

E-Catalog Version 6.0

Release Date: 10-12-2009



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 Oxaryl CPGs
- DNA Purification kit
- RNA Purification kit



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www.chemgenes.com

Email: info@chemgenes.com

ChemGenes Exhibit 2012 - New Products



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

β -L-DNA & β -L-RNA

7-Deaza Products

Deoxy & Ribo Nucleosides, protected

Dimers

Triphosphates

Ancillary Reagents for Oligonucleotide Synthesis

and much more...

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ChemGenes Corporation

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-thio-ethyltetrazole, 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

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, Acadia, 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

Tools for Molecular Biology Research

Oligo Synthesis Reagents

Natural DNA Amidites & Supports

Standard Protection	2-4
Mild Deprotection	5-6
Fast Deprotection (using AMA Reagent)	7
p-methoxy Amidites	8
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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

v



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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.

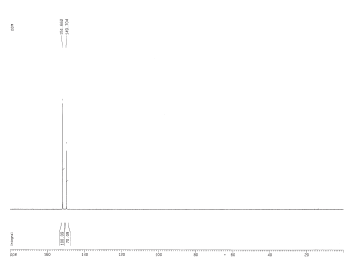
Oligo Synthesis Products

Phosphoramidites and Supports for Natural DNA Synthesis

Quality Control Criteria for UltraPure DNA Phosphoramidites

^{31}P NMR

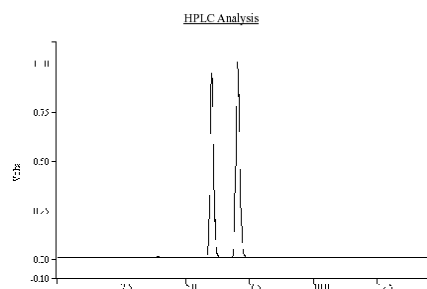
- Single or double peak
- Detection Limit: 0.08%



^{31}P NMR of a DNA Phosphoramidite

HPLC

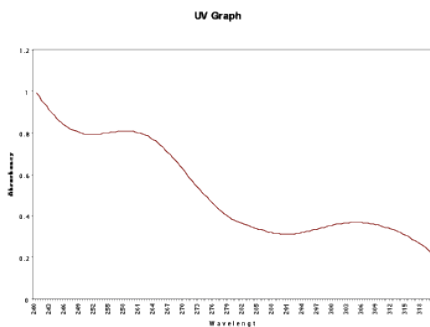
- Single or double peak
- Detection limit: 0.2%



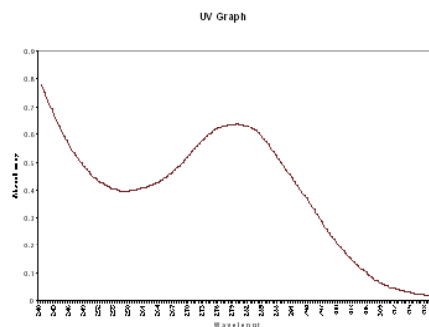
HPLC Graph of deoxy Guanosine (N-iBu) CEP

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

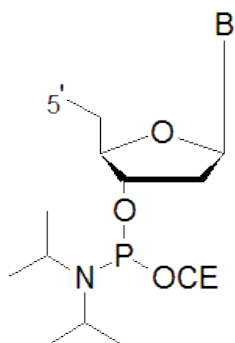
Solubility Test

- 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.

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, <i>M.W. 857.92</i>	\$11	\$22	\$40	\$65	\$145	\$270	\$ 750
ANP-5552	deoxy Cytidine (N-Bz) 3'-CEP, <i>M.W. 833.89</i>	\$11	\$22	\$40	\$65	\$145	\$270	\$ 750
ANP-5553	deoxy Guanosine (N-iBu) 3'-CEP, <i>M.W. 839.90</i>	\$11	\$22	\$40	\$65	\$145	\$270	\$ 750
ANP-5554	Thymidine CEP, <i>M.W. 744.80</i>	\$11	\$22	\$40	\$65	\$145	\$270	\$ 750
ANP-5559	deoxy Cytidine (N-iBu) 3'-CEP, <i>M.W. 799.89</i>	\$14	\$26	\$40	\$65	\$145	\$270	\$ 750
ANP-5560	deoxy Cytidine (N-Ac) 3'-CEP, <i>M.W. 771.84</i>	\$14	\$26	\$40	\$65	\$145	\$270	\$ 750
ANP-5556	MMT-deoxy Adenosine (N-Bz) 3'-CEP, <i>M.W. 827.91</i>	\$15	\$28	\$54	\$95	\$210	\$375	\$1,010
ANP-5557	MMT-deoxy Guanosine (N-iBu) 3'-CEP, <i>M.W. 809.89</i>	\$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.

Oligo Synthesis Products

Phosphoramidites and Supports for Natural DNA Synthesis

Solid Supports & Columns

CPG's have a C-17 spacer (Icaa) between the succinate and Silyl group on the CPG supports. The long chain spacer arm is $\approx 18 \text{ \AA}$ 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.

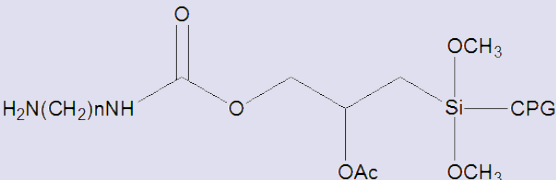
Amino CPG Long Chain Alkyl (Icaa) Support

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 Icaa CPG Supports for optimum oligo chain length

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

Amino Icaa 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: 500$\text{\AA}$		Pore Size: 1000$\text{\AA}$	

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

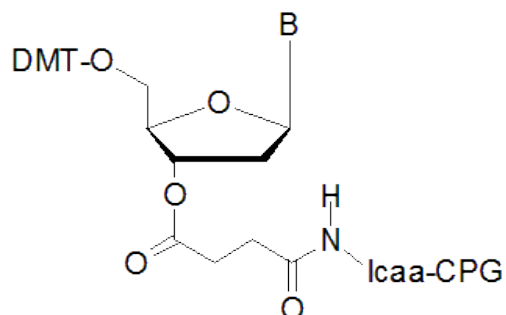
Empty Columns

Catalog#	Product Name	Synthesizer	0.2 μm	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

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

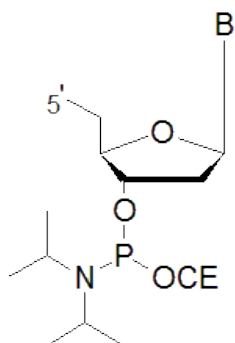
Catalog #	Product Name	Pore Size	Bulk CPG			pack of 4 cols.			each		pack of 10 cols.		
			100 mg	1 gm	5 gm	40 nmole	0.2 μmole	1.0 μmole	10 μmole	15 μmole	40 nmole	0.2 μmole	1.0 μmole
N-5101-05	deoxy Adenosine	500Å											
N-5101-10	(N-Bz) 3'-Icaa CPG	1000Å	\$8	\$65	\$280	\$26	\$32	\$40	\$85	\$120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

Please Indicate Synthesizer when Ordering_____

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

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, <i>M.W. 887.96</i>	\$22	\$40	\$65	\$135	\$210	\$375
ANP-6565 NEW!	deoxy Adenosine (N6-dimethylacetamidine) 3'-CEP, <i>M.W. 887.96</i>	\$22	\$40	\$65	\$115	\$210	\$375
ANP-6662	deoxy Cytidine (N-PAC) 3'-CEP, <i>M.W. 863.93</i>	\$22	\$40	\$65	\$135	\$210	\$375
ANP-5668	deoxy Guanosine (n-tBPAC) 3'-CEP, <i>M.W. 960.06</i>	\$22	\$40	\$65	\$135	\$210	\$375
ANP-5554	Thymidine 3'-CEP, <i>M.W. 960.06</i>	\$11	\$21	\$40	\$65	\$145	\$270
ANP-6769	deoxy Guanosine (N,N-DMF) 3'-CEP, <i>M.W. 824.90</i>	\$22	\$40	\$65	\$135	\$210	\$375
ANP-5116	MMT-deoxy Adenosine (N-PAC) 3'-CEP, <i>M.W. 857.93</i>	\$25	\$48	\$72	\$115	\$230	\$410
ANP-5117	MMT-deoxy Guanosine (n-tBPAC) 3'-CEP, <i>M.W. 930.04</i>	\$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.

