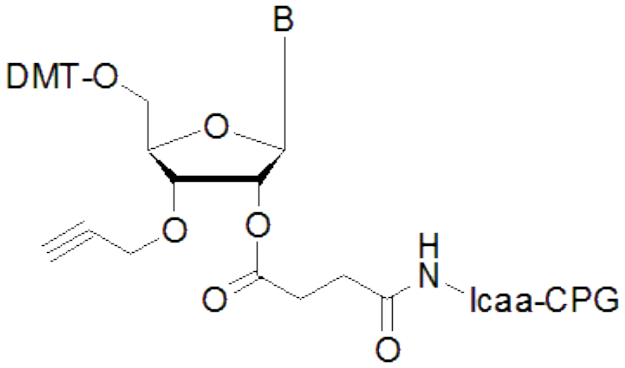
Amidites and Supports for Antisense Oligonucleotides



3'-O-Propargyl Amidites with Standard Base Protection

5'	B	Protection	Catalog#
O-DMT	A	*N*-Bz	ANP-9751
O-DMT	C	*N*-Bz	ANP-9752
O-DMT	G	*N*-iBu	ANP-9753
O-DMT	U	n/a	ANP-9754

Catalog #	Product Name	100μmole	250mg
ANP-9751	3'-*O*-Propargyl Adenosine (*N*-Bz) 2'-CEP, *M.W. 911.98*	$185	$360
ANP-9752	3'-*O*-Propargyl Cytidine (*N*-Bz) 2'-CEP, *M.W. 887.96*	$185	$360
ANP-9753	3'-*O*-Propargyl Guanosine (*N*-iBu) 2'-CEP, *M.W. 893.96*	$185	$360
ANP-9754	3'-*O*-Propargyl Uridine 2'-CEP, *M.W. 784.83*	$185	$360



3'-O-Propargyl Supports with Standard Base Protection

5'	B	Protection	Catalog #
O-DMT	A	*N*-Bz	N-9881
O-DMT	C	*N*-Bz	N-9882
O-DMT	G	*N*-iBu	N-9883
O-DMT	U	n/a	N-9884

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	pack of 4 cols. 0.2 μmole	pack of 4 cols. 1.0 μmole	pack of 10 cols. 0.2 μmole	pack of 10 cols. 1.0 μmole
N-9881-05 N-9881-10	3'-*O*-Propargyl Adenosine (*N*-Bz) 2'-Icaa CPG	500Å 1000Å	$65	$80	$95	$160	$190
N-9882-05 N-9882-10	3'-*O*-Propargyl Cytidine (*N*-Bz) 2'-Icaa CPG	500Å 1000Å	$65	$80	$95	$160	$190
N-9883-05 N-9883-10	3'-*O*-Propargyl Guanosine (*N*-iBu) 2'-Icaa CPG	500Å 1000Å	$65	$80	$95	$160	$190
N-9884-05 N-9884-10	3'-*O*-Propargyl Uridine 2'-Icaa CPG	500Å 1000Å	$65	$80	$95	$160	$190

The above Products are covered under ChemGenes patent, U.S. Patent No. 5,744,595

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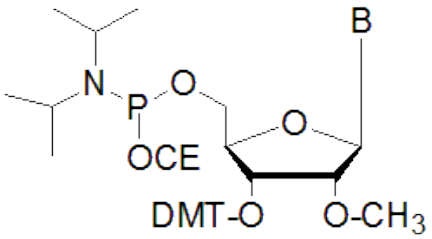


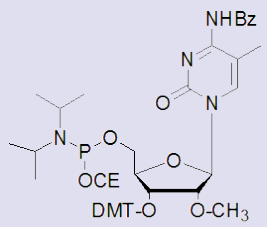
Reverse 2'-O-Methyl Amidites with Standard Base Protection

3'	B	Protection	Catalog#
O-DMT	A	*N*-Bz	ANP-1012
O-DMT	C	*N*-Bz	ANP-1013
O-DMT	G	*N*-iBu	ANP-1014
O-DMT	U	n/a	ANP-1015
O-DMT	C	*N*-Ac	ANP-1019

Catalog #	Product Name	100μmole	250mg
ANP-1012	2'-*O*-Methyl Adenosine (*N*-Bz) 5'-CEP, *M.W. 887.96*	$100	$240
ANP-1013	2'-*O*-Methyl Cytidine (*N*-Bz) 5'-CEP, *M.W. 863.93*	$100	$240
ANP-1014	2'-*O*-Methyl Guanosine (*N*-iBu) 5'-CEP, *M.W. 869.94*	$100	$240
ANP-1015	2'-*O*-Methyl Uridine 5'-CEP, *M.W. 760.85*	$100	$240
ANP-1019	2'-*O*-Methyl Cytidine (*N*-Ac) 5'-CEP, *M.W. 801.88*	$100	$240

3'-DMT-2'-O-Methyl-5-Methyl Cytidine 3'-CEP

3'-DMT-2'-O-Methyl-5-Methyl Cytidine (*N-Bz*) 3'-CEP



$C_{48}H_{56}N_5O_9P$
Mol. Wt.: 877.96

Catalog#

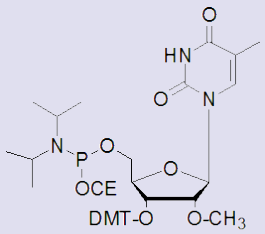
ANP-1016

Pricing

$85.00 / 50 μmole
$126.00 / 100 μmole

Purity: 98% +

3'-DMT-2'-O-Methyl-5-Methyl Uridine 3'-CEP



$C_{41}H_{51}N_4O_9P$
Mol. Wt.: 774.84

Catalog#

ANP-1017

Pricing

$85.00 / 50 μmole
$126.00 / 100 μmole

Purity: 98% +

Please Indicate Synthesizer when Ordering

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

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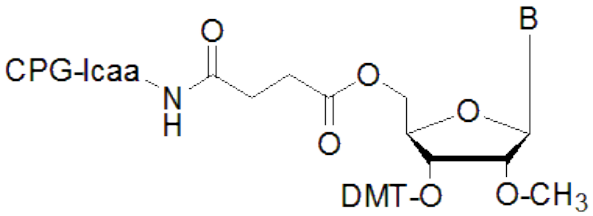

Reverse 2'-O-Methyl Supports with Standard Base Protection

3'	B	Protection	Catalog #
O-DMT	A	*N*-Bz	N-9912
O-DMT	C	*N*-Bz	N-9913
O-DMT	G	*N*-iBu	N-9914
O-DMT	U	n/a	N-9915
O-DMT	C	*N*-Ac	N-9919
O-DMT	5-Me-C	*N*-Bz	N-9916
O-DMT	5-Me-U	n/a	N-9917

Catalog #	Product Name	Pore Size	Bulk CPG 100 mg	pack of 4 cols. 0.2 µmole	pack of 4 cols. 1.0 µmole	pack of 10 cols. 0.2 µmole	pack of 10 cols. 1.0 µmole
N-9912-05 N-9912-10	2'-*O*-Methyl Adenosine (*N*-Bz) 5'-lcaa CPG	500Å 1000Å	$60	$65	$80	$130	$160
N-9913-05 N-9913-10	2'-*O*-Methyl Cytidine (*N*-Bz) 5'-lcaa CPG	500Å 1000Å	$60	$65	$80	$130	$160
N-9914-05 N-9914-10	2'-*O*-Methyl Guanosine (*N*-iBu) 5'-lcaa CPG	500Å 1000Å	$60	$65	$80	$130	$160
N-9915-05 N-9915-10	2'-*O*-Methyl Uridine 5'-lcaa CPG	500Å 1000Å	$60	$65	$80	$130	$160
N-9919-05 N-9919-10	2'-*O*-Methyl Cytidine (*N*-Ac) 5'-lcaa CPG	500Å 1000Å	$75	$75	$90	$150	$190
N-9916-05 N-9916-10	5-Methyl-2'-*O*-Methyl Cytidine (*N*-Bz) 5'-lcaa CPG	500Å 1000Å	$75	$75	$90	$150	$190
N-9917-05 N-9917-10	5-Methyl-2'-*O*-Methyl Uridine 5'-lcaa CPG	500Å 1000Å	$75	$95	$90	$150	$190

Please Indicate Synthesizer when Ordering

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

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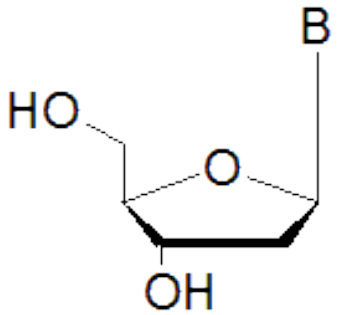
Unprotected Nucleosides



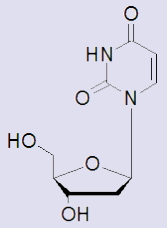
Deoxy Nucleosides

B	Catalog#
A	DN-1001
C	DN-1002
G	DN-1003
T	DN-1004

Catalog#	Product Name	1gm	5gm	25gm	100gm	500gm	1kg
DN-1001	deoxy Adenosine Monohydrate, *M.W. 269.26*	$6	$19	$ 73	$277	$1,277	$2,200
DN-1002	deoxy Cytidine Monhydrochloride, *M.W. 263.68*	$6	$19	$ 73	$277	$1,277	$2,200
DN-1003	deoxy Guanosine Monohydrate, *M.W. 285.26*	$9	$27	$103	$370	$1,437	$2,500
DN-1004	Thymidine, *M.W. 242.23*	$4	$12	$ 56	$195	$ 742	$1,290

Purity: All the above produced have a purity of 98% +

2'-deoxy Uridine



$C_9H_{12}N_2O_5$
Mol. Wt.: 228.20

Catalog#

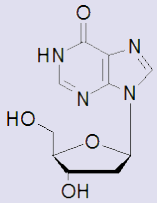
DN-6373

Pricing

$ 16.50 / 1 gm
$ 75.00 / 5 gm
$ 135.00 / 10 gm
$ 320.00 / 25 gm
$1,120.00 / 100 gm

Purity: 98% +

2'-deoxy Inosine



$C_{10}H_{12}N_4O_4$
Mol. Wt.: 252.23

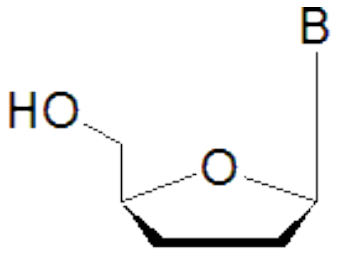
Catalog#

DN-4002

Pricing

$ 18.50 / 1 gm
$ 82.50 / 5 gm
$155.00 / 10 gm

Purity: 98% +

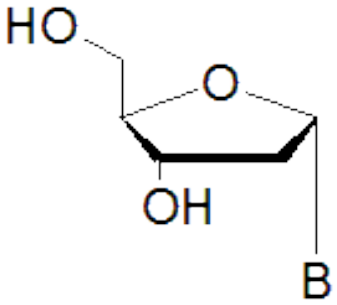


Dideoxy Nucleosides

B	Catalog#
A	DDN-1844
C	DDN-1868
G	DDN-1882
T	DDN-1883
U	DDN-1892

Catalog#	Product Name	100mg	1gm	5gm
DDN-1844	dideoxy Adenosine *M.W. 235.24*	$80	$250	$1,000
DDN-1868	dideoxy Cytidine *M.W. 211.22*	$80	$250	$1,000
DDN-1882	dideoxy Guanosine *M.W. 251.24*	$80	$250	$1,000
DDN-1883	dideoxy Thymidine *M.W. 226.23*	$80	$250	$1,000
DDN-1892	dideoxy Uridine *M.W. 212.20*	$80	$250	$1,000

Purity: All the above produced have a purity of 98% +



Alpha Nucleosides

B	Catalog#
A	DN-6351
C	DN-6352
G	DN-6353
T	DN-6354

Catalog#	Product Name	100mg	500mg	1gm
DN-6351	alpha deoxy Adenosine *M.W. 251.24*	$80	$250	$1,000
DN-6352	alpha deoxy Cytidine *M.W. 227.22*	$80	$250	$1,000
DN-6353	alpha deoxy Guanosine *M.W. 267.24*	$80	$250	$1,000
DN-6354	alpha deoxy Thymidine *M.W. 242.23*	$80	$250	$1,000

Purity: All the above produced have a purity of 98% +

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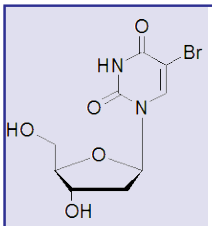
Modified Deoxy Nucleosides

5-Bromo deoxy Uridine



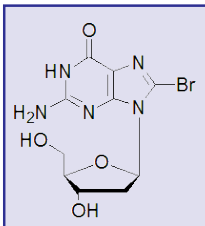
$C_9H_{11}BrN_2O_5$
Mol. Wt.: 307.10

Catalog# DN-1136

Pricing
$6.50 / 100 mg
$18.00 / 500 mg
$140.00 / 5 gm
$845.00 / 25 gm

Purity: 98% +

8-Bromo deoxy Guanosine



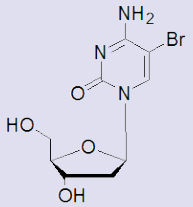
$C_{10}H_{12}BrN_5O_4$
Mol. Wt.: 346.14

Catalog# DN-1203

Pricing
$17.00 / 100 mg
$84.00 / 1 gm
$300.00 / 5 gm

Purity: 98% +

5-Bromo deoxy Cytidine



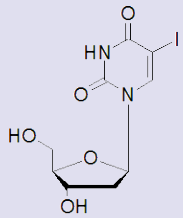
$C_9H_{12}BrN_3O_4$
Mol. Wt.: 306.11

Catalog# DN-6496

Pricing
$80.00 / 1 gm
$320.00 / 5 gm

Purity: 98% +

5-Iodo deoxy Uridine



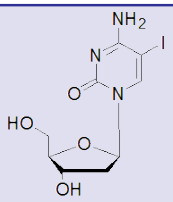
$C_9H_{11}IN_2O_5$
Mol. Wt.: 354.10

Catalog# DN-1180

Pricing
$10.00 / 500 mg
$15.00 / 1 gm
$62.00 / 5 gm
$210.00 / 25 gm
$760.00 / 100 gm