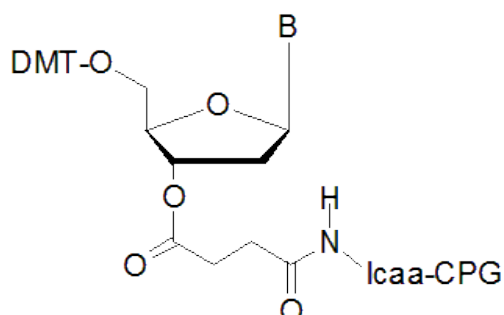
The capping reagent phenoxy acetic anhydride is available for capping during oligonucleotide synthesis, please see pages 17-23.

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

Please Indicate Synthesizer when Ordering

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

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

Catalog #	Product Name	Pore Size	Bulk CPG			pack of 4 cols.			each		pack of 10 cols.		
			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											

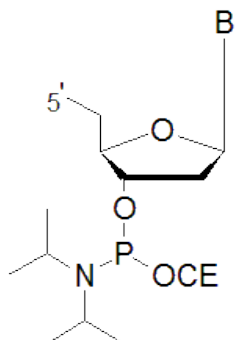
Please refer to deprotection conditions on previous page

Please Indicate Synthesizer when Ordering

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

Oligo Synthesis Products

Phosphoramidites and Supports for Natural DNA Synthesis



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

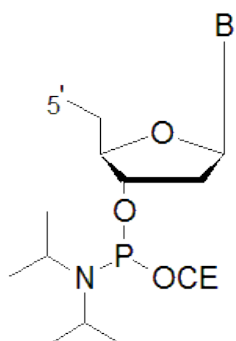
Catalog #	Product name	250mg	500mg	1gm	2gm	5gm	10gm
ANP-6661	deoxy Adenosine (N-PAC) 3'-CEP, <i>M.W. 887.96</i>	\$22	\$40	\$65	\$105	\$210	\$375
ANP-5560	deoxy Cytidine (N-Ac) 3'-CEP, <i>M.W. 771.84</i>	\$22	\$40	\$65	\$105	\$210	\$375
ANP-5668	deoxy Guanosine (n-tBPAC) 3'-CEP, <i>M.W. 960.06</i>	\$22	\$40	\$65	\$105	\$210	\$375
ANP-5554	Thymidine 3'-CEP, <i>M.W. 744.81</i>	\$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 Phosphoramidites are available at ChemGenes and are listed on pages 17-23.



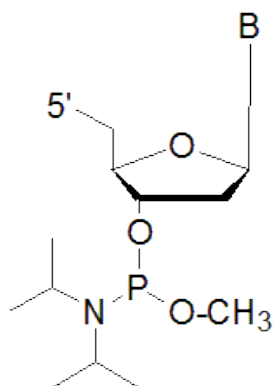
Base Unprotected Phosphoramidites for DNA Synthesis

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, <i>M.W. 753.83</i>	\$55	\$100	\$195	\$380
ANP-7772 NEW!	2'-deoxy Cytidine 5'-DMT 3'-CEP, <i>M.W. 729.80</i>	\$55	\$100	\$195	\$380
ANP-7773 NEW!	2'-deoxy Guanosine 5'-DMT 3'-CEP, <i>M.W. 769.83</i>	\$55	\$100	\$195	\$380

Phosphoramidites and Supports for Natural DNA Synthesis



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

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

Catalog #	Product Name	250mg	500mg	1gm	2gm	5gm
ANP-3761	deoxy Adenosine (<i>N</i> -Bz) 3'- <i>P</i> -methoxy phosphoramidite, <i>M.W.</i> 818.90	\$20	\$40	\$75	\$145	\$350
ANP-3762	deoxy Cytidine (<i>N</i> -Bz) 3'- <i>P</i> -methoxy phosphoramidite, <i>M.W.</i> 794.87	\$20	\$40	\$75	\$145	\$350
ANP-3763	deoxy Guanosine (<i>N</i> -iBu) 3'- <i>P</i> -methoxy phosphoramidite, <i>M.W.</i> 800.88	\$20	\$40	\$75	\$145	\$350
ANP-3768 NEW!	deoxy Guanosine (<i>N,N</i> -dimethylacetamidine) 3'- <i>P</i> -methoxy phosphoramidite, <i>M.W.</i> 738.90	\$30	\$50	\$85	\$155	\$360
ANP-3764	Thymidine 3'- <i>P</i> -methoxy phosphoramidite, <i>M.W.</i> 705.78	\$20	\$40	\$75	\$145	\$350
ANP-3766	MMT-deoxy Adenosine (<i>N</i> -Bz) 3'- <i>P</i> -methoxy phosphoramidite, <i>M.W.</i> 788.87	\$25	\$45	\$80	\$155	\$365
ANP-3767	MMT-deoxy Guanosine (<i>N</i> -iBu) 3'- <i>P</i> -methoxy phosphoramidite, <i>M.W.</i> 770.85	\$25	\$45	\$80	\$155	\$365

Important : Deprotection Conditions

- For natural phosphodiester: 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 phosphodiester oligonucleotides: use PAC protected *P*-methoxy phosphodiester listed on page #101 in combination with our ammonia free deprotection solution listed on page #98.

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

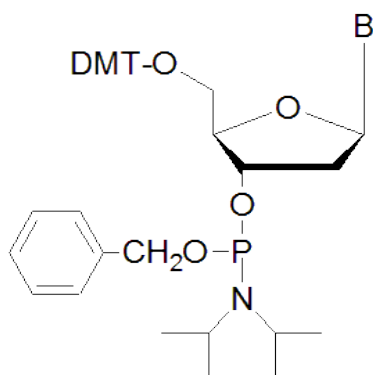
For a description of the advantages of using MMT nucleoside phosphoramidites, please see page #2.

Please Indicate Synthesizer when Ordering

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

Oligo Synthesis Products

Phosphoramidites and Supports for Natural DNA Synthesis



P-O-benzyl Phosphoramidites

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

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

Applications for *P*-O-benzyl phosphoramidite:

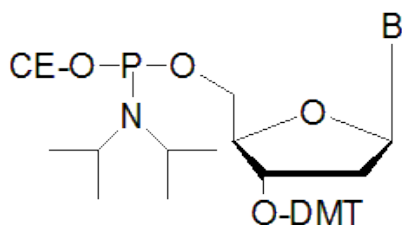
- Synthesis of Natural DNA fragments.
- Cleavage of *P*-O-benzyl phosphate occurs smoothly with aqueous ammonia.
- The synthesis of sequence specific phosphoramidites.

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

Please Indicate Synthesizer when Ordering

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

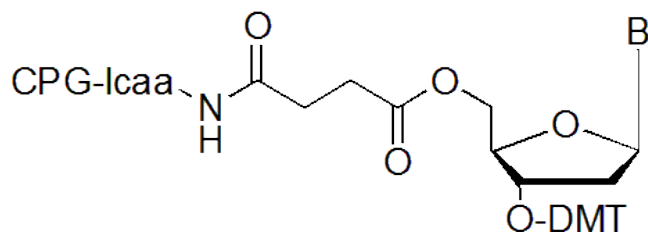
Phosphoramidites and Supports for Natural DNA Synthesis



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, <i>M.W. 857.92</i>	\$55	\$100	\$195	\$380
ANP-4672	deoxy Cytidine (N-Bz) 5'-CEP, <i>M.W. 833.89</i>	\$55	\$100	\$195	\$380
ANP-4673	deoxy Guanosine (N-iBu) 5'-CEP, <i>M.W. 839.90</i>	\$55	\$100	\$195	\$380
ANP-4674	Thymidine 5'-CEP, <i>M.W. 744.80</i>	\$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

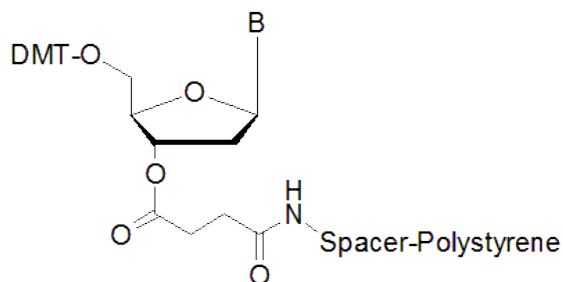
Catalog #	Product Name	Pore Size	Bulk CPG		pack of 4 cols.		pack of 10 cols.	
			100 mg	1 gm	0.2 μmole	1.0 μmole	0.2 μmole	1.0 μmole
N-3351-05	deoxy Adenosine	500Å	\$45	\$350	\$100	\$150	\$200	\$300
N-3351-10	(N-Bz) 5'-Icaa CPG	1000Å						
N-3352-05	deoxy Cytidine	500Å	\$45	\$350	\$100	\$150	\$200	\$300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

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)

Oligo Synthesis Products

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

Catalog #	Product Name	Pore Size	Particle Size	Bulk Polystyrene Loading 30-40 $\mu\text{m/gm}$			pack of 4 cols.			pack of 10 cols.		
				100	1	5	40	.02	1.0	40	0.2	1.0
				mg	gm	gm	nmole	μmole	μmole	nmole	μmole	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

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

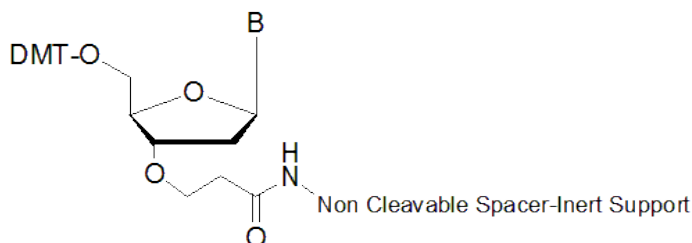
Our polystyrenes have a special linker and pore size (500Å). This unique cross-linking nature matches very closely with the commonly used CPG (500Å).

Our supports have consistently displayed outstanding performance for the synthesis of medium length oligos of varying sizes.

Please Indicate Synthesizer when Ordering

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

Phosphoramidites and Supports for Natural DNA Synthesis



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 $\mu\text{m/gm}$		pack of 4 cols.			pack of 10 cols.		
				100 mg	1 gm	40 nmole	0.2 μmole	1.0 μmole	40 nmole	0.2 μmole	1.0 μmole
N-7521-15	deoxy Adenosine (N-Bz)	300Å	15-20 μM	\$55	\$280	\$110	\$130	\$150	\$220	\$260	\$300
N-7521-60	3'-non-cleavable long chain spacer		60-70 μM								
N-7522-15	deoxy Cytidine (N-Bz)	300Å	15-20 μM	\$55	\$280	\$110	\$130	\$150	\$220	\$260	\$300
N-7522-60	3'-non-cleavable long chain spacer		60-70 μM								
N-7523-15	deoxy Guanosine	300Å	15-20 μM	\$55	\$280	\$110	\$130	\$150	\$220	\$260	\$300
N-7523-60	(N-iBu) 3'-non-cleavable long chain spacer		60-70 μM								
N-7524-15	Thymidine	300Å	15-20 μM	\$55	\$280	\$110	\$130	\$150	\$220	\$260	\$300
N-7524-60	3'-non-cleavable long chain spacer		60-70 μM								

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 synthesis 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.

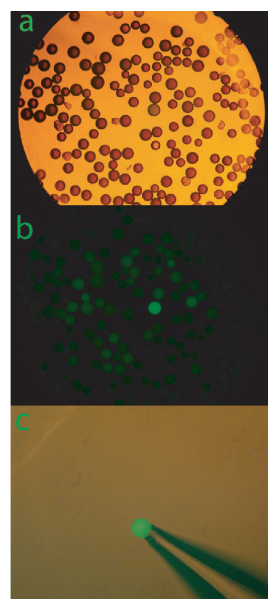
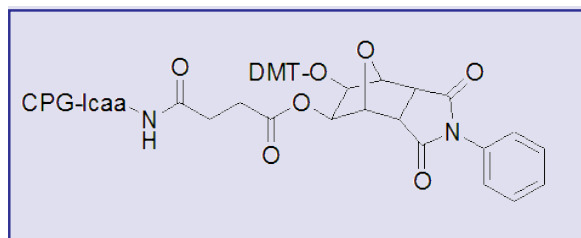


photo taken by permission from Nucleic Acid Research.

Oligo Synthesis Products

Phosphoramidites and Supports for Natural DNA Synthesis

UnyLinker Universal Support for Synthesis of Oligonucleotides



Catalog #	Product Name	Pore Size	Bulk CPG			pack of 4 cols.			each		pack of 10 cols.		
			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-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 300A		\$14	\$27	\$80	\$38	\$44	\$56	\$109	\$149	\$70	\$82	\$104

UNYLINKER™ Universal Support for synthesis of Oligodeoxynucleotides

(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 supplier 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.

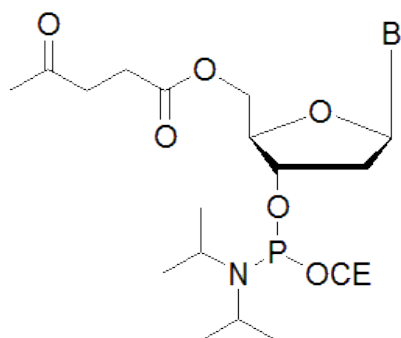
Fully compatible with Biotin and Fluorescein and other labeled oligonucleotides.