Purity: 98% +

5-Iodo deoxy Cytidine



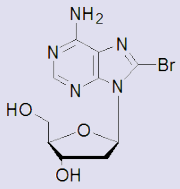
$C_9H_{12}IN_3O_4$
Mol. Wt.: 353.11

Catalog# DN-1181

Pricing
$36.00 / 1 gm
$324.00 / 10 gm

Purity: 98% +

8-Bromo deoxy Adenosine



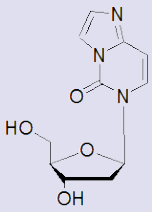
$C_{10}H_{12}BrN_5O_3$
Mol. Wt.: 330.14

Catalog# DN-1182

Pricing
$22.00 / 100 mg
$180.00 / 1 gm

Purity: 98% +

Etheno deoxy Cytidine



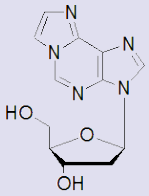
$C_{11}H_{13}N_3O_4$
Mol. Wt.: 251.24

Catalog# DN-4252

Pricing
$28.00 / 25 mg
$90.00 / 100 mg

Purity: 98% +

Etheno deoxy Adenosine



$C_{12}H_{13}N_5O_3$
Mol. Wt.: 275.26

Catalog# DN-4895

Pricing
$15.50 / 10 mg
$32.00 / 25 mg
$100.00 / 100 mg

Purity: 98% +

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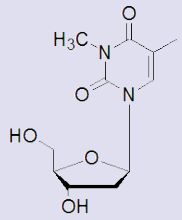
N^3-Methyl Thymidine



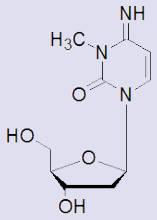
$C_{11}H_{16}N_2O_5$
Mol. Wt.: 256.26

Catalog#
DN-1599

Pricing
$ 42.00 / 25 mg
$126.00 / 100 mg

Purity: 98% +

N^3-Methyl deoxy Cytidine



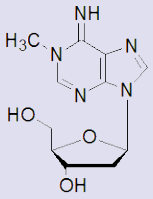
$C_{10}H_{15}N_3O_4$
Mol. Wt.: 241.24

Catalog#
DN-6493

Pricing
$110.00 / 25 mg
$375.00 / 100 mg

Purity: 98% +

N^1-Methyl deoxy Adenosine



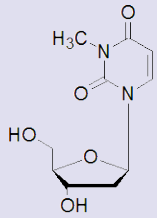
$C_{11}H_{15}N_5O_3$
Mol. Wt.: 265.27

Catalog#
DN-1597

Pricing
$120.00 / 25 mg
$382.00 / 100 mg

Purity: 98% +

N^3-Methyl deoxy Uridine



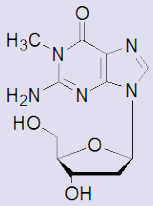
$C_{10}H_{14}N_2O_5$
Mol. Wt.: 242.23

Catalog#
DN-6495

Pricing
$ 80.00 / 25 mg
$275.00 / 100 mg

Purity: 98% +

N^1-Methyl deoxy Guanosine



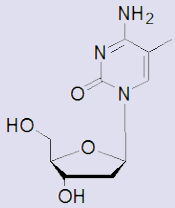
$C_{11}H_{15}N_5O_4$
Mol. Wt.: 281.27

Catalog#
DN-1598

Pricing
$120.00 / 25 mg
$382.00 / 100 mg

Purity: 98% +

5-Methyl deoxy Cytidine



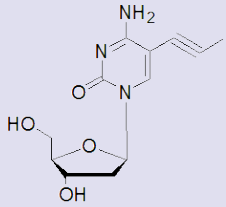
$C_{10}H_{15}N_3O_4$
Mol. Wt.: 241.24

Catalog#
DN-2013

Pricing
$ 18.00 / 25 mg
$ 52.00 / 100 mg
$180.00 / 500 mg
$355.00 / 1 gm

Purity: 98% +

5-Propynyl deoxy Cytidine



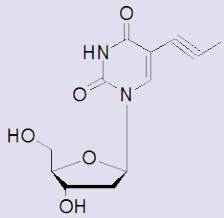
$C_{12}H_{15}N_3O_4$
Mol. Wt.: 265.27

Catalog#
DN-1541

Pricing
$115.00 / 10 mg
$225.00 / 25 mg

Purity: 98% +

5-Propynyl deoxy Uridine



$C_{12}H_{14}N_2O_5$
Mol. Wt.: 266.25

Catalog#
DN-1846

Pricing
$ 75.00 / 100 mg
$525.00 / 1 gm

Purity: 98% +

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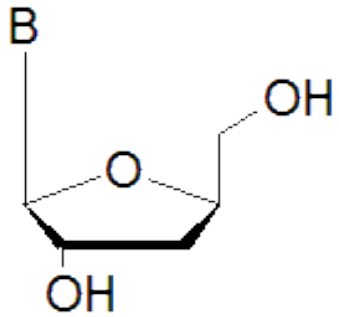

β-L-Deoxy Nucleosides

B	Catalog#
A	DN-8231
C	DN-8232
G	DN-8233
T	DN-8234
U	DN-8235

Catalog#	Product Name	100mg	500mg	1gm
DN-8231	β-L-deoxy Adenosine *M.W. 251.24*	$55	$195	$325
DN-8232	β-L-deoxy Cytidine *M.W. 227.22*	$55	$195	$325
DN-8233	β-L-deoxy Guanosine *M.W. 267.24*	$55	$195	$325
DN-8234	β-L-deoxy Thymidine *M.W. 242.23*	$55	$195	$325
DN-8235	β-L-deoxy Uridine *M.W. 228.20*	$55	$195	$325

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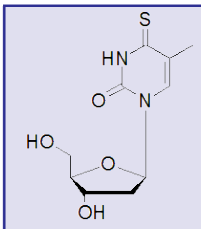
Modified Deoxy Nucleosides

4-Thio Thymidine



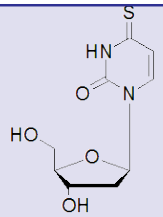
$C_{10}H_{14}N_2O_4S$
Mol. Wt.: 258.30

Catalog#
DN-1781

Pricing
$45.00 / 50 mg
$75.00 / 100 mg
$210.00 / 250 mg

Purity: 98% +

4-Thio deoxy Uridine



$C_9H_{12}N_2O_4S$
Mol. Wt.: 244.27

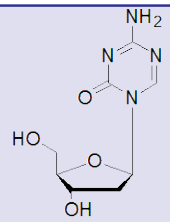
Catalog#
DN-1263

Pricing
$45.00 / 50 mg
$75.00 / 100 mg
$210.00 / 250 mg

Purity: 98% +

5-aza 2'-deoxy Cytidine

(4-Amino-1-{2-deoxy-ß-D-ribofuranosyl}-1,3,5-triazin-2(1H)-one



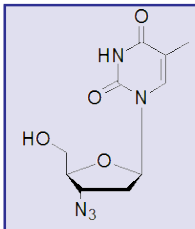
$C_8H_{12}N_4O_4$
Mol. Wt.: 228.21

Catalog#
DN-1771

Pricing
$42.00 / 10 mg
$154.00 / 50 mg
$264.00 / 100 mg

Purity: 98% +

3'-Azido 3'-deoxy Thymidine



$C_{10}H_{13}N_5O_4$
Mol. Wt.: 267.24

Catalog#
DN-1774

Pricing
$60.00 / 10 mg
$85.00 / 50 mg
$160.00 / 100 mg

Purity: 98% +

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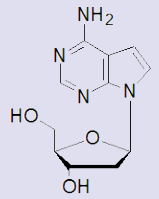
7-Deaza Deoxy Nucleosides

7-Deaza deoxy Adenosine



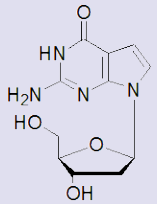
$C_{11}H_{14}N_4O_3$
Mol. Wt.: 250.25

Catalog#
DN-1143

Pricing
$ 45.00 / 100 mg
$225.00 / 500 mg
$400.00 / 1 gm

Purity: 98% +

7-Deaza-deoxy Guanosine



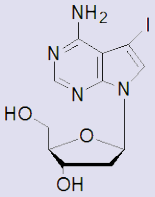
$C_{11}H_{14}N_4O_4$
Mol. Wt.: 266.25

Catalog#
DN-4567

Pricing
$ 45.00 / 100 mg
$225.00 / 500 mg
$400.00 / 1 gm

Purity: 98% +

7-Deaza-7-Iodo deoxy Adenosine



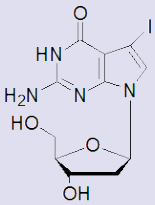
$C_{11}H_{13}IN_4O_3$
Mol. Wt.: 376.15

Catalog#
DN-2561

Pricing
$ 75.00 / 10 mg
$160.00 / 25 mg

Purity: 98% +

7-Deaza-7-Iodo deoxy Guanosine



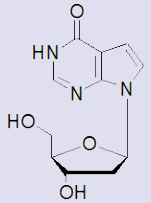
$C_{11}H_{13}IN_4O_4$
Mol. Wt.: 392.15

Catalog#
DN-2563

Pricing
$ 75.00 / 10 mg
$160.00 / 25 mg

Purity: 98% +

7-Deaza deoxy Inosine



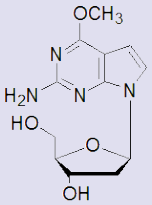
$C_{11}H_{13}N_3O_4$
Mol. Wt.: 251.24

Catalog#
DN-1145

Pricing
$ 45.00 / 100 mg
$225.00 / 500 mg
$400.00 / 1 gm

Purity: 98% +

7-Deaza-6-O-methyl deoxy Guanosine



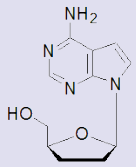
$C_{12}H_{16}N_4O_4$
Mol. Wt.: 280.28

Catalog#
DN-1147

Pricing
$ 45.00 / 100 mg
$225.00 / 500 mg
$400.00 / 1 gm

Purity: 98% +

7-Deaza-2',3'-dideoxy Adenosine



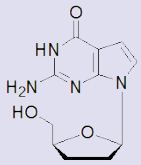
$C_{11}H_{14}N_4O_2$
Mol. Wt.: 234.25

Catalog#
DDN-3864

Pricing
$360.00 / 100 mg

Purity: 98% +

7-Deaza-2,3-dideoxy Gunaosine



$C_{11}H_{14}N_4O_3$
Mol. Wt.: 250.25

Catalog#
DDN-1863

Pricing
$360.00 / 100 mg

Purity: 98% +

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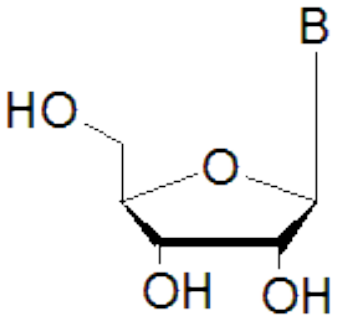


Ribo Nucleosides

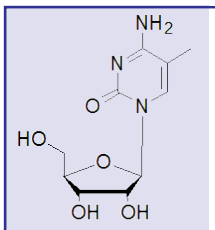
B	Catalog#
A	RP-1183
C	RP-1184
G	RP-1185
U	RP-1186
I	RP-1187

Catalog#	Product Name	1gm	5gm	100gm	1kg
RP-1183	ribo Adenosine *M.W. 267.25*	$4	$8	$48	$440
RP-1184	ribo Cytidine *M.W. 243.22*	$5	$13	$160	$950
RP-1185	ribo Guanosine *M.W. 283.24*	$4	$8	$75	$615
RP-1186	ribo Uridine *M.W. 244.20*	$4	$11	$146	$1,220
RP-1187	ribo Inosine *M.W. 268.23*	$4	$9	$88	$682

Purity: All the above produced have a purity of 98% +

Modified Ribo Nucleosides

5-Methyl Cytidine



$C_{10}H_{15}N_3O_5$
Mol. Wt.: 257.24

Catalog#

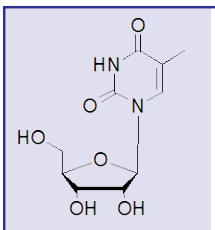
RP-1832

Pricing

$ 40.00 / 25 mg
$ 70.00 / 50 mg
$1,000.00 / 1 gm

Purity: 98% +

ribo Thymidine



$C_{10}H_{14}N_2O_6$
Mol. Wt.: 258.23

Catalog#

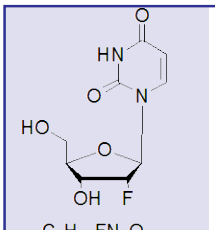
RP-1188

Pricing

$ 16.00 / 25 mg
$ 48.00 / 100 mg
$250.00 / 1 gm

Purity: 98% +

2'-Fluoro deoxy Uridine



$C_9H_{11}FN_2O_5$
Mol. Wt.: 246.19

Catalog#

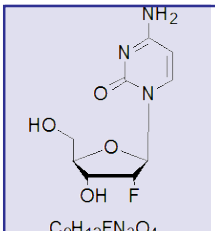
RP-1217

Pricing

$325.00 / 500 mg

Purity: 98% +

2'-Fluoro deoxy Cytidine



$C_9H_{12}FN_3O_4$
Mol. Wt.: 245.21

Catalog#

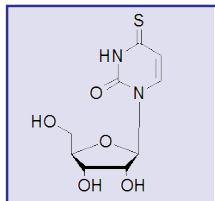
RP-1218

Pricing

$350.00 / 500 mg

Purity: 98% +

4-Thio Uridine



$C_9H_{12}N_2O_5S$
Mol. Wt.: 260.27

RP-2304

Pricing

$110.00 / 100 mg
$220.00 / 250 mg

Purity: 98% +

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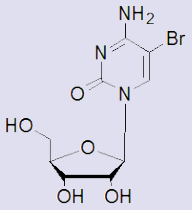
Modified Ribo Nucleosides