*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

Please Indicate Synthesizer when Ordering

<u>ABI</u>	<u>ABI 3900</u>	<u>Expedite</u>	<u>MerMade</u>	<u>PolyPlex</u>
AB30	AB39	EX	MR	PX

Phosphoramidites and Supports for Natural DNA Synthesis



Levuliny 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'-Levuliny deoxy Adenosine (N-Bz) 3'-CEP, <i>M.W. 653.67</i>	\$50	\$90	\$160	\$350
ANP-5002	5'-Levuliny deoxy Cytidine (N-Bz) 3'-CEP, <i>M.W. 629.64</i>	\$50	\$90	\$160	\$350
ANP-5003	5'-Levuliny deoxy Guanosine (N-iBu) 3'-CEP, <i>M.W. 635.65</i>	\$50	\$90	\$160	\$350
ANP-5004	5'-Levuliny Thymidine 3'-CEP, <i>M.W. 540.55</i>	\$50	\$90	\$160	\$350

Levuliny Deprotection Solution

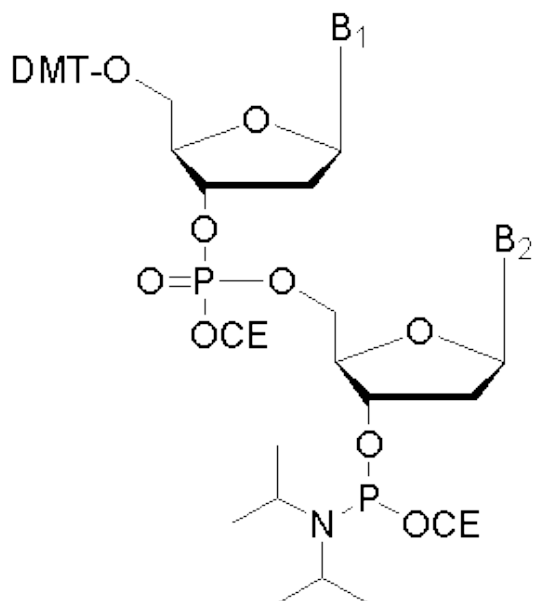
Catalog#	Pricing
CLP-7171	\$22.00 / 5 ml
	\$36.00 / 10 ml

Please Indicate Synthesizer when Ordering

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

Oligo Synthesis Products

Phosphoramidites and Supports for Natural DNA Synthesis



Dimers

Catalog#

Pricing

Pricing applies to all _____ \$ 600.00 / 100 μ mole
 dimers listed below _____ \$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 ₉ O 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 ₈ O 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 ₈ O 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 ₇ O ₁₅ P ₂

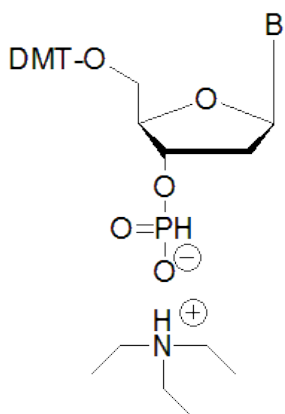
Dimer Phosphoramidites:

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

Please Indicate Synthesizer when Ordering _____

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

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, <i>M.W. 822.87</i>	\$30	\$50
ANP-3411	deoxy Cytidine (N-Bz) 3'-H-Phosphonate TEA Salt, <i>M.W. 798.84</i>	\$30	\$50
ANP-3412	deoxy Guanosine (N-iBu) 3'-H-Phosphonate TEA Salt, <i>M.W. 804.86</i>	\$30	\$50
ANP-3413	Thymidine 3'-H-Phosphonate TEA Salt, <i>M.W. 709.76</i>	\$30	\$50

Please Indicate Synthesizer when Ordering

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

Oligo Synthesis Products

Ancillary Reagents

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 Adamantanecarbonylchloride)	2 gm	\$ 85
		5 gm	\$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 ₂ O/THF)	45 ml	\$ 18
RN-1220-THT	**Oxidation Solution 2 (THF/H ₂ O/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.

Please Indicate Synthesizer when Ordering _____

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

Ancillary Reagents

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% Dichloroacetic Acid/Dichloromethane)	2 L	\$220
RN-1462-M-AB30	DMT Removal Reagent	450 ml	\$ 27
RN-1462-L-AB30	(3% Trichloroacetic Acid/Dichloromethane)	2 L	\$108
RN-1455-S-AB30	Oxidation Solution	200 ml	\$ 20
RN-1455-M-AB30	(0.02 M Iodine/Pyridine/H ₂ O/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 ₂ O/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

Oligo Synthesis Products

Ancillary Reagents

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% Dichloroacetic Acid/Dichloromethane)	2 L	\$220
RN-1462-M-AB39	DMT Removal Reagent	450 ml	\$ 27
RN-1462-L-AB39	(3% Trichloroacetic Acid/Dichloromethane)	2 L	\$108
RN-1455-M-AB39	Oxidation Solution	450 ml	\$ 60
RN-1455-L-AB39	(0.02 M Iodine/Pyridine/H ₂ O/THF)	2 L	\$250
RN-1456-M-AB39	Oxidation Solution	450 ml	\$ 60
RN-1456-L-AB39	(0.1 M Iodine/Pyridine/H ₂ O/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.

Ancillary Reagents

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

Standard DNA

Ancillary Reagents

Modified DNA

DNA Purification

Standard RNA

Modified RNA

RNA Purification

Chromophores&Ligands

Antisense

Please Indicate Synthesizer when Ordering

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

20

www.chemgenes.com

Email: info@chemgenes.com

Oligo Synthesis Products

Ancillary Reagents

Expedite Oligonucleotide Synthesizers

Catalog #	Product Name	8905		8909	
		Qty.	Price	Qty.	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% Dichloroacetic 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% Trichloroacetic 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 ₂ O/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 ₂ O/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.
 DTT Solution (Sulfurizing Reagents) see page 19, 22

Ancillary Reagents

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% Dichloroacetic Acid/Dichloromethane)	960 ml	\$220
RN-1462-M-MR	DMT Removal Reagent	450 ml	\$ 27
RN-1462-L-MR	(3% Trichloroacetic Acid/Dichloromethane)	960 ml	\$ 85
RN-1455-S-MR	Oxidation Solution	450 ml	\$ 60
RN-1455-M-MR	(0.02 M Iodine/Pyridine/H ₂ O/THF)	960 ml	\$135
RN-1456-S-MR	Oxidation Solution	450 ml	\$ 60
RN-1456-M-MR	(0.1 M Iodine/Pyridine/H ₂ O/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.

Oligo Synthesis Products

Ancillary Reagents

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% Dichloroacetic Acid/Dichloromethane)		
RN-1462-L-PX	DMT Removal Reagent	2 L	\$108
	(3% Trichloroacetic Acid/Dichloromethane)		
RN-1455-L-PX	Oxidation Solution	200 ml	\$ 30
	(0.02 M Iodine/Pyridine/H ₂ O/THF)		
RN-1456-M-PX	Oxidation Solution	200 ml	\$ 30
	(0.1 M Iodine/Pyridine/H ₂ O/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 repacked with drying traps an extra moisture free environment.

**** For Bulk pricing and details of Solid DDTT Solution (Sulfurizing Reagents) see page 145.

Phosphoramidites and Supports for Modified DNA Synthesis

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 modified 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 N¹ -Methyl dA, N¹-Methyl dG, N³ -Methyl dC, N³- Methyl T, N⁴ -Ethyl dC ,N³ -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.