5-Bromo Cytidine



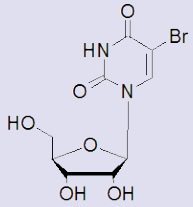
$C_9H_{12}BrN_3O_5$
Mol. Wt.: 322.11

Catalog# RP-1215

Pricing
$ 70.00 / 1 gm
$280.00 / 5 gm

Purity: 98% +

5-Bromo Uridine



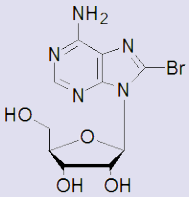
$C_9H_{11}BrN_2O_6$
Mol. Wt.: 323.10

Catalog# RP-1192

Pricing
$20.00 / 250 mg
$30.00 / 500 mg
$50.00 / 1 gm

Purity: 98% +

8-Bromo Adenosine



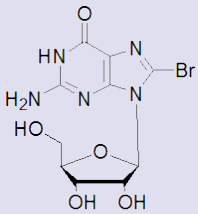
$C_{10}H_{12}BrN_5O_4$
Mol. Wt.: 346.14

Catalog# RP-1214

Pricing
$26.00 / 1 gm
$105.00 / 5 gm

Purity: 98% +

8-Bromo Guanosine



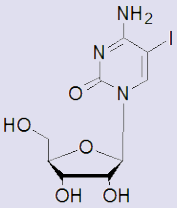
$C_{10}H_{12}BrN_5O_5$
Mol. Wt.: 362.14

Catalog# RP-1216

Pricing
$26.00 / 1 gm
$105.00 / 5 gm

Purity: 98% +

5-Iodo Cytidine



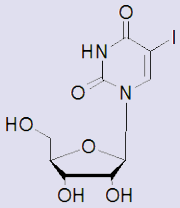
$C_9H_{12}IN_3O_5$
Mol. Wt.: 369.11

Catalog# RP-1221

Pricing
$35.50 / 25 mg
$87.20 / 100 mg

Purity: 98% +

5-Iodo Uridine



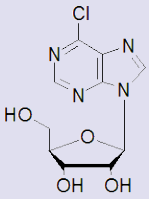
$C_9H_{11}IN_2O_6$
Mol. Wt.: 370.10

Catalog# RP-1089

Pricing
$ 16.50 / 250 mg
$ 30.00 / 500 mg
$ 50.00 / 1 gm
$210.00 / 5 gm

Purity: 98% +

6-Chloro Inosine



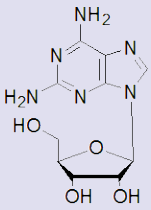
$C_{10}H_{11}ClN_4O_4$
Mol. Wt.: 286.67

Catalog# RP-6649

Pricing
$ 48.00 / 1 gm
$225.00 / 5 gm

Purity: 98% +

2,6-Diaminopurine riboside



$C_{10}H_{14}N_6O_4$
Mol. Wt.: 282.26

Catalog# RP-8334

Pricing
$ 28.00 / 1 gm
$224.00 / 10 gm

Purity: 98% +

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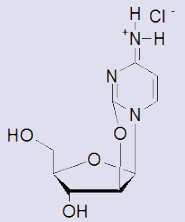
Modified Ribo Nucleosides

2,2'-Anhydro Cytidine-HCl
(Beta-D-O2, 2'-Cyclocytidine Ancitabine)



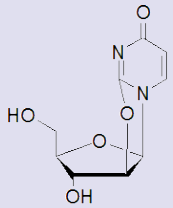
$C_9H_{12}ClN_3O_4$
Mol. Wt.: 261.66

Catalog# RP-3765

Pricing
$ 35.00 / 1 gm
$160.00 / 5 gm

Purity: 98% +

2,2'-Anhydro Uridine
(Beta-D-O2, 2'-Cyclouridine)



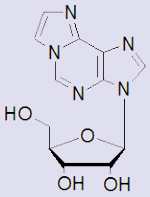
$C_9H_{10}N_2O_5$
Mol. Wt.: 226.19

Catalog# RP-4807

Pricing
$ 30.00 / 1 gm
$125.00 / 5 gm

Purity: 98% +

Etheno Adenosine



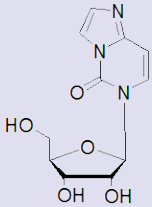
$C_{12}H_{13}N_5O_4$
Mol. Wt.: 291.26

Catalog# RP-2310

Pricing
$ 38.00 / 25 mg
$125.00 / 100 mg

Purity: 98% +

Etheno Cytidine



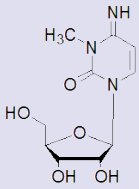
$C_{11}H_{13}N_3O_5$
Mol. Wt.: 267.24

Catalog# RP-2311

Pricing
$ 34.00 / 25 mg
$105.00 / 100 mg

Purity: 98% +

N^3-Methyl Cytidine



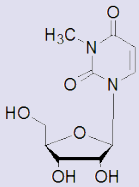
$C_{10}H_{15}N_3O_5$
Mol. Wt.: 257.24

Catalog# RP-2317

Pricing
$115.00 / 25 mg
$380.00 / 100 mg

Purity: 98% +

N^3-Methyl Uridine



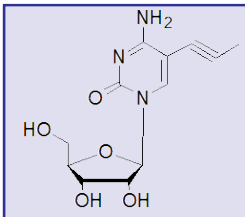
$C_{10}H_{14}N_2O_6$
Mol. Wt.: 258.23

Catalog# RP-1034

Pricing
$ 65.00 / 25 mg
$180.00 / 100 mg

Purity: 98% +

5-Propynyl Cytidine



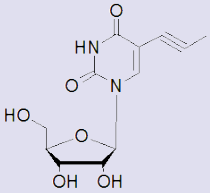
$C_{12}H_{15}N_3O_5$
Mol. Wt.: 281.26

Catalog# RP-1546

Pricing
$150.00 / 10 mg
$360.00 / 25 mg

Purity: 98% +

5-Propynyl ribo Uridine



$C_{12}H_{14}N_2O_6$
Mol. Wt.: 282.25

Catalog# RP-1842

Pricing
$ 90.00 / 100 mg
$720.00 / 1 gm

Purity: 98% +

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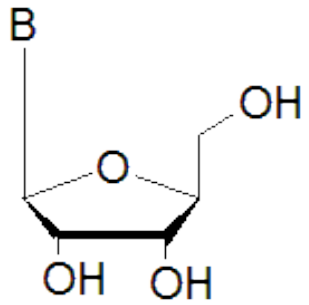


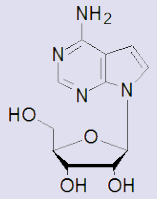
β-L Ribo Nucleosides

B	Catalog#
A	RP-9031
C	RP-9032
G	RP-9033
U	RP-9034
T	RP-9035
I	RP-9036

Catalog#	Product Name	10mg	25mg	100mg
RP-9031	β-L Adenosine *M.W. 287.24*	$65	$110	$285
RP-9032	β-L Cytidine *M.W. 243.22*	$65	$110	$285
RP-9033	β-L Guanosine *M.W. 283.24*	$78	$122	$326
RP-9034	β-L Uridine *M.W. 244.20*	$65	$110	$285
RP-9035	β-L ribo Thymidine *M.W. 258.23*	$75	$112	$310
RP-9036	β-L Inosine *M.W. 268.23*	$78	$122	$326

7-Deaza Ribo Nucleosides

7-Deaza ribo Adenosine
(Tubercidin)



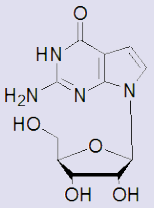
$C_{11}H_{14}N_4O_4$
Mol. Wt.: 266.25

Catalog#
RP-2312

Pricing
$ 18.50 / 10 mg
$132.00 / 100 mg
$215.00 / 250 mg

Purity: 98% +

7-Deaza ribo Guanosine



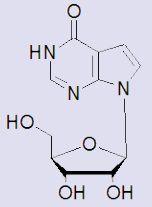
$C_{11}H_{14}N_4O_5$
Mol. Wt.: 282.25

Catalog#
RP-2313

Pricing
$ 18.50 / 10 mg
$112.00 / 100 mg
$209.50 / 250 mg

Purity: 98% +

7-Deaza ribo Inosine



$C_{11}H_{13}N_3O_5$
Mol. Wt.: 267.24

Catalog#
RP-2314

Pricing
$ 30.00 / 10 mg
$175.00 / 100 mg
$330.00 / 250 mg

Purity: 98% +

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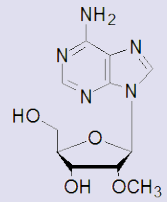
2'-O-Methyl Ribo Nucleosides

2'-(O-Methyl)-Adenosine



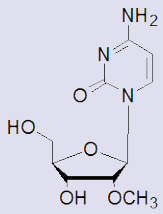
$C_{11}H_{15}N_5O_4$
Mol. Wt.: 281.27

Catalog# RP-1901

Pricing
$ 38.00 / 100 mg
$ 95.00 / 1 gm
$880.00 / 10 gm

Purity: 98% +

2'-(O-Methyl)-Cytidine



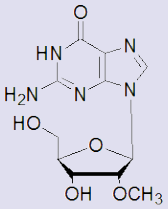
$C_{10}H_{15}N_3O_5$
Mol. Wt.: 257.24

Catalog# RP-1902

Pricing
$ 38.00 / 100 mg
$ 95.00 / 1 gm
$880.00 / 10 gm

Purity: 98% +

2'-(O-Methyl)-Guanosine



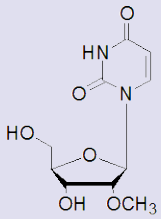
$C_{11}H_{15}N_5O_5$
Mol. Wt.: 297.27

Catalog# RP-1903

Pricing
$ 38.00 / 100 mg
$ 95.00 / 1 gm
$880.00 / 10 gm

Purity: 98% +

2'-(O-Methyl)-Uridine



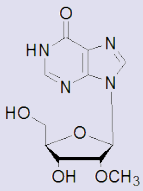
$C_{10}H_{14}N_2O_6$
Mol. Wt.: 258.23

Catalog# RP-1904

Pricing
$ 22.00 / 100 mg
$ 55.00 / 1 gm
$480.00 / 10 gm

Purity: 98% +

2'-(O-Methyl)-Inosine



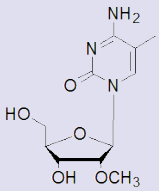
$C_{11}H_{14}N_4O_5$
Mol. Wt.: 282.25

Catalog# RP-1906

Pricing
$ 18.50 / 100 mg
$162.00 / 1 gm

Purity: 98% +

2'-(O-Methyl)-5-Methyl Cytidine



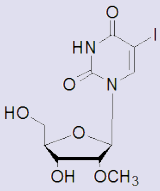
$C_{11}H_{17}N_3O_5$
Mol. Wt.: 271.27

Catalog# RP-1907

Pricing
$ 168.00 / 100 mg
$1345.00 / 1 gm

Purity: 98% +

2'-(O-Methyl)-5-Iodo Uridine



$C_{10}H_{13}IN_2O_6$
Mol. Wt.: 384.12

Catalog# RP-1905

Pricing
$112.00 / 100 mg
$600.00 / 1 gm

Purity: 98% +

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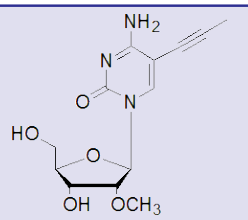
2'-O-Methyl Ribo Nucleosides

5-Propynyl-2'-(O-Methyl)-Cytidine



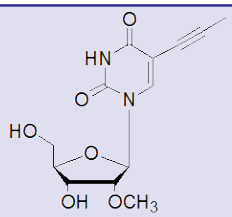
$C_{13}H_{17}N_3O_5$
Mol. Wt.: 295.29

Catalog#
RP-1548

Pricing
$210.00 / 10 mg
$422.00 / 25 mg

Purity: 98% +

5-Propynyl-2'-(O-Methyl)-Uridine



$C_{13}H_{16}N_2O_6$
Mol. Wt.: 296.28

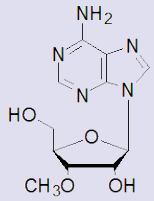
Catalog#
RP-1856

Pricing
$108.00 / 10 mg
$750.00 / 100 mg

Purity: 98% +

3'-O-Methyl Ribo Nucleosides

3'-(O-Methyl)-Adenosine



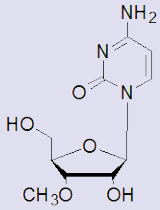
$C_{11}H_{15}N_5O_4$
Mol. Wt.: 281.27

Catalog#
RP-2911

Pricing
$ 50.00 / 10 mg
$350.00 / 100 mg

Purity: 98% +

3'-(O-Methyl)-Cytidine



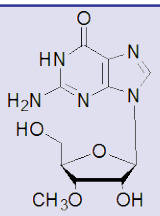
$C_{10}H_{15}N_3O_5$
Mol. Wt.: 257.24

Catalog#
RP-2912

Pricing
$ 44.00 / 10 mg
$305.00 / 100 mg

Purity: 98% +

3'-(O-Methyl)-Guanosine



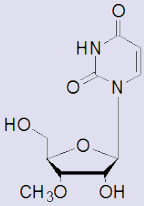
$C_{11}H_{15}N_5O_5$
Mol. Wt.: 297.27

Catalog#
RP-2913

Pricing
$ 55.00 / 10 mg
$360.00 / 100 mg

Purity: 98% +

3'-(O-Methyl)-Uridine



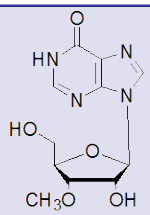
$C_{10}H_{14}N_2O_6$
Mol. Wt.: 258.23

Catalog#
RP-2914

Pricing
$ 32.00 / 10 mg
$250.00 / 100 mg

Purity: 98% +

3'-(O-Methyl)-Inosine



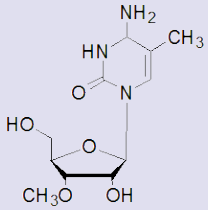
$C_{11}H_{14}N_4O_5$
Mol. Wt.: 282.25

Catalog#
RP-2915

Pricing
$ 60.00 / 10 mg
$420.00 / 100 mg

Purity: 98% +

3'-(O-Methyl)-5-Methyl Cytidine



$C_{11}H_{19}N_3O_5$
Mol. Wt.: 273.29

Catalog#
RP-2916

Pricing
$ 70.00 / 10 mg
$555.00 / 100 mg

Purity: 98% +

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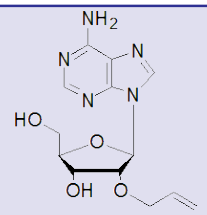
2'-O-Allyl Ribo Nucleosides

2'-(O-Allyl) Adenosine



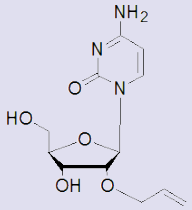
$C_{13}H_{17}N_5O_4$
Mol. Wt.: 307.31

Catalog#
RP-3511

Pricing
$ 44.00 / 10 mg
$308.00 / 100 mg

Purity: 98% +

2'-(O-Allyl) Cytidine



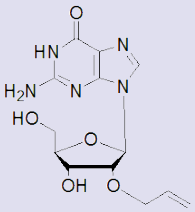
$C_{12}H_{17}N_3O_5$
Mol. Wt.: 283.28

Catalog#
RP-3512

Pricing
$ 44.00 / 10 mg
$308.00 / 100 mg

Purity: 98% +

2'-(O-Allyl) Guanosine



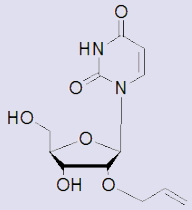
$C_{13}H_{17}N_5O_5$
Mol. Wt.: 323.30

Catalog#
RP-3513

Pricing
$ 44.00 / 10 mg
$308.00 / 100 mg

Purity: 98% +

2'-(O-Allyl) Uridine



$C_{12}H_{16}N_2O_6$
Mol. Wt.: 284.27

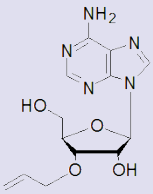
Catalog#
RP-3514

Pricing
$ 38.00 / 10 mg
$266.00 / 100 mg

Purity: 98% +

3'-O-Allyl Ribo Nucleosides

3'-(O-Allyl) Adenosine



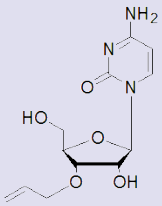
$C_{13}H_{17}N_5O_4$
Mol. Wt.: 307.31

Catalog#
RP-3111

Pricing
$ 48.00 / 10 mg
$336.00 / 100 mg

Purity: 98% +

3'-(O-Allyl) Cytidine



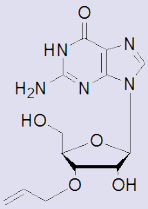
$C_{12}H_{17}N_3O_5$
Mol. Wt.: 283.28

Catalog#
RP-3112

Pricing
$ 46.00 / 10 mg
$322.00 / 100 mg

Purity: 98% +

3'-(O-Allyl) Guanosine



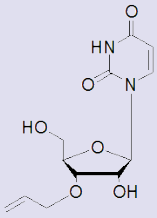
$C_{13}H_{17}N_5O_5$
Mol. Wt.: 323.30

Catalog#
RP-3113

Pricing
$ 52.00 / 10 mg
$364.00 / 100 mg

Purity: 98% +

3'-(O-Allyl) Uridine



$C_{12}H_{16}N_2O_6$
Mol. Wt.: 284.27

Catalog#
RP-3114

Pricing
$ 46.00 / 10 mg
$322.00 / 100 mg

Purity: 98% +

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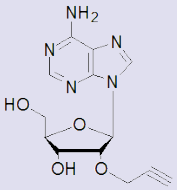
2'-O-Propargyl Ribo Nucleosides