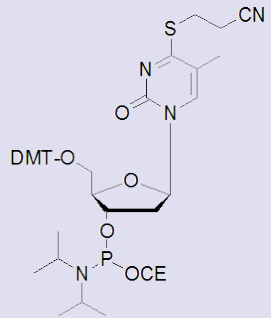
5'-O-Methyl DNA Phosphoramidites

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

Oligo Synthesis Products

Phosphoramidites and Supports for Modified DNA Synthesis

4-Thio Thymidine CEP



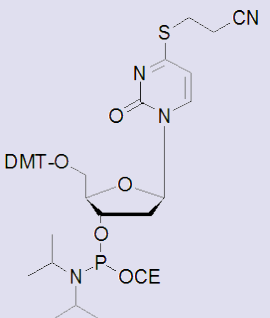
Catalog#
ANP-6414

Pricing
\$250.00 / 100 μ mole
\$600.00 / 250 mg

Purity: 98% +

C₄₃H₅₂N₅O₇PS
Mol. Wt.: 813.94

4-Thio deoxy Uridine CEP



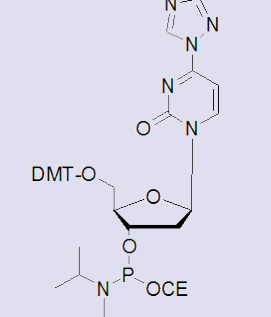
Catalog#
ANP-7624

Pricing
\$250.00 / 100 μ mole
\$600.00 / 250 mg

Purity: 98% +

C₄₂H₅₀N₅O₇PS
Mol. Wt.: 799.92

4-Triazolyl deoxy Uridine CEP (Convertible dU)



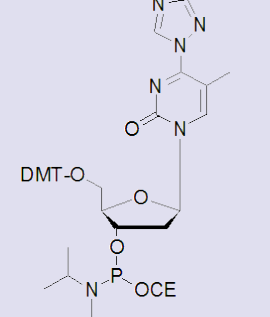
Catalog#
ANP-9211

Pricing
\$105.00 / 100 μ mole
\$290.00 / 250 mg

Purity: 98% +

C₄₁H₄₈N₇O₇P
Mol. Wt.: 781.84

4-Triazolyl Thymidine CEP (Convertible dT)



Catalog#
ANP-9212

Pricing
\$105.00 / 100 μ mole
\$290.00 / 250 mg

Purity: 98% +

C₄₂H₅₀N₇O₇P
Mol. Wt.: 795.86

3'-Succinyl Icaa Supports & Columns

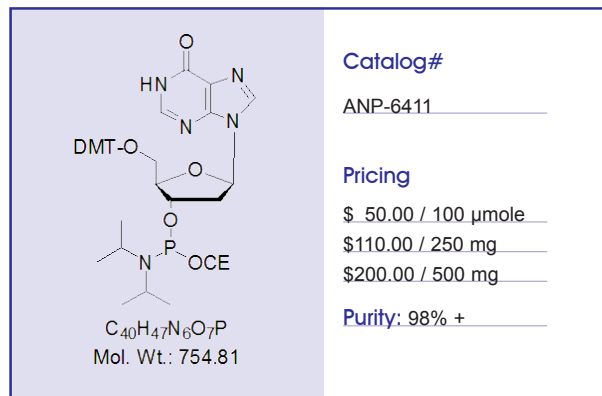
Catalog #	Product Name	Pore Size	Bulk CPG		pack of 4 cols.		pack of 10 cols.	
			100 mg	1 gm	0.2 μ mole	1.0 μ mole	0.2 μ mole	1.0 μ mole
N-9758-05	4-Thio deoxy	500Å	\$90	\$735	\$80	\$120	\$160	\$240
N-9758-10	Uridine 3'-Icaa CPG	1000Å						
N-9925-05	4-Thio Thymidine	500Å	\$80	\$735	\$90	\$120	\$160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

Please Indicate Synthesizer when Ordering

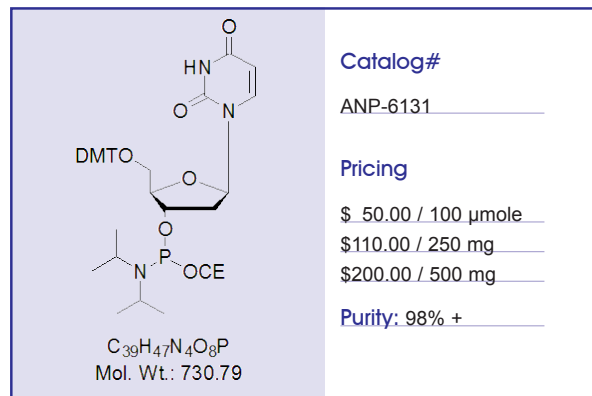
ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

Phosphoramidites and Supports for Modified DNA Synthesis

deoxy Inosine CEP



deoxy Uridine CEP



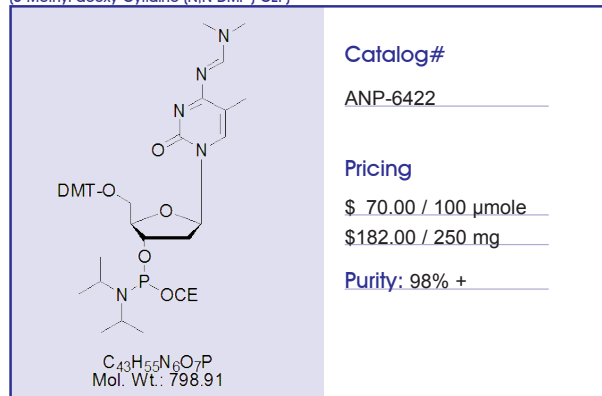
Deoxy Inosine amidites: Universal bases hybridize non-selectively to each of native bases. For a recent publication in this field, see, M. Berger, Y.W., A.K.Ogawa, D.L.McMinn, P.G. Schultz, and F.E. Rosenberg, Nucleic Acids Research, 2000, 28, 2911-2914.

3'-Succinyl Icaa Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG			pack of 4 cols.		pack of 10 cols.	
			100 mg	1 gm	5 gm	0.2 μmole	1.0 μmole	0.2 μmole	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							

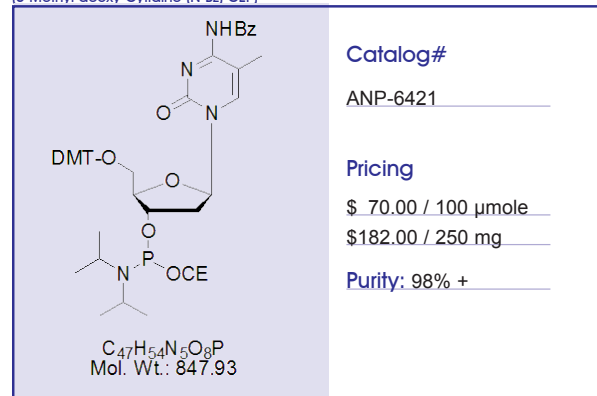
5-Methyl deoxy Cytidine CEP

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



5-Methyl deoxy Cytidine CEP

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



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		pack of 4 cols.		pack of 10 cols.	
			100 gm	1 gm	0.2 μmole	1.0 μmole	0.2 μmole	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						