2'-(O-Propargyl) Adenosine



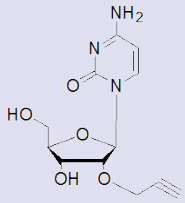
$C_{13}H_{15}N_5O_4$
Mol. Wt.: 305.29

Catalog#
RP-3401

Pricing
$ 60.00 / 10 mg
$420.00 / 100 mg

Purity: 98% +

2'-(O-Propargyl) Cytidine



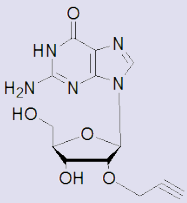
$C_{12}H_{15}N_3O_5$
Mol. Wt.: 281.26

Catalog#
RP-3402

Pricing
$ 60.00 / 10 mg
$420.00 / 100 mg

Purity: 98% +

2'-(O-Propargyl) Guanosine



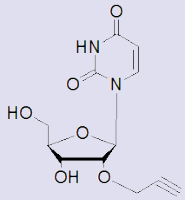
$C_{13}H_{15}N_5O_5$
Mol. Wt.: 321.29

Catalog#
RP-3403

Pricing
$ 60.00 / 10 mg
$420.00 / 100 mg

Purity: 98% +

2'-(O-Propargyl) Uridine



$C_{12}H_{14}N_2O_6$
Mol. Wt.: 282.25

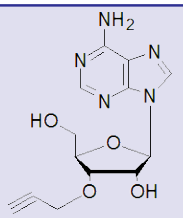
Catalog#
RP-3404

Pricing
$ 50.00 / 10 mg
$350.00 / 100 mg

Purity: 98% +

3'-O-Propargyl Ribo Nucleosides

3'-(O-Propargyl) Adenosine



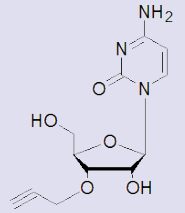
$C_{13}H_{15}N_5O_4$
Mol. Wt.: 305.29

Catalog#
RP-3301

Pricing
$ 48.00 / 10 mg
$336.00 / 100 mg

Purity: 98% +

3'-(O-Propargyl) Cytidine



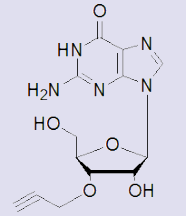
$C_{12}H_{15}N_3O_5$
Mol. Wt.: 281.26

Catalog#
RP-3302

Pricing
$ 46.00 / 10 mg
$322.00 / 100 mg

Purity: 98% +

3'-(O-Propargyl) Guanosine



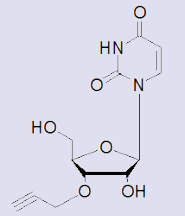
$C_{13}H_{15}N_5O_5$
Mol. Wt.: 321.29

Catalog#
RP-3303

Pricing
$ 52.00 / 10 mg
$364.00 / 100 mg

Purity: 98% +

3'-(O-Propargyl) Uridine



$C_{12}H_{14}N_2O_6$
Mol. Wt.: 282.25

Catalog#
RP-3304

Pricing
$ 46.00 / 10 mg
$320.00 / 100 mg

Purity: 98% +

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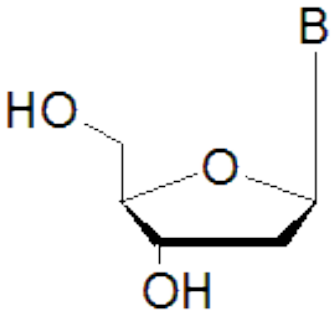

Base Protected (Standard & Labile) deoxy Nucleosides

B	Protection	Catalog#
A	*N*-Bz	PM-1101
C	*N*-Bz	PM-1102
G	*N*-iBu	PM-1103
C	*N*-iBu	PM-1104
C	*N*-Ac	PM-1105
A	*N*-PAC	PM-9996
C	*N*-PAC	PM-9997
G	*N*-PAC	PM-9998
A	*N,N*-DMF	PM-1588
G	*N,N*-DMF	PM-3183

Catalog#	Product Name	1gm	5gm	10gm
PM-1101	deoxy Adenosine (*N*-Bz) *M.W. 355.35*	$12	$55	$ 99
PM-1102	deoxy Cytidine (*N*-Bz) *M.W. 331.32*	$12	$55	$ 99
PM-1103	deoxy Guanosine (*N*-iBu) *M.W. 337.33*	$15	$60	$108
PM-1104	deoxy Cytidine (*N*-iBu) *M.W. 297.31*	$15	$70	$126
PM-1105	deoxy Cytidine (*N*-Ac) *M.W. 269.25*	$18	$85	$153
PM-9996	deoxy Adenosine (*N*-PAC) *M.W. 385.37*	$22	$82	$148
PM-9997	deoxy Cytidine (*N*-PAC) *M.W. 361.35*	$22	$82	$148
PM-9998	deoxy Guanosine (*N*-PAC) *M.W. 401.37*	$22	$82	$148
PM-1588	deoxy Adenosine (*N,N*-DMF) *M.W. 306.32*	$15	$65	$117
PM-3183	deoxy Guanosine (*N,N*-DMF) *M.W. 322.32*	$15	$65	$117

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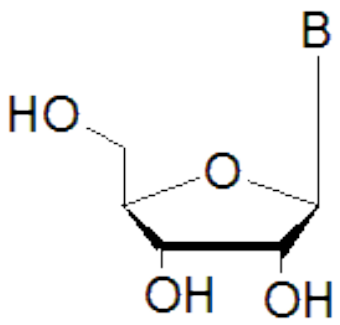


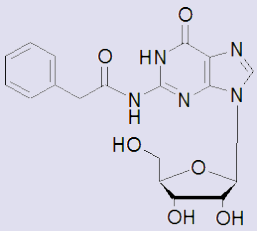
Base Protected (Standard & Labile) Ribo Nucleosides

B	Protection	Catalog#
A	*N*-Bz	PM-2101
C	*N*-Bz	PM-2102
G	*N*-iBu	PM-2103
C	*N*-iBu	PM-2105
C	*N*-Ac	PM-2106
A	*N*-PAC	PM-6001
C	*N*-PAC	PM-6002
G	*N*-PAC	PM-6003

Catalog#	Productname	1gm	5gm
PM-2101	Adenosine (*N*-Bz) *M.W. 371.35*	$27	$125
PM-2102	Cytidine (*N*-Bz) *M.W. 347.32*	$27	$125
PM-2103	Guanosine (*N*-iBu) *M.W. 353.33*	$33	$130
PM-2105	Cytidine (*N*-iBu) *M.W. 313.31*	$33	$130
PM-2106	Cytidine (*N*-Ac) *M.W. 285.25*	$37	$155
PM-6001	Adenosine (*N*-PAC) *M.W. 401.37*	$40	$180
PM-6002	Cytidine (*N*-PAC) *M.W. 377.35*	$40	$180
PM-6003	Guanosine (*N*-PAC) *M.W. 417.37*	$40	$180

Purity : All the above Products have a purity of 98% +

ribo Guanosine (N-phenyl acetyl)



$C_{18}H_{19}N_5O_6$
Mol. Wt.: 401.37

Catalog#

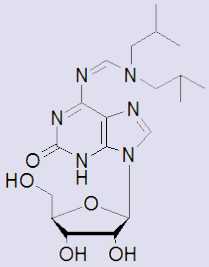
PM-6004

Pricing

$ 40.00 / 1 gm
$180.00 / 5 gm

Purity: 98% +

ribo isoGuanosine (N,N-diisobutylformadine)



$C_{19}H_{30}N_6O_5$
Mol. Wt.: 422.48

Catalog#

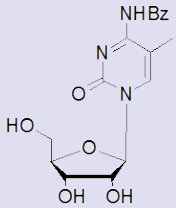
PM-2643

Pricing

$ 22.50 / 10 mg
$165.00 / 100 mg
$310.00 / 250 mg

Purity: 98% +

5-Methyl Cytidine (N-Bz)



$C_{17}H_{19}N_3O_6$
Mol. Wt.: 361.35

Catalog#

PM-4122

Pricing

$ 32.00 / 25 mg
$ 75.00 / 100 mg
$455.00 / 1 gm

Purity: 98% +

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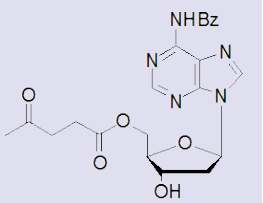
5'-Levulinyl Nucleosides

5'-Levulinyl deoxy Adenosine (N-Bz)



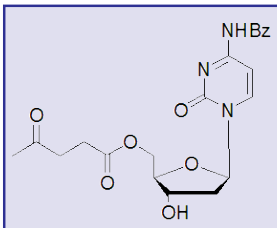
$C_{22}H_{23}N_5O_6$
Mol. Wt.: 453.45

Catalog# DN-6601

Pricing
$ 40.00 / 1 gm
$180.00 / 5 gm

Purity: 98% +

5'-Levulinyl deoxy Cytidine (N-Bz)



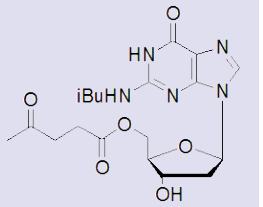
$C_{21}H_{23}N_3O_7$
Mol. Wt.: 429.42

Catalog# DN-6602

Pricing
$ 40.00 / 1 gm
$180.00 / 5 gm

Purity: 98% +

5'-Levulinyl deoxy Guanosine (N-iBu)



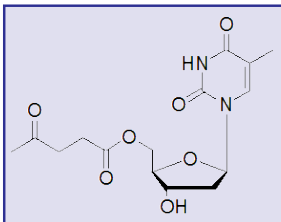
$C_{19}H_{25}N_5O_7$
Mol. Wt.: 435.43

Catalog# DN-6603

Pricing
$ 40.00 / 1 gm
$180.00 / 5 gm

Purity: 98% +

5'-Levulinyl Thymidine



$C_{15}H_{20}N_2O_7$
Mol. Wt.: 340.33

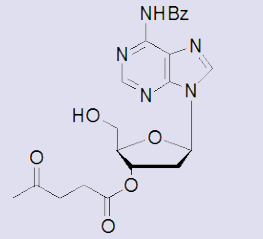
Catalog# DN-6604

Pricing
$ 35.00 / 1 gm
$160.00 / 5 gm

Purity: 98% +

3'-Levulinyl Nucleosides

3'-Levulinyl deoxy Adenosine (N-Bz)



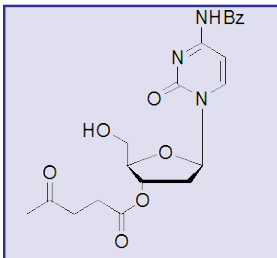
$C_{22}H_{23}N_5O_6$
Mol. Wt.: 453.45

Catalog# PM-6611

Pricing
$100.00 / 1 gm
$475.00 / 5 gm

Purity: 98% +

3'-Levulinyl deoxy Cytidine (N-Bz)



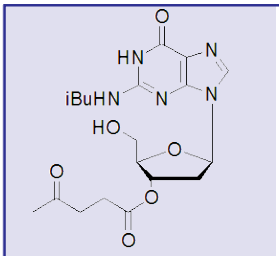
$C_{21}H_{23}N_3O_7$
Mol. Wt.: 429.42

Catalog# PM-6612

Pricing
$100.00 / 1 gm
$475.00 / 5 gm

Purity: 98% +

3'-Levulinyl deoxy Guanosine (N-iBu)



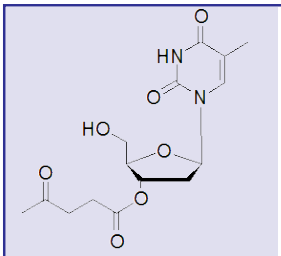
$C_{19}H_{25}N_5O_7$
Mol. Wt.: 435.43

Catalog# PM-6613

Pricing
$100.00 / 1 gm
$475.00 / 5 gm

Purity: 98% +

3'-Levulinyl Thymidine



$C_{15}H_{20}N_2O_7$
Mol. Wt.: 340.33

Catalog# PM-6614

Pricing
$ 90.00 / 1 gm
$425.00 / 5 gm

Purity: 98% +

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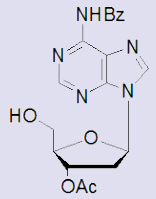
Acetyl & Isopropylidine Ribo Nucleosides

3'-(O-Acetyl) Adenosine (N-Bz)



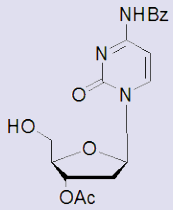
$C_{19}H_{19}N_5O_5$
Mol. Wt.: 397.38

Catalog#
PM-6301

Pricing
$ 90.00 / 1 gm
$425.00 / 5 gm

Purity: 98% +

3'-(O-Acetyl) Cytidine (N-Bz)



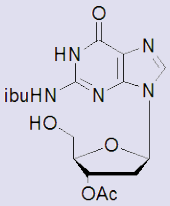
$C_{18}H_{19}N_3O_6$
Mol. Wt.: 373.36

Catalog#
PM-6302

Pricing
$ 90.00 / 1 gm
$425.00 / 5 gm

Purity: 98% +

3'-(O-Acetyl) Guanosine (N-iBu)



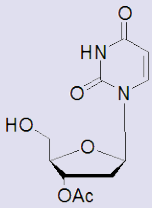
$C_{16}H_{21}N_5O_6$
Mol. Wt.: 379.37

Catalog#
PM-6303

Pricing
$ 90.00 / 1 gm
$425.00 / 5 gm

Purity: 98% +

3'-(O-Acetyl) Uridine



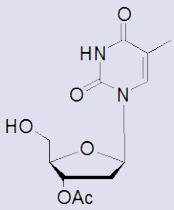
$C_{11}H_{14}N_2O_6$
Mol. Wt.: 270.24

Catalog#
PM-6305

Pricing
$ 45.00 / 1 gm
$212.00 / 5 gm

Purity: 98% +

3'-(O-Acetyl) Thymidine



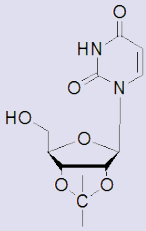
$C_{12}H_{16}N_2O_6$
Mol. Wt.: 284.27

Catalog#
PM-6304

Pricing
$ 45.00 / 1 gm
$212.00 / 5 gm

Purity: 98% +

Uridine-2',3'-isopropylidine



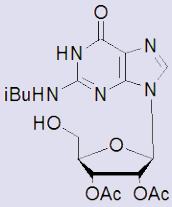
$C_{12}H_{16}N_2O_6$
Mol. Wt.: 284.27

Catalog#
RP-4129

Pricing
$ 65.00 / 1 gm
$260.00 / 5 gm

Purity: 98% +

2',3'-Diacetyl Guanosine (N-iBu)



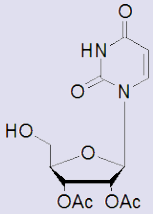
$C_{18}H_{23}N_5O_8$
Mol. Wt.: 437.40

Catalog#
RP-2282

Pricing
$ 90.00 / 1 gm
$360.00 / 5 gm

Purity: 98% +

2',3'-Diacetyl Uridine



$C_{13}H_{16}N_2O_8$
Mol. Wt.: 328.27

Catalog#
RP-2249

Pricing
$ 65.00 / 1 gm
$260.00 / 5 gm

Purity: 98% +

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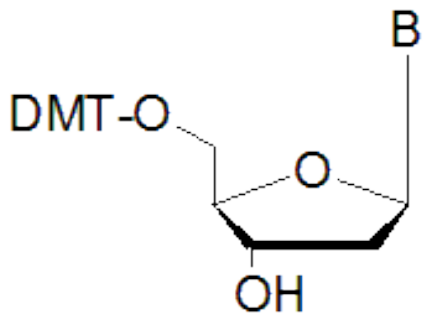
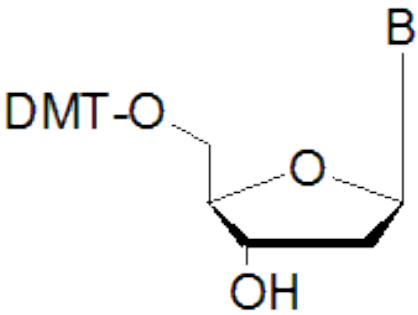


DMT Protected and base Protected (Standard & Labile) deoxy Nucleosides

B	Protection	Catalog#
A	*N*-Bz	PM-1109
C	*N*-Bz	PM-1110
G	*N*-iBu	PM-1111
T	n/a	PM-1112
C	*N*-iBu	PM-1117
C	*N*-Ac	PM-1118
A	*N*-Ac	PM-3015
A	*N*-PAC	PM-3101
C	*N*-PAC	PM-3102
G	*N*-PAC	PM-3103
G	*N*-tBPAC	PM-1483 NEW!
G	*N*-iPrPAC	PM-1484 NEW!

Catalog#	Product Name	1gm	5gm	10gm	100gm
PM-1109	5'-DMT deoxy Adenosine (*N*-Bz) *M.W. 657.71*	$18	$ 80	$145	$1,200
PM-1110	5'-DMT deoxy Cytidine (*N*-Bz) *M.W. 633.69*	$18	$ 80	$145	$1,200
PM-1111	5'-DMT deoxy Guanosine (*N*-iBu) *M.W. 639.70*	$18	$ 80	$145	$1,200
PM-1112	5'-DMT Thymidine *M.W. 544.60*	$12	$ 52	$ 92	$ 850
PM-1117	5'-DMT deoxy Cytidine (*N*-iBu) *M.W. 599.67*	$18	$ 80	$145	$1,200
PM-1118	5'-DMT deoxy Cytidine (*N*-Ac) *M.W. 571.82*	$18	$ 80	$145	$1,200
PM-3015	5'-DMT deoxy Adenosine (*N*-Ac)*M.W. 595.65*	$25	$112	$198	$1,782
PM-3101	5'-DMT deoxy Adenosine (*N*-PAC)*M.W. 687.74*	$25	$112	$198	$1,782
PM-3102	5'-DMT deoxy Cytidine (*N*-PAC) *M.W. 663.7*	$25	$112	$198	$1,782
PM-3103	5'-DMT deoxy Guanosine (*N*-PAC)*M.W. 703.74*	$28	$126	$224	$2,000
PM-1483 NEW!	5'-DMT deoxy Guanosine (*N*-tBPAC)*M.W. 759.85*	$40	$190	$342	$3,000
PM-1484 NEW!	5'-DMT deoxy Guanosine (*N*-isopropyl-PAC)*M.W. 745.82*	$40	$190	$342	$3,000

Purity: Ultrapure product: > 98.5% +



DMT Protected Labile Fmoc deoxy Nucleosides

B	Protection	Catalog#
A	*N*-Fmoc	PM-4321 NEW!
C	*N*-Fmoc	PM-4322 NEW!
G	*N*-Fmoc	PM-4333 NEW!

Catalog #	Product Name	1gm	5gm	10gm
PM-4321	5'-DMT-deoxy Adenosine (*N*-Fmoc)	$25	$112	$198
PM-4322	5'-DMT-deoxy Cytidine (*N*-Fmoc)	$25	$112	$198
PM-4333	5'-DMT-deoxy Guanosine (*N*-Fmoc)	$25	$112	$198

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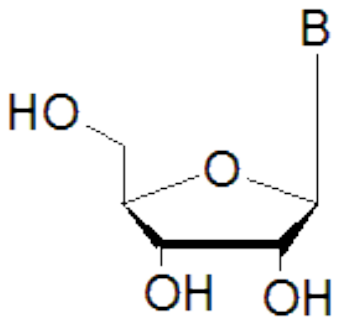
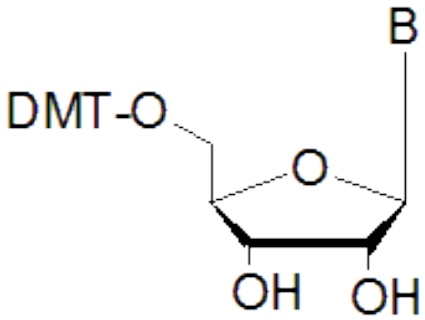


DMT Protected Standard & Labile Ribo Nucleosides

B	Protection	Catalog#
A	*N*-Bz	PM-2109
C	*N*-Bz	PM-2110
G	*N*-iBu	PM-2111
U	n/a	PM-2112
C	*N*-iBu	PM-2113
C	*N*-Ac	PM-2114
A	*N*-PAC	PM-2203
C	*N*-PAC	PM-2204
G	*N*-PAC	PM-2205

Catalog#	Product Name	1gm	5gm	10gm
PM-2109	5'-DMT Adenosine (*N*-Bz) *M.W. 673.71*	$33	$142	$256
PM-2110	5'-DMT Cytidine (*N*-Bz) *M.W. 649.69*	$33	$142	$256
PM-2111	5'-DMT Guanosine (*N*-iBu) *M.W. 655.70*	$35	$148	$265
PM-2112	5'-DMT Uridine *M.W. 546.57*	$26	$128	$230
PM-2113	5'-DMT Cytidine (*N*-iBu) *M.W. 615.67*	$40	$142	$333
PM-2114	5'-DMT Cytidine (*N*-Ac) *M.W. 587.82*	$42	$185	$145
PM-2203	5'-DMT Adenosine (*N*-PAC) *M.W. 703.74*	$35	$148	$245
PM-2204	5'-DMT Cytidine (*N*-PAC) *M.W. 679.72*	$35	$148	$245
PM-2205	5'-DMT Guanosine (*N*-PAC) *M.W. 719.74*	$35	$148	$245

Purity: All the above produced have a purity of 98.5% +



DMT Protected Labile Fmoc Nucleosides

B	Protection	Catalog#
A	*N*-Fmoc	PM-4366 NEW!
C	*N*-Fmoc	PM-4367 NEW!
G	*N*-Fmoc	PM-4368 NEW!

Catalog #	Product Name	1gm	5gm	10gm
PM-4366	5'-DMT-Ribo Adenosine (*N*-Fmoc)	$25	$112	$198
PM-4367	5'-DMT-Ribo Cytidine (*N*-Fmoc)	$25	$112	$198
PM-4368	5'-DMT-Ribo Guanosine (*N*-Fmoc)	$25	$112	$198

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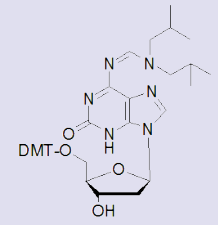
DMT Protected Modified Deoxy Nucleosides

5'-DMT deoxy isoGuanosine (*N,N*-diisobutylformamidine)



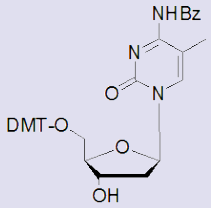
$C_{40}H_{48}N_6O_6$
Mol. Wt.: 708.85

Catalog# PM-1643

Pricing $425.00 / 1 gm

Purity: 98% +

5'-DMT-5-Methyl deoxy Cytidine (*N-Bz*)



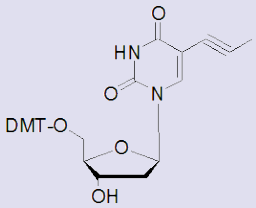
$C_{38}H_{37}N_3O_7$
Mol. Wt.: 647.72

Catalog# PM-1967

Pricing $ 45.00 / 1 gm
$200.00 / 5 gm

Purity: 98% +

5'-DMT-5-Propynyl deoxy Uridine



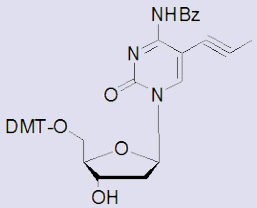
$C_{33}H_{32}N_2O_7$
Mol. Wt.: 568.62

Catalog# PM-1022

Pricing $165.00 / 100 mg
$800.00 / 1 gm

Purity: 98% +

5'-DMT-5-Propynyl deoxy Cytidine (*N-Bz*)



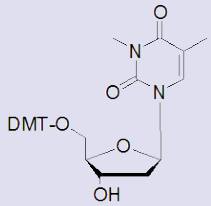
$C_{40}H_{37}N_3O_7$
Mol. Wt.: 671.74

Catalog# PM-1124

Pricing $110.00 / 100 mg
$905.00 / 1 gm

Purity: 98% +

5'-DMT-N^3-Methyl Thymidine



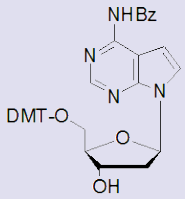
$C_{32}H_{34}N_2O_7$
Mol. Wt.: 558.62

Catalog# PM-1591

Pricing $ 65.00 / 1 gm
$216.00 / 5 gm

Purity: 98% +

5'-DMT-7-deaza deoxy Adenosine (*N-Bz*)



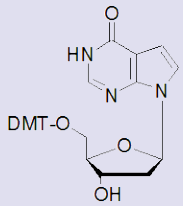
$C_{39}H_{36}N_4O_6$
Mol. Wt.: 656.73

Catalog# PM-6431

Pricing $ 450.00 / 1 gm
$1,800.00 / 5 gm

Purity: 98% +

5'-DMT-7-deaza deoxy Inosine



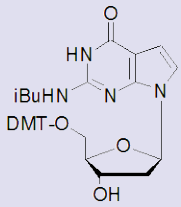
$C_{32}H_{31}N_3O_6$
Mol. Wt.: 553.61

Catalog# PM-6434

Pricing $ 450.00 / 1 gm
$1,800.00 / 5 gm

Purity: 98% +

5'-DMT-7-deaza deoxy Guanosine (*N-iBu*)



$C_{36}H_{38}N_4O_7$
Mol. Wt.: 638.71

Catalog# PM-6433

Pricing $ 450.00 / 1 gm
$1,800.00 / 5 gm

Purity: 98% +

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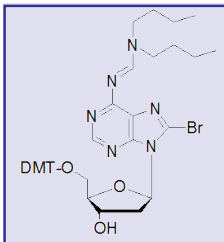
DMT Protected Modified Deoxy Nucleosides

5'-DMT 8-Bromo deoxy Adenosine (*N,N-dibuf*)



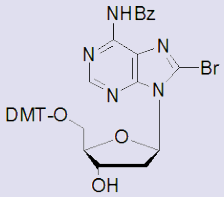
$C_{40}H_{47}BrN_6O_5$
Mol. Wt.: 771.74

Catalog# PM-4791

Pricing
$165.00 / 1 gm
$650.00 / 5 gm

Purity: 98% +

5'-DMT-8-Bromo deoxy Adenosine (*N-Bz*)



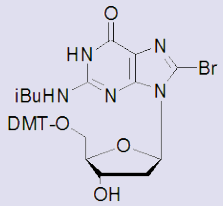
$C_{38}H_{34}BrN_5O_6$
Mol. Wt.: 736.61

Catalog# PM-7210

Pricing
$150.00 / 1 gm
$600.00 / 5 gm

Purity: 98% +

5'-DMT 8-Bromo deoxy Guanosine (*N-iBu*)



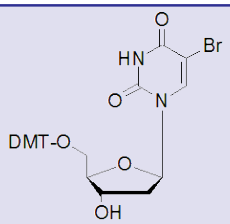
$C_{35}H_{36}BrN_5O_7$
Mol. Wt.: 718.59

Catalog# PM-7211

Pricing
$150.00 / 1 gm
$600.00 / 5 gm

Purity: 98% +

5'-DMT-5-Bromo deoxy Uridine



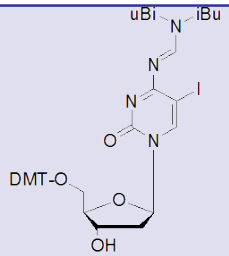
$C_{30}H_{29}BrN_2O_7$
Mol. Wt.: 609.46

Catalog# PM-2808

Pricing
$ 45.00 / 1 gm
$186.00 / 5 gm

Purity: 98% +

5'-DMT-5-Iodo deoxy Cytidine (*N,N-isobudmf*)