Oligo Synthesis Products

Phosphoramidites and Supports for Modified DNA Synthesis

alpha deoxy Adenosine CEP

<chem>C47H52N7O7P</chem> Mol. Wt.: 857.93	Catalog# ANP-1651 Pricing \$165.00 / 100 μmole \$360.00 / 250 mg Purity: 98% +
--	---

alpha deoxy Cytidine (N-Bz) CEP

<chem>C46H52N5O8P</chem> Mol. Wt.: 833.91	Catalog# ANP-1652 Pricing \$165.00 / 100 μmole \$360.00 / 250 mg Purity: 98% +
--	---

alpha deoxy Guanosine CEP

<chem>C44H54N7O8P</chem> Mol. Wt.: 839.92	Catalog# ANP-1653 Pricing \$165.00 / 100 μmole \$360.00 / 250 mg Purity: 98% +
--	---

alpha Thymidine CEP

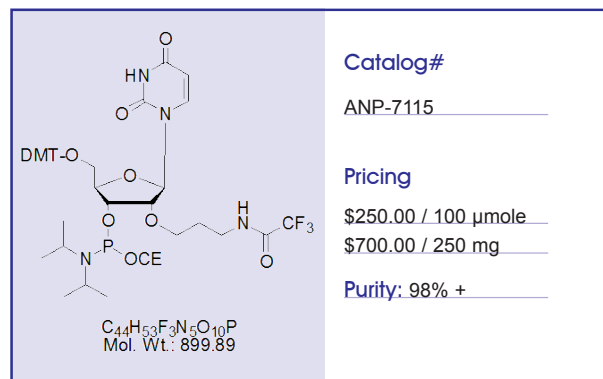
<chem>C40H49N4O8P</chem> Mol. Wt.: 744.81	Catalog# ANP-1654 Pricing \$165.00 / 100 μmole \$360.00 / 250 mg Purity: 98% +
--	---

alpha deoxy Cytidine (N-Ac) CEP

<chem>C41H50N5O8P</chem> Mol. Wt.: 771.84	Catalog# ANP-4676 Pricing \$165.00 / 100 μmole \$360.00 / 250 mg Purity: 98% +
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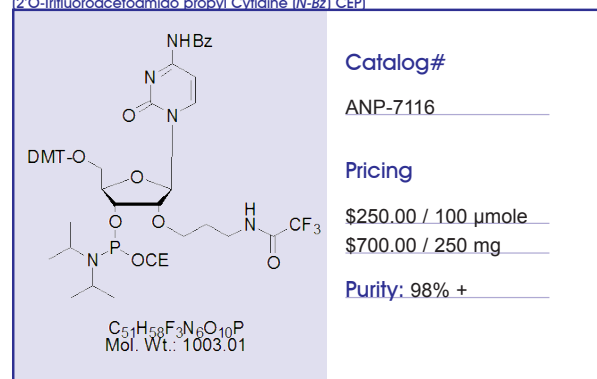
Phosphoramidites and Supports for Modified DNA Synthesis

2'-O-Trifluoroacetoamido propyl Uridine CEP



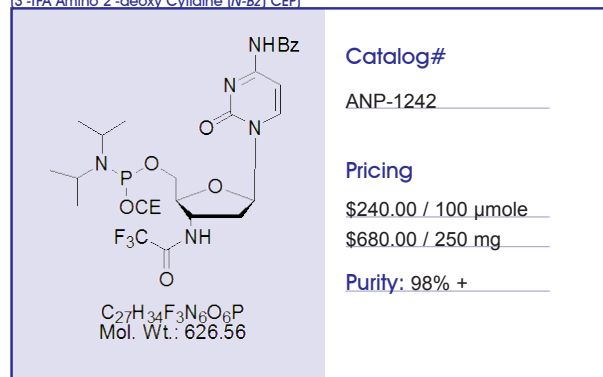
2'-O-Trifluoroacetoamido propyl Cytidine CEP

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

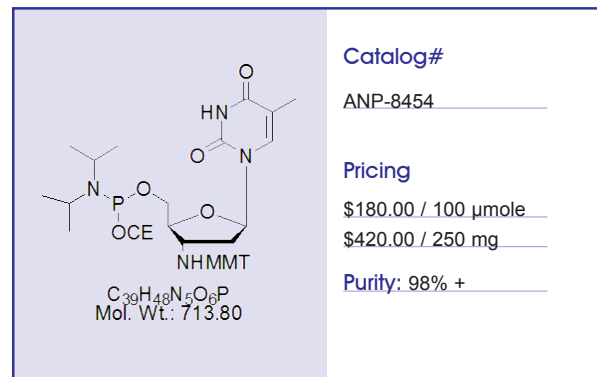


3'-TFA Amino Cytidine CEP

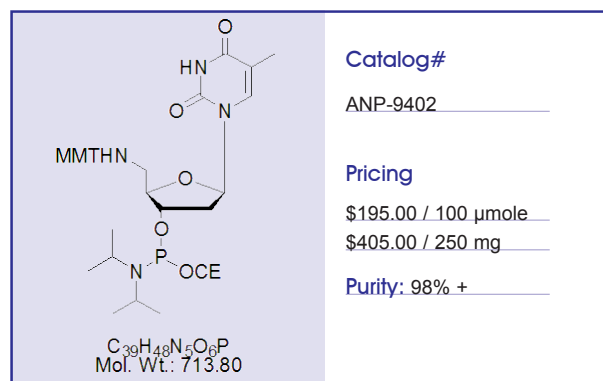
(3'-TFA Amino 2'-deoxy Cytidine (N-Bz) CEP)



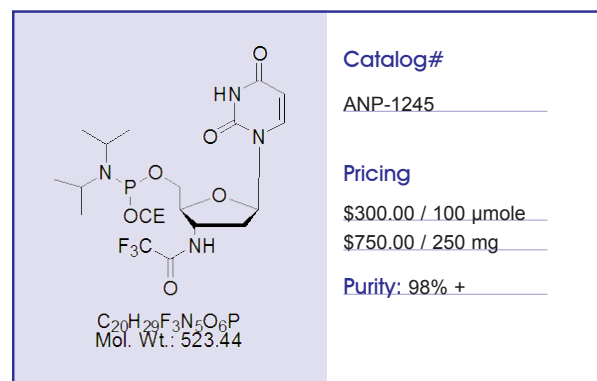
3'-MMT Amino Thymidine CEP



5'-MMT Amino Thymidine CEP



3'-TFA Amino deoxy Uridine 5'-CEP



3'-Succinyl Icaa Supports & Columns

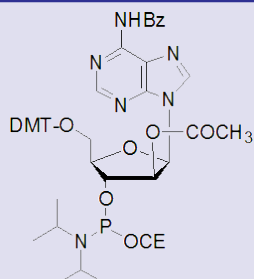
Catalog #	Product Name	Pore Size	Bulk CPG		pack of 4 cols.		pack of 10 cols.	
			100 mg	1 gm	0.2 μ mole	1.0 μ mole	0.2 μ mole	1.0 μ mole
N-9506-05	5'-Amino Thymidine	500Å	\$110	\$850	\$120	\$180	\$240	\$360
N-9506-10	3'-Icaa CPG	1000Å						

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

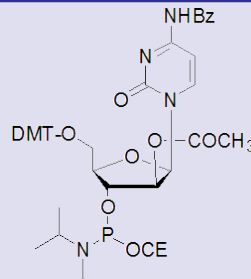
\$155.00 / 100 μ mole

\$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

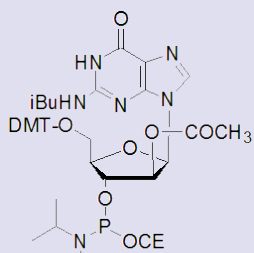
\$160.00 / 100 μ mole

\$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

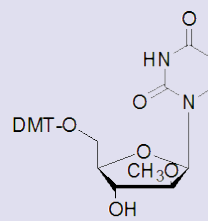
\$160.00 / 100 μ mole

\$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 μ mole

\$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).