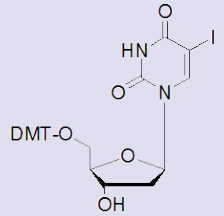
$C_{39}H_{43}IN_4O_8$
Mol. Wt.: 822.69

Catalog# PM-1979

Pricing
$150.00 / 1 gm

Purity: 98% +

5'-DMT-5-Iodo deoxy Uridine



$C_{30}H_{29}IN_2O_7$
Mol. Wt.: 656.47

Catalog# PM-2864

Pricing
$ 45.00 / 1 gm
$186.00 / 5 gm

Purity: 98% +

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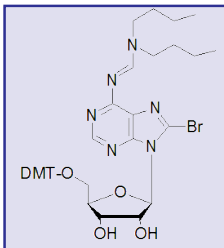
DMT Protected Modified Ribo Nucleosides

5'-DMT-8-Bromo Adenosine (*N,N-dibutyl-dmf*)



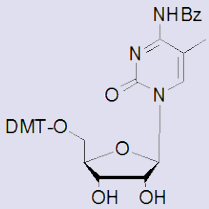
$C_{40}H_{47}BrN_6O_6$
Mol. Wt.: 787.74

Catalog# PM-1834

Pricing $160.00 / 1 gm

Purity: 98% +

5'-DMT-5-Methyl Cytidine (*N-Bz*)



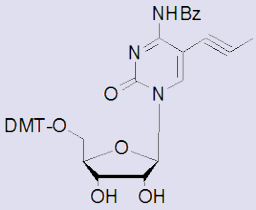
$C_{38}H_{37}N_3O_8$
Mol. Wt.: 663.72

Catalog# PM-2647

Pricing $134.00 / 1 gm

Purity: 98% +

5'-DMT-5-Propynyl Cytidine (*N-Bz*)



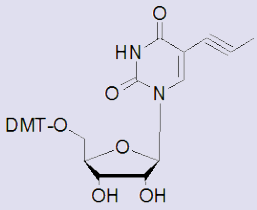
$C_{40}H_{37}N_3O_8$
Mol. Wt.: 687.74

Catalog# PM-1126

Pricing $115.00 / 100 mg
$910.00 / 1 gm

Purity: 98% +

5'-DMT-5-Propynyl Uridine



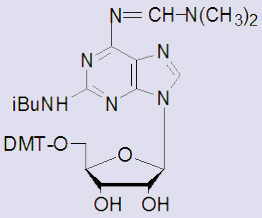
$C_{33}H_{32}N_2O_8$
Mol. Wt.: 584.62

Catalog# PM-1024

Pricing $ 180.00 / 100 mg
$1,260.00 / 1 gm

Purity: 98% +

5'-DMT-2,6-diamino purine riboside (N^6,N^6-DMF) (N^2-iBu)



$C_{38}H_{43}N_7O_7$
Mol. Wt.: 709.79

Catalog# PM-2476

Pricing $115.00 / 1 gm

Purity: 98% +

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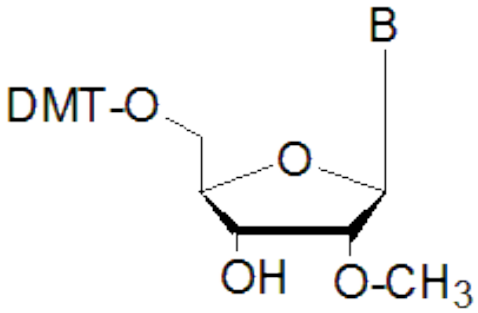


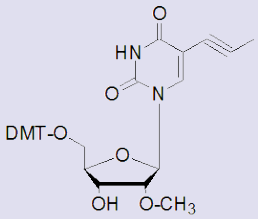
DMT Protected 2'-O-Methyl Nucleosides

5'	B	Protection	Catalog#
O-DMT	A	*N*-Bz	PM-5731
O-DMT	C	*N*-Bz	PM-5732
O-DMT	G	*N*-iBu	PM-5733
O-DMT	U	n/a	PM-5734
O-DMT	C	*N*-Ac	PM-5735
O-DMT	A	*N*-PAC	PM-3701
O-DMT	C	*N*-PAC	PM-3702
O-DMT	G	*N*-PAC	PM-3703

Catalog#	Productname	500mg	1gm
PM-5731	5'-*O*-DMT 2'-*O*-Methyl Adenosine (*N*-Bz) *M.W.687.74*	$180	$340
PM-5732	5'-*O*-DMT 2'-*O*-Methyl Cytidine (*N*-Bz) *M.W.683.72*	$150	$280
PM-5733	5'-*O*-DMT 2'-*O*-Methyl Guanosine (*N*-iBu) *M.W. 669.72*	$180	$340
PM-5734	5'-*O*-DMT 2'-*O*-Methyl Uridine *M.W. 580.59*	$150	$280
PM-5735	5'-*O*-DMT 2'-*O*-Methyl Cytidine (*N*-Ac) *M.W.601.65*	$180	$340
PM-3701	5'-*O*-DMT 2'-*O*-Methyl Adenosine (*N*-PAC) *M.W. 717.77*	$195	$355
PM-3702	5'-*O*-DMT 2'-*O*-Methyl Cytidine (*N*-PAC) *M.W. 693.74*	$165	$310
PM-3703	5'-*O*-DMT 2'-*O*-Methyl Guanosine (*N*-PAC) *M.W. 733.77*	$195	$355

Purity: Ultrapure products: Isomeric impurity undected by HPLC.

5'-DMT-5-Propynyl-2'-(O-Methyl) Uridine



$C_{34}H_{34}N_2O_8$
Mol. Wt.: 598.64

Catalog#

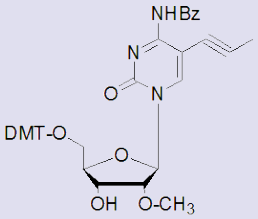
PM-1027

Pricing

$375.00 / 100 mg

Purity: 98% +
Isomeric impurity undected by HPLC.

5'-DMT-5-Propynyl-2'-(O-Methyl) Cytidine (*N-Bz*)



$C_{41}H_{39}N_3O_8$
Mol. Wt.: 701.76

Catalog#

PM-1129

Pricing

$1,300.00 / 100 mg

Purity: 98% +
Isomeric impurity undected by HPLC.

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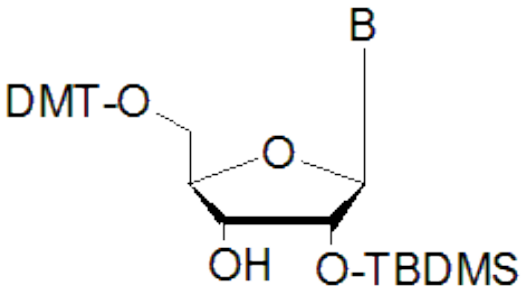

DMT Protected 2'-O-TBDMS Ribo Nucleosides

5'	B	Protection	Catalog#
O-DMT	A	*N*-Bz	PM-5851
O-DMT	C	*N*-Bz	PM-5852
O-DMT	G	*N*-iBu	PM-5853
O-DMT	U	n/a	PM-5854
O-DMT	I	n/a	PM-5855
O-DMT	C	*N*-Ac	PM-5856
O-DMT	C	*N,N*-diBz	PM-5857
O-DMT	A	*N*-PAC	PM-3501
O-DMT	C	*N*-PAC	PM-3502
O-DMT	G	*N*-PAC	PM-3503

Catalog#	Productname	1gm	5gm	10gm
PM-5851	5'-*O*-DMT 2'-*O*-TBDMS Adenosine (*N*-Bz) *M.W.787.97*	$75	$356	$675
PM-5852	5'-*O*-DMT 2'-*O*-TBDMS Cytidine (*N*-Bz) *M.W.783.95*	$75	$356	$675
PM-5853	5'-*O*-DMT 2'-*O*-TBDMS Guanosine (*N*-iBu) *M.W. 769.96*	$95	$555	$845
PM-5854	5'-*O*-DMT 2'-*O*-TBDMS Uridine *M.W. 660.83*	$75	$356	$675
PM-5855	5'-*O*-DMT 2'-*O*-TBDMS Inosine *M.W. 684.85*	$98	$451	$845
PM-5856	5'-*O*-DMT 2'-*O*-TBDMS Cytidine (*N*-Ac) *M.W.701.88*	$95	$555	$845
PM-5857	5'-*O*-DMT 2'-*O*-TBDMS Adenosine (*N,N*-diBz) *M.W. 892.08*	$95	$555	$845
PM-3501	5'-*O*-DMT 2'-*O*-TBDMS Adenosine (*N*-PAC) *M.W. 818.00*	$83	$380	$700
PM-3502	5'-*O*-DMT 2'-*O*-TBDMS Cytidine (*N*-PAC) *M.W. 793.98*	$83	$380	$700
PM-3503	5'-*O*-DMT 2'-*O*-TBDMS Guanosine (*N*-PAC) *M.W. 834.00*	$93	$388	$705

Purity: 0% Isomeric Impurity. These are Ultrapure Products.

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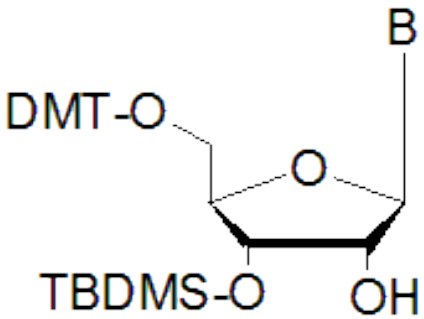


DMT Protected 3'-O-TBDMS Nucleosides

5'	B	Protection	Catalog#
O-DMT	A	*N*-Bz	PM-5861
O-DMT	C	*N*-Bz	PM-5862
O-DMT	G	*N*-iBu	PM-5863
O-DMT	U	n/a	PM-5864

Catalog#	Productname	1gm	5gm
PM-5861	5'-*O*-DMT 3'-*O*-TBDMS Adenosine (*N*-Bz) *M.W.787.97*	$ 90	$427
PM-5862	5'-*O*-DMT 3'-*O*-TBDMS Cytidine (*N*-Bz) *M.W.783.95*	$ 90	$427
PM-5863	5'-*O*-DMT 3'-*O*-TBDMS Guanosine (*N*-iBu) *M.W. 769.96*	$126	$577
PM-5864	5'-*O*-DMT3'-*O*-TBDMS Uridine *M.W. 660.83*	$ 90	$427

Purity: Ultrapure Products. Isomeric impurity undected by HPLC.

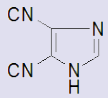
Activation Reagents

1,2,4-Triazole

$C_2H_3N_3$
Mol. Wt.: 69.07

Catalog#	Pricing
RN-1412	$ 17.00 / 25 gm
	$ 60.00 / 100 gm
	$240.00 / 500 gm

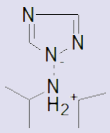
Dicyanoimidazole (DCI)



$C_5H_2N_4$
Mol. Wt.: 118.10

Catalog#	Pricing
RN-1571	$ 15.00 / 1 gm
	$ 65.00 / 5 gm
	$ 180.00 / 50 gm
	$ 320.00 / 100 gm
	$1,020.00 / 1 kg

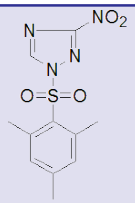
Diisopropyl Ammonium Tetrazolide



$C_8H_{18}N_4$
Mol. Wt.: 170.26

Catalog#	Pricing
RN-1413	$ 80.00 / 5 gm
	$ 240.00 / 50 gm
	$ 420.00 / 100 gm
	$1,050.00 / 1 kg

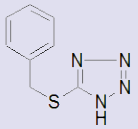
Mesitylene Sulphonyl-3-nitro-1,2,4-Triazole (MSNT)



$C_{11}H_{12}N_4O_4S$
Mol. Wt.: 296.30

Catalog#	Pricing
RN-1403	$ 36.00 / 1 gm
	$120.00 / 5 gm
	$198.00 / 10 gm

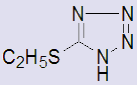
5-Benzylthio Tetrazole (BTT)



$C_8H_8N_4S$
Mol. Wt.: 192.24

Catalog#	Pricing
RN-1415	$ 18.00 / 1 gm
	$ 78.00 / 5 gm
	$ 216.00 / 50 gm
	$ 354.00 / 100 gm
	$1,020.00 / 1 kg

5-Ethylthio Tetrazole (ETT)



$C_3H_6N_4S$
Mol. Wt.: 130.17

Catalog#	Pricing
RN-6397	$ 18.00 / 1 gm
	$ 78.00 / 5 gm
	$ 216.00 / 50 gm
	$ 354.00 / 100 gm
	$1,020.00 / 1 kg

Bulk Quantity Available:

Bulk quantity of Ultra Pure 5'-benzylthio tetrazole & 5-Ethylthio tetrazole are available in 10 kg , 50 kg & 100 kg size.
Please enquire pricing.

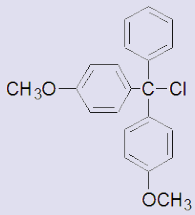
5-Ethylthio-Tetrazole in RNA Synthesis

5-ethylthio-tetrazole has been demonstrated to be a superior coupling reagent for oligoribonucleotide synthesis. This reagent increases the stepwise coupling efficiency by 2-3% as compared to the conventional activator 1-H Tetrazole *(B. Sproat, F. Colonna, B. Mullah, D. Tsou, A. Andrus, A. Hampel, R. Vinayak, Nucleosides & Nucleotides, 14, 255, 1995)*. The total oligonucleotide yield and quality have been shown to increase dramatically when using 5-ethylthio-tetrazole. Perhaps the greater acidity and stability of 5-ethylhio-tetrazole accounts for its superior performance. This reagent is especially suitable for large scale oligoribonucleotide synthesis.

Damha et. al. have utilized this reagent in RNA synthesis of natural linkage (3', 5') and unnatural linkage (2', 5') and observed coupling efficiencies > 99% and a 7.5 minute coupling time. *(Marita Wasner, Dominique Ariohn, Gadi Borkow, Anne Noronha, Andre Uddin, Michael Parniak and Masad Damha, Biochemistry, 37, 7478-7486 1998)*.

Bulk Production: Beaucage Reagents & DMT Chlorides

DMT-Chloride



$C_{21}H_{19}ClO_2$
Mol. Wt.: 338.83

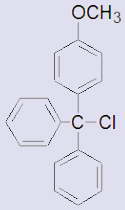
Catalog#

RN-1401

Pricing

$ 15.00 / 5 gm
$ 50.00 / 25 gm
$165.00 / 100 gm
$650.00 / 1 kg

MMT-Chloride



$C_{20}H_{17}ClO$
Mol. Wt.: 308.80

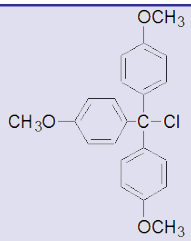
Catalog#

RN-1574

Pricing

$ 18.00 / 5 gm
$ 55.00 / 25 gm
$195.00 / 100 gm
$850.00 / 1 Kg

TMT-Chloride



$C_{22}H_{21}ClO_3$
Mol. Wt.: 368.85

Catalog#

RN-1491

Pricing

$ 45.00 / 5 gm
$195.00 / 25 gm

Bulk Quantity Available:

Bulk quantity of Ultra Pure DMT-Chloride available in 5 kg, 10 kg, 50 kg & 100 kg size.
Please enquire pricing.

DMT Chloride: Typical Lot Analysis

Elemental Analysis:	Chlorine analysis results within 1 gm/mole of the theoretical value and < 0.4gm variation per 100gm. Theoretical Chlorine Value: 35.44 gm/mole Observed Chlorine Value: 36.42 gm/mole
Color:	Off-white to faint pink, produces colorless DMT-nucleosides.
Application:	Protecting agent in polynucleotide synthesis.
Reactivity:	1.2 equivalent reacts to produce colorless DMT-deoxynucleosides quantitatively.

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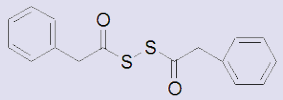
Sulfurizing Reagent

Phenylacetyl Disulfide (PADS)



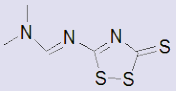
$C_{16}H_{14}O_2S_2$
Mol. Wt.: 302.41

Catalog#	Pricing
RN-1496	$26.50 / 5 gm
	$108.00 / 25 gm

Silanized Bottle (for Beaucage Reagent)

Catalog#	Pricing
BL-1536	$8.00 / 100 ml
	$8.00 / 250 ml
	$8.00 / 500 ml

DDTT((Dimethylamino-methylidene)amino)-3H-1,2,4-dithiazoline-3-thione / Sulfurizing Reagent *



$C_5H_7N_3S_3$
Mol. Wt.: 205.33

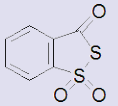
Catalog#

RN-1588

Pricing

$ 30.00 / 1 gm
$ 150.00 / 5 gm
$ 550.00 / 25 gm
$1800.00 / 100 gm
1 kg / Please inquire

3h-1,2-Benzodithiole-3-One-1,1-dioxide Sulfurizing Reagent/ Sulfurizing Reagent (Beaucage Reagent)



$C_7H_4O_3S_2$
Mol. Wt.: 200.24

Catalog#

RN-1535

Pricing

$15.00 / 100 mg
$50.00 / 1 gm
$90.00 / 2 gm

DDTT((Dimethylamino-methylidene)amino)-3H-1,2,4-dithiazoline-3-thione/Sulfurizing Reagent 5-ethylthio-tetrazole has been A number of 1,2,4-dithiazolines have been described in literature[1-2] and demonstrated high sulfurizing efficiency in oligonucleotide synthesis. ChemGenes is now offering an efficient sulfurizing reagent, DDTT [3] with quantitative (greater than 99%) P/S conversion in oligonucleotide synthesis as compared to Beaucage reagent and other sulfurizing reagents and has further advantage of greater stability in the formulated solutions (upto six months).Recommended formulations are summarized in the table below (Table 1)

Table1. Recommended formulations for the synthesis of phosphorothioate containing oligonucleotides (DNA & RNA) and sulfurising in solution phase.

DDTT Concentration	Solvent formulation v/v	Oxidation time (DNA)	Comments****
0.05 M	Py/ACN – 3:7 Py/THF – 2:8	2.5 min	Formulation used in solid phase deoxy oligonucleotide (DNA) synthesis
0.1 M	Py Py/THF** – 4:6	2.0 min	Formulation used in solid phase deoxy oligonucleotide (DNA)synthesis
0.05 M	Pyr/ACN -4:6	2.0 min	Formulation used in solution phase deoxy oligonucleotide synthesis
0.05 M	Py/ ACN-3:7	Oxidation time (RNA) 4.0 min	Formulation used in solid phase RNA synthesis
0. 1 M	Py/ACN-3:7	3 min	Formulation used in solid phase RNA synthesis

*** For use of THF, care must be taken to ensure peroxide free THF only.
**** (>99%) to P-S and negligible amount of P-O formation occurred, as analyzed by 31 P NMR.

1.References: 1. Xu, Q., Musier-Forsyth, K., Hammer R. P. and Barany G. *Nucleic Acid Research*, **1996**, *24*, 1602-1607.
2.Xu, Q., Barany G., Hammer R. P. and Musier-Forsyth, K. *Nucleic Acid Research*, **1996**, *24*, 3643-3645.
3. Patent Pending, AM Chemicals, LLC

* DDTT Sulfurizing solutions are listed on Ancillary Reagents Section, Page No. 17-23

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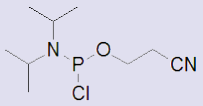
Phosphorylating Reagents

Dichloromethoxy phosphite

CH_3Cl_2OP
Mol. Wt.: 132.91

Catalog#	Pricing
RN-1407	$18.00 / 1 gm
	$84.00 / 5 gm

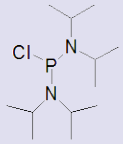
N,N-Diisopropylamino Cyanoethyl phosphonamidic-chloride



$C_9H_{18}ClN_2OP$
Mol. Wt.: 236.68

Catalog#	Pricing
RN-1505	$ 13.50 / 1 gm
	$ 55.50 / 5 gm
	$250.00 / 25 gm
	$700.00 / 100 gm

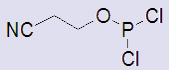
Bis (diisopropylamino) chlorophosphine



$C_{12}H_{28}ClN_2P$
Mol. Wt.: 266.79

Catalog#	Pricing
RN-8882	$15.00 / 1 gm
	$70.00 / 5 gm
	$900.00 / 100 gm

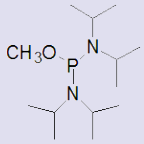
Cyanoethyl dichlorophosphite



$C_3H_4Cl_2NOP$
Mol. Wt.: 171.95

Catalog#	Pricing
RN-8883	$16.00 / 1 gm
	$75.00 / 5 gm

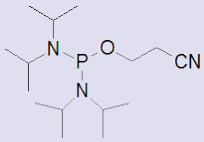
Methoxy N,N,N,N-tetraisopropylphosphane



$C_{13}H_{31}N_2OP$
Mol. Wt.: 262.37

Catalog#	Pricing
RN-8881	$20.00 / 1 gm
	$95.00 / 5 gm

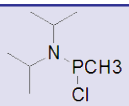
2-Cyanoethyl N,N,N,N-teraisopropyl phosphane



$C_{15}H_{32}N_3OP$
Mol. Wt.: 301.41

Catalog#	Pricing
RN-1545	$ 12.00 / 1 gm
	$ 40.00 / 5 gm
	$550.00 / 100 gm

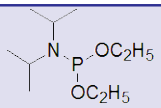
N,N-Diisopropylamino methyl phosphonamidic-chloride



$C_7H_{17}ClNP$
Mol. Wt.: 181.64

Catalog#	Pricing
RN-1510	$135.00 / 5 gm
	$980.00 / 50 gm

Diethoxy N,N-Diisopropyl phosphoramidite



$C_{10}H_{24}NO_2P$
Mol. Wt.: 221.28

Catalog#	Pricing
RN-1410	$90.00 / 5 gm

Diethoxy N,N-Diisopropylphosphoramidite: A stable capping Reagent

This reagent is utilized for capping directly during oligodeoxy-nucleotide synthesis by phosphoramidite method and avoids preparation of the commonly used, and rather unstable, Diethylphosphotriazolide capping reagent.

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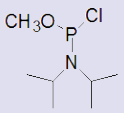
Phosphorylating Reagents

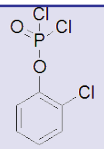
N,N-Diisopropyl methoxy phosphonamidic-Cl



$C_7H_{17}ClNOP$
Mol. Wt.: 197.64

Catalog#	Pricing
RN-1409	$ 17.00 / 1 gm
	$60.00 / 5 gm
	$264.00 / 25 gm
	$816.00 / 100 gm

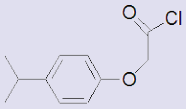
O-Chlorophenyl phosphorodichloridate



$C_6H_4Cl_3O_2P$
Mol. Wt.: 245.43

Catalog#	Pricing
RN-1421	$30.00 / 5 gm
	$91.00 / 25 gm

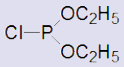
4-Isopropyl Phenoxy Acetyl Chloride



$C_{11}H_{13}ClO_2$
Mol. Wt.: 212.67

Catalog#	Pricing
RN-1705	$15.00 / 1 gm
	$70.00 / 5 gm

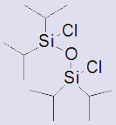
Diethyl phosphorochloride



$C_4H_{10}ClO_2P$
Mol. Wt.: 156.55

Catalog#	Pricing
RN-1408	$30.00 / 5 gm
	$99.00 / 25 gm

Bis-Silyating Reagent



$C_{12}H_{28}Cl_2OSi_2$
Mol. Wt.: 315.43

Catalog#	Pricing
RN-1521	$ 72.00 / 1 gm
	$132.00 / 5 gm
	$420.00 / 50 gm

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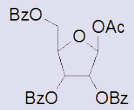
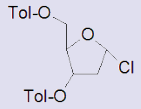
2,3,5-O-Tribenzoyl-D-Ribofuranosyl-1-Acetate



$C_{28}H_{24}O_9$
Mol. Wt.: 504.48

Catalog#	Pricing
RN-4131	$ 44.00 / 5 gm
	$150.00 / 25 gm

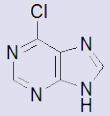
1-alpha-chloro-3,5-ditoluoyl-2-deoxy-D-ribose



$C_{21}H_{21}O_5$
Mol. Wt.: 388.84

Catalog#	Pricing
RN-4130	$ 45.00 / 1 gm
	$200.00 / 5 gm

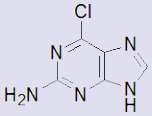
6-Chloro Purine



$C_5H_3ClN_4$
Mol. Wt.: 154.56

Catalog#	Pricing
RN-1030	$20.00 / 1 gm
	$80.00 / 5 gm

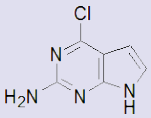
6-Chloro Guanine



$C_5H_4ClN_5$
Mol. Wt.: 169.57

Catalog#	Pricing
RN-1051	$ 40.00 / 1 gm
	$190.00 / 5 gm

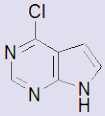
6-Chloro-7-deaza Guanine



$C_6H_5ClN_4$
Mol. Wt.: 168.58

Catalog#
BS-1011
Pricing
$138.00 / 1 gm
Purity: 98% +

6-Chloro-7-deaza Purine



$C_6H_4ClN_3$
Mol. Wt.: 153.57

Catalog#
RP-1021
Pricing
$138.00 / 1 gm
Purity: 98% +

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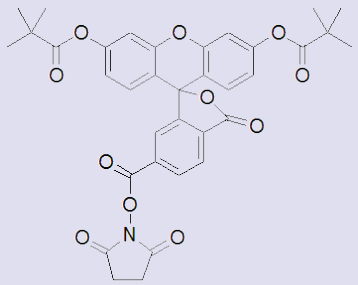
5 & 6 Fluoresceins

6-Fluorescein Dipivalate NHS Ester
(6-FAM Dipivalate NHS Ester)



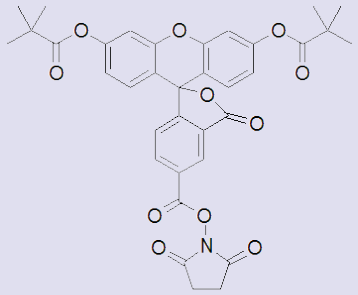
$C_{35}H_{31}NO_{11}$
Mol. Wt.: 641.62

Catalog# RN-9651

Pricing
$ 67.00 / 10 mg
$ 303.75 / 50 mg
$ 545.00 / 100 mg

Purity: 98% +

5-Fluorescein Dipivalate NHS Ester
(5-FAM Dipivalate NHS Ester)



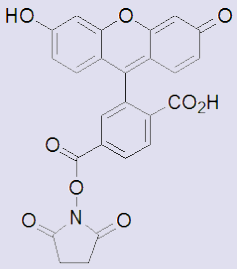
$C_{35}H_{31}NO_{11}$
Mol. Wt.: 641.62

Catalog# RN-9652

Pricing
$ 74.25 / 10 mg
$334.00 / 50 mg
$601.00 / 100 mg

Purity: 98% +

6-Fluorescein NHS Ester
(6-FAM NHS Ester)



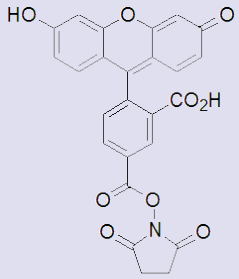
$C_{25}H_{15}NO_9$
Mol. Wt.: 473.39

Catalog# RN-9661

Pricing
$ 22.00 / 10 mg
$ 144.00 / 100 mg
$1,296.00 / 1 gm

Purity: 98% +

5-Fluorescein NHS Ester
(5-FAM NHS Ester)



$C_{25}H_{15}NO_9$
Mol. Wt.: 473.39

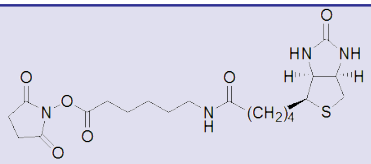
Catalog# RN-9662

Pricing
$ 24.75 / 10 mg
$ 178.50 / 100 mg
$1,606.00 / 1 gm

Purity: 98% +

Biotin

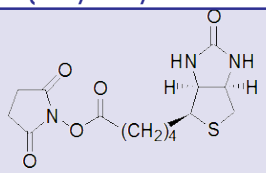
Biotin-Amido Caproate-N-Hydroxy



$C_{20}H_{30}N_4O_6S$
Mol. Wt.: 454.54

Catalog#	Pricing
RN-1449	$12.00 / 25 mg
	$42.00 / 100 mg

Biotin Ester (N-Hydroxysuccinimide)



$C_{14}H_{19}N_3O_5S$
Mol. Wt.: 341.38

Catalog#	Pricing
RN-1500	$30.00 / 100 mg

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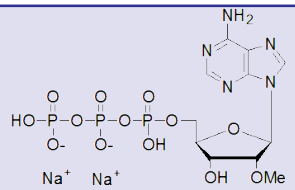
2'-(O-Methyl) Adenosine 5'-triphosphate disodium salt

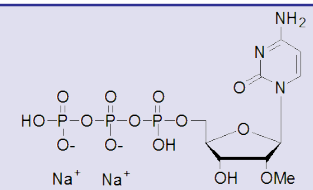


$C_{11}H_{16}N_5Na_2O_{13}P_3$
Mol. Wt.: 565.17

Catalog#	Pricing
NTP-3386	$ 71.50 / 1 mg (1 µmole = 0.57 mg)
	$126.50 / 2 mg (2 µmole = 1.30 mg)
	$308.00 / 5 mg (5 µmole = 2.83 mg)