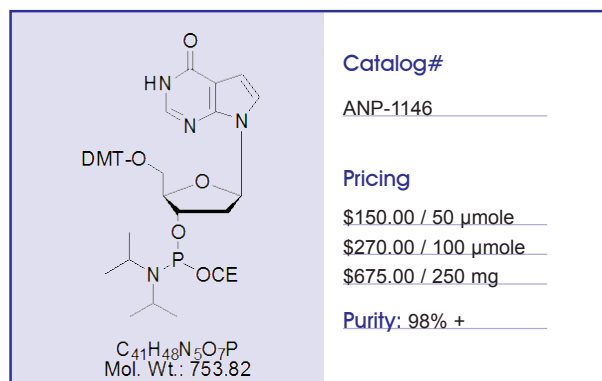
AraC nucleoside is a potent antileukemic agent as well as an inhibitor of DNA replication, through a mechanism which is not yet fully understood (P. P. Major et al., *Proc. Natl. Acad. Sci. USA*, 78, 3235, 1981).

Arabinoside Icaa Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG		pack of 4 cols.		pack of 10 cols.	
			100 mg	1 gm	0.2 μ mole	1.0 μ mole	0.2 μ mole	1.0 μ mole
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						

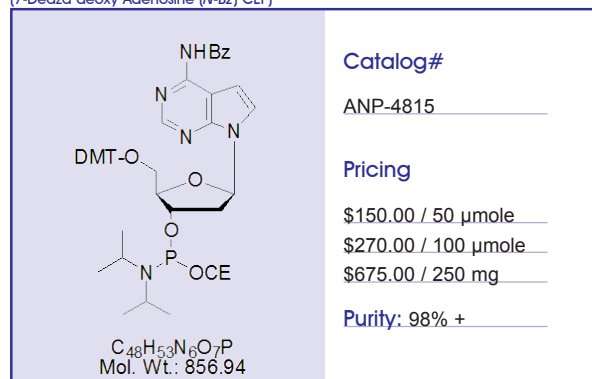
Phosphoramidites and Supports for Modified DNA Synthesis

7-Deaza deoxy Inosine CEP

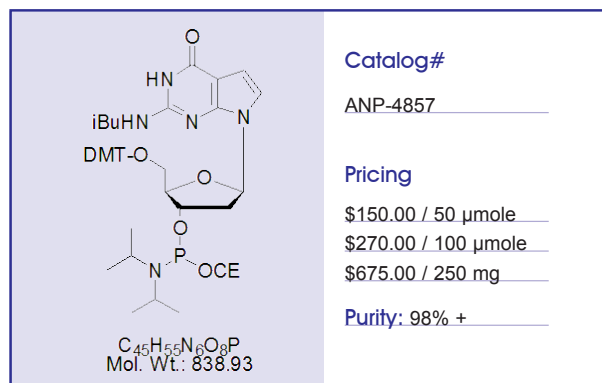


7-Deaza deoxy Adenosine CEP

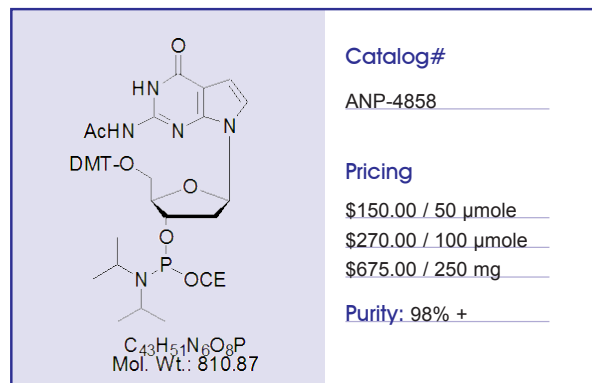
(7-Deaza deoxy Adenosine (N-Bz) CEP)



7-Deaza deoxy (N-iBu) Guanosine CEP



7-Deaza deoxy (N-Ac) Guanosine CEP



7-Deaza 3'-Succinyl Icaa Supports & Columns

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

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 Corresponding ribo 7-Deaza Amidites see page 69.

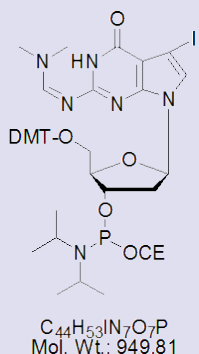
For Corresponding 7-Deaza-2'-O-methyl amidites see page 103.

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)



Catalog#

ANP-4589

Pricing

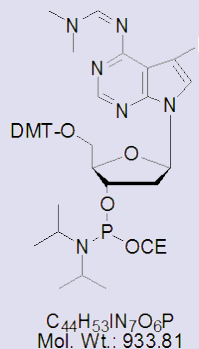
\$225.00 / 50 μ mole

\$405.00 / 100 μ mole

Purity: 98% +

5'-DMT-7-Deaza-7-Iodo deoxy Adenosine CEP

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



Catalog#

ANP-4586

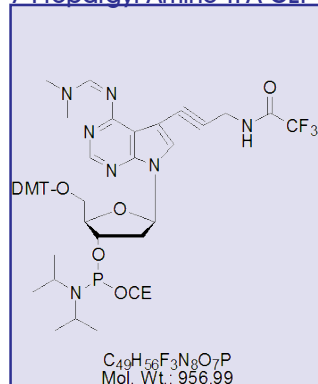
Pricing

\$225.00 / 50 μ mole

\$405.00 / 100 μ mole

Purity: 98% +

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



Catalog#

ANP-1339

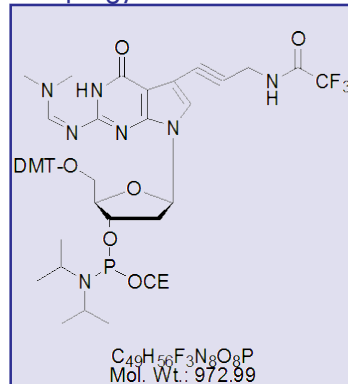
Pricing

\$265.00 / 50 μ mole

\$360.00 / 100 μ mole

Purity: 98% +

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



Catalog#

ANP-1354

Pricing

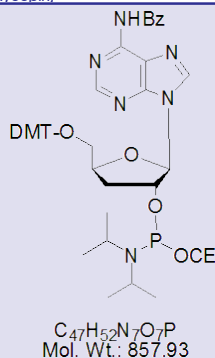
\$265.00 / 50 μ mole

\$475.00 / 100 μ mole

Purity: 98% +

3' deoxy Adenosine (N-Bz) CEP

(Cordycepin)



Catalog#

ANP-9312

Pricing

\$385.00 / 100 μ mole

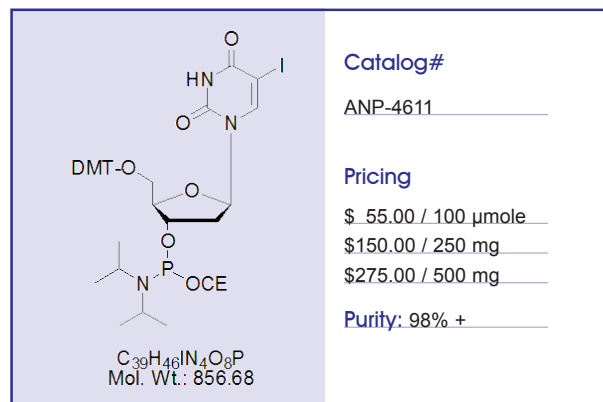
Purity: 98% +

3'-dA Icaa Supports & Columns

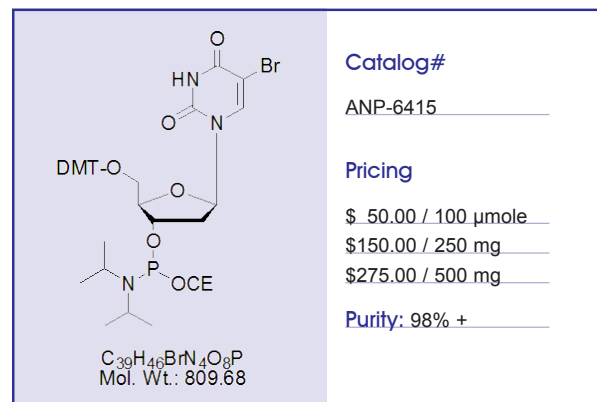
Catalog #	Product Name	Pore Size	Bulk CPG	pack of 4 cols.		pack of 10 cols.	
			100 mg	0.2 μ mole	1.0 μ mole	0.2 μ mole	1.0 μ mole
N-9502-05	3' deoxy Adenosine (N-Bz)	500Å	\$295	\$200	\$400	\$400	\$800
N-9502-10	3'-Icaa CPG (Cordycepin)	1000Å					