Purity: 98% +

2'-(O-Methyl) Cytidine 5'-triphosphate disodium salt

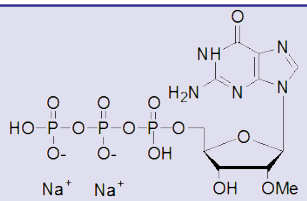


$C_{10}H_{16}N_3Na_2O_{14}P_3$
Mol. Wt.: 541.15

Catalog#	Pricing
NTP-3387	$ 71.50 / 1 mg (1 µmole = 0.54 mg)
	$126.50 / 2 mg (2 µmole = 1.08 mg)
	$308.00 / 5 mg (5 µmole = 2.71 mg)

Purity: 98% +

2'-(O-Methyl) Guanosine 5'-triphosphate disodium salt

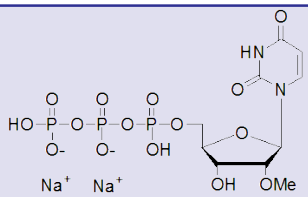


$C_{11}H_{16}N_5Na_2O_{14}P_3$
Mol. Wt.: 581.17

Catalog#	Pricing
NTP-3388	$ 71.50 / 1 mg (1 µmole = 0.58 mg)
	$126.50 / 2 mg (2 µmole = 1.16 mg)
	$308.00 / 5 mg (5 µmole = 2.90 mg)

Purity: 98% +

2'-(O-Methyl) Uridine 5'-triphosphate disodium salt

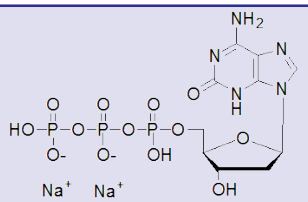


$C_{10}H_{15}N_2Na_2O_{15}P_3$
Mol. Wt.: 542.13

Catalog#	Pricing
NTP-3389	$ 71.50 / 1 mg (1 µmole = 0.54 mg)
	$126.50 / 2 mg (2 µmole = 1.08 mg)
	$308.00 / 5 mg (5 µmole = 2.71 mg)

Purity: 98% +

deoxy Isoguanosine 5'-triphosphate disodium salt



$C_{10}H_{14}N_5Na_2O_{13}P_3$
Mol. Wt.: 551.14

Catalog#	Pricing
NTP-4396	$165.00 / 1 mg (1 µmole = 0.55 mg)
	$280.00 / 2 mg (2 µmole = 1.10 mg)
	$650.00 / 5 mg (5 µmole = 2.76 mg)

Purity: 98% +

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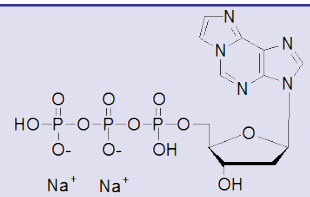
Etheno deoxy Adenosine 5'-triphosphate disodium salt

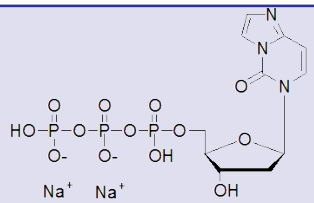


$C_{12}H_{14}N_5Na_2O_{12}P_3$
Mol. Wt.: 559.17

Catalog#	Pricing
NTP-4344	$165.00 / 1 mg (1 µmole = 0.56 mg)
	$310.00 / 2 mg (2 µmole = 1.12 mg)
	$645.00 / 5 mg (5 µmole = 2.80 mg)

Purity: 98% +

Etheno deoxy Cytidine 5'-triphosphate disodium salt

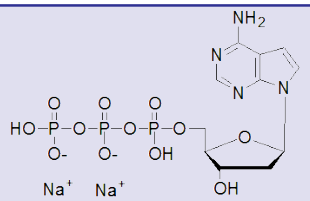


$C_{11}H_{14}N_3Na_2O_{13}P_3$
Mol. Wt.: 535.14

Catalog#	Pricing
NTP-4346	$165.00 / 1 mg (1 µmole = 0.54 mg)
	$310.00 / 2 mg (2 µmole = 1.07 mg)
	$645.00 / 5 mg (5 µmole = 2.68 mg)

Purity: 98% +

7-deaza deoxy Adenosine 5'-triphosphate disodium salt

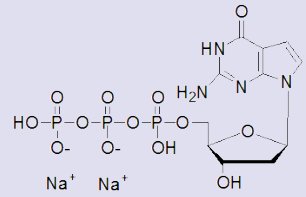


$C_{11}H_{15}N_4Na_2O_{12}P_3$
Mol. Wt.: 534.16

Catalog#	Pricing
NTP-4384	$153.00 / 1 mg (1 µmole = 0.53 mg)
	$275.00 / 2 mg (2 µmole = 1.07 mg)
	$650.00 / 5 mg (5 µmole = 2.67 mg)

Purity: 98% +

7-deaza deoxy Guanosine 5'-triphosphate disodium salt

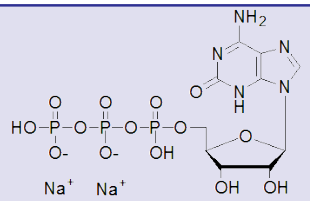


$C_{11}H_{15}N_4Na_2O_{13}P_3$
Mol. Wt.: 550.16

Catalog#	Pricing
NTP-4386	$153.00 / 1 mg (1 µmole = 0.55 mg)
	$275.00 / 2 mg (2 µmole = 1.10 mg)
	$650.00 / 5 mg (5 µmole = 2.75 mg)

Purity: 98% +

isoguanosine 5'-triphosphate disodium salt



$C_{10}H_{14}N_5Na_2O_{14}P_3$
Mol. Wt.: 567.14

Catalog#	Pricing
NTP-4348	$165.00 / 1 mg (1 µmole = 0.57 mg)
	$280.00 / 2 mg (2 µmole = 1.13 mg)
	$680.00 / 5 mg (5 µmole = 2.84 mg)

Purity: 98% +

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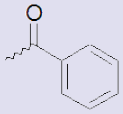
Common Abbreviations

Acetyl

C_2H_3O
Mol. Wt.: 43.04

Bz Benzoyl

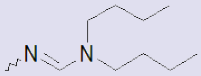


C_7H_5O
Mol. Wt.: 105.11

CE Cyanoethyl

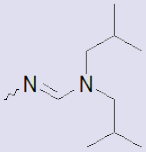
C_3H_4N
Mol. Wt.: 54.07

DBF
Di-N-butylformamidine



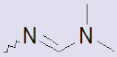
$C_{10}H_{20}N$
Mol. Wt.: 154.47

DIBF
diisobutylryldimethylformidine



$C_{10}H_{20}N$
Mol. Wt.: 154.47

DMF
Dimethylformamidine

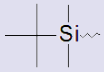


C_3H_7N
Mol. Wt.: 57.09

iBu
isobutylryl

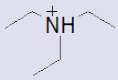
C_4H_7O
Mol. Wt.: 71.10

O-TBDMS
tertbutyldimethylsilyl



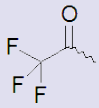
$C_6H_{15}Si$
Mol. Wt.: 115.27

TEA
triethylammonium



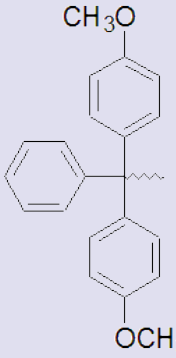
$C_6H_{15}N$
Mol. Wt.: 101.19

TFA
Trifluoracetyl



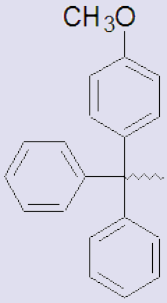
C_2F_3O
Mol. Wt.: 97.02

DMT
Dimethoxytrityl



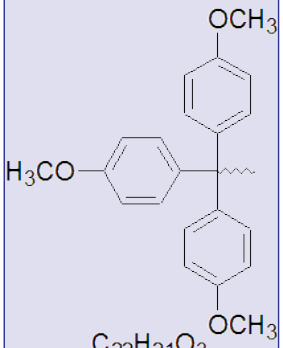
$C_{21}H_{19}O_2$
Mol. Wt.: 303.38

MMT
Monoimethoxytrityl



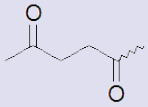
$C_{20}H_{17}O$
Mol. Wt.: 273.35

TMT
Trimethoxytrityl



$C_{22}H_{21}O_3$
Mol. Wt.: 333.40

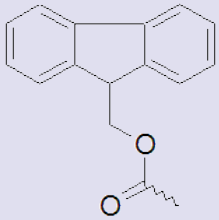
Levulinyl



$C_5H_7O_2$
Mol. Wt.: 99.11

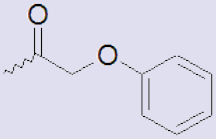
THF-tetrahydrofuran
lcaa= long chain allkylamino
CPG=Control Pore Glass
AMA=ammonium methyl amine(aq)

Fmoc
Fluorenylmethoxycarbonyl



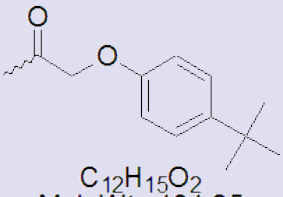
$C_{15}H_{11}O_2$
Mol. Wt.: 223.25

PAC
Phenoxyacetyl



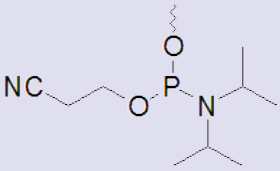
$C_8H_7O_2$
Mol. Wt.: 135.14

tBPAC
tert-butylphenoxyacetyl



$C_{12}H_{15}O_2$
Mol. Wt.: 191.25

CEP
O-Cyanoethyl-N,N-diisopropyl
Phosphoramidite



$C_9H_{18}N_2OP$
Mol. Wt.: 201.16

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#
2'-5'-Linkage RNAAmidites: 60
A
Abasic Amidites: 40
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5'-DMT 2'-(O-Methyl) Adenosine (*N-PAC*) mononucleoside: 140
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5'-DMT-2'-O-TBDMS Adenosine (n,n-dibz) mononucleoside: 141
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5-Iodo-deoxy Uridine 3'-succinyl Icaa CPG: 32
5-Iodo-deoxy Uridine CEP phoshoramidite: 32
5-Iodo-deoxy Uridine: 118
5-Iodo-ribo Uridine: 124
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Beta-L-3'-O-TBDMS Uridine 2'-succinyl Icaa CPG: 72
Beta-L-deoxy Uridine: 120
Beta-L-ribo Uridine: 126
5-Methyl-2'-(O-Methyl) Uridine Amidite & CPG: 101, 102
3'-DMT-5-Methyl-2'-(O-Methyl) Uridine 5'-Amidite & CPG: 114, 115
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5-Propynyl-2'-O-Methyl Uridine mononucleoside: 128
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5'-DMT 5-Propynyl deoxy Uridine mononucleoside: 137
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3'-(O-allyl) Uridine: 129
3'-(O-Methyl) Uridine mononucleoside: 128
3'-O-Propargyl Uridine mononucleoside: 130
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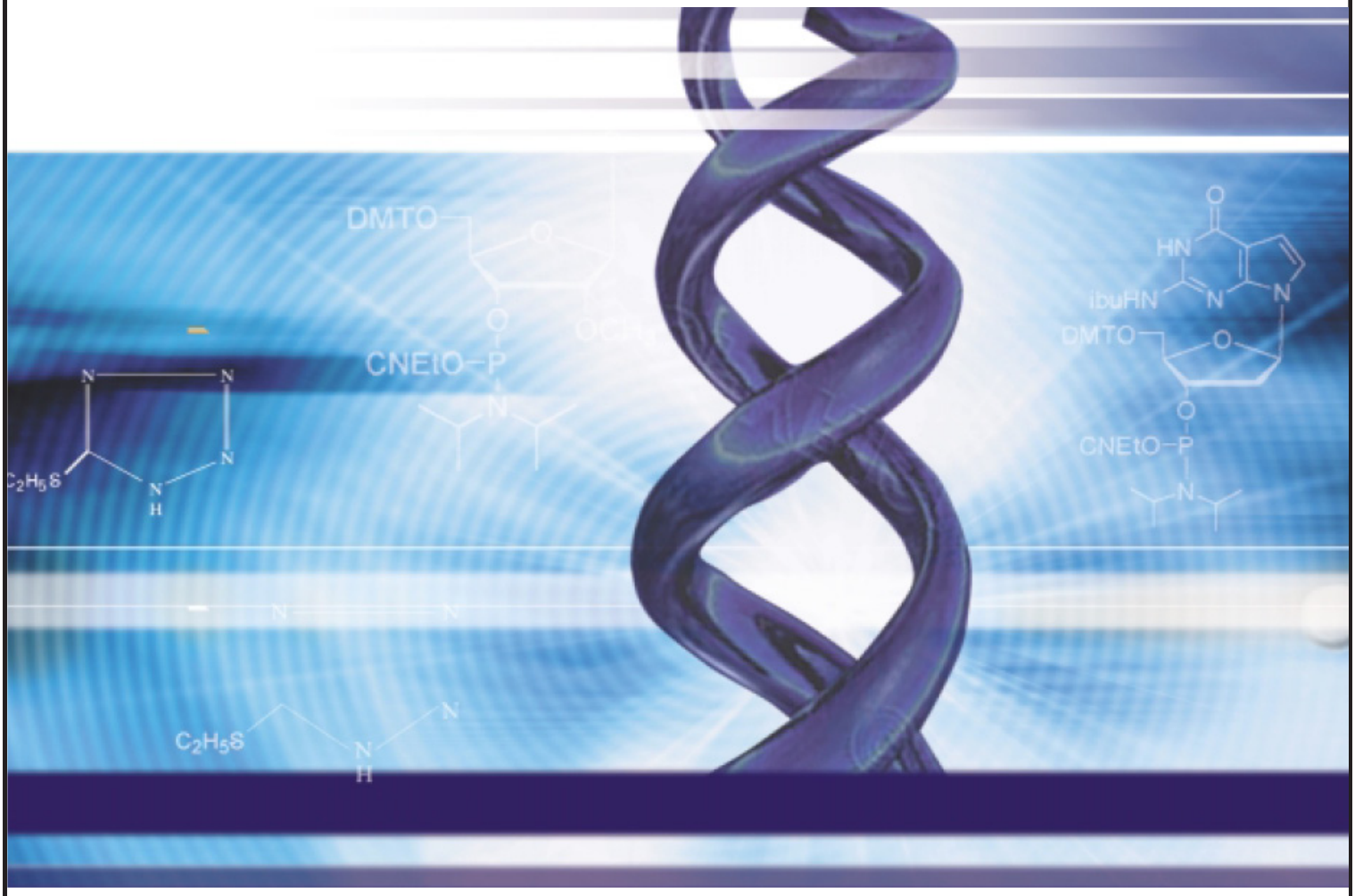

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