Phosphoramidites and Supports for Modified DNA Synthesis

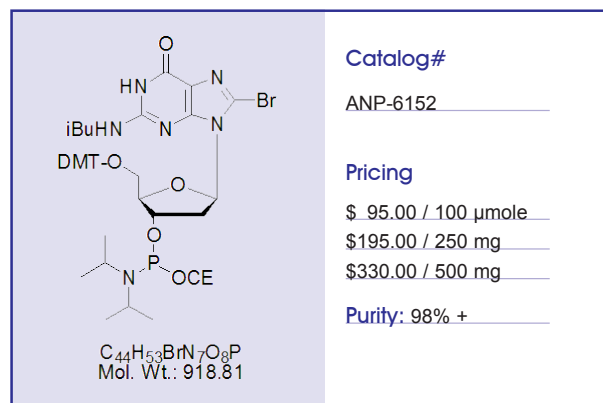
5-Iodo deoxy Uridine CEP



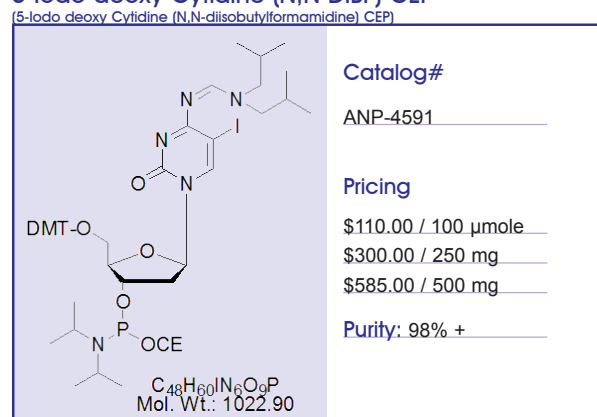
5-Bromo deoxy Uridine CEP



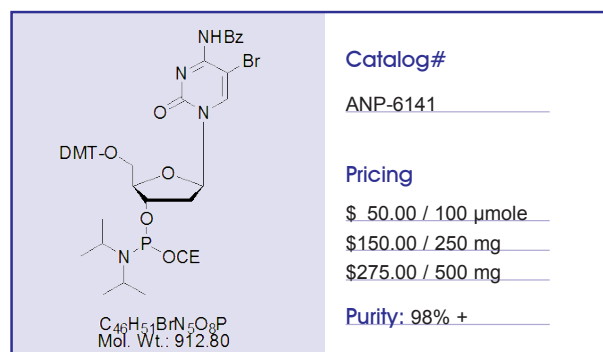
8-Bromo deoxy Guanosine (N-iBu) CEP



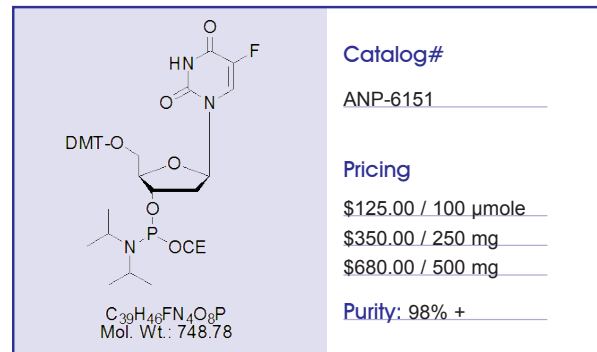
5-Iodo deoxy Cytidine (N,N-DIBF) CEP



5-Bromo deoxy Cytidine (N-Bz) CEP



5-Fluoro deoxy Uridine 5'-CEP



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.

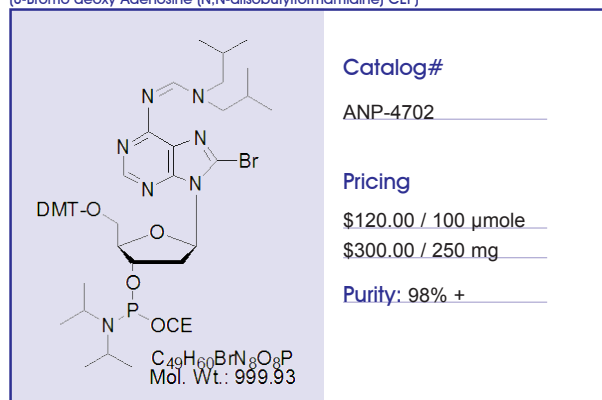
Such DNA or RNA probes containing 8-Bromo Adenosine or Guanosine could thus be useful to determine specific contact in protein-DNA complexes (J. Liu, G. L. Verdine, *Tet. Letters*, 33, 4265, 1992).

Oligo Synthesis Products

Phosphoramidites and Supports for Modified DNA Synthesis

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

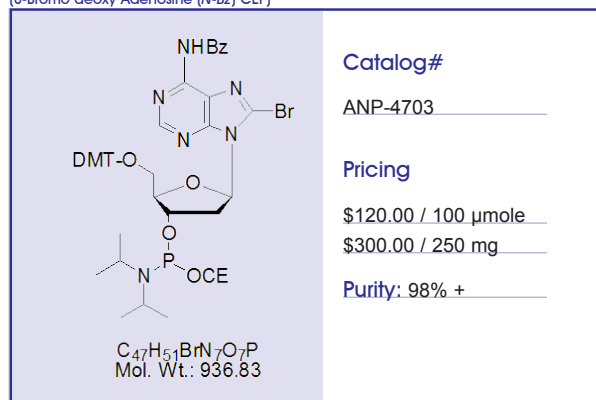
(8-Bromo deoxy Adenosine (N,N-diisobutylformamide) CEP)



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 compatible with PAC Chemistry.

8-Bromo deoxy Adenosine (N-Bz) CEP

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



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

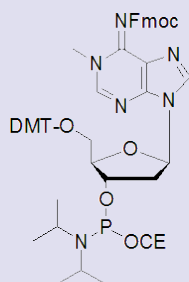
Halogenated Purines & Pyrimidines Supports And Columns

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

Phosphoramidites and Supports for Modified DNA Synthesis

N¹-Methyl deoxy Adenosine CEP

(N¹-Methyl deoxy Adenosine (N-Fmoc) CEP)



C₅₆H₈₀N₇O₈P
Mol. Wt.: 990.09

Catalog#

ANP-6121

Pricing

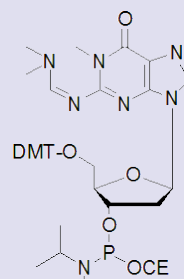
\$126.50 / 100 μmole

\$286.00 / 250 mg

Purity: 98% +

N¹-Methyl deoxy Guanosine CEP

(N¹-Methyl deoxy Guanosine (N,N-DMF) CEP)



C₄₄H₅₅N₈O₇P
Mol. Wt.: 838.93

Catalog#

ANP-6122

Pricing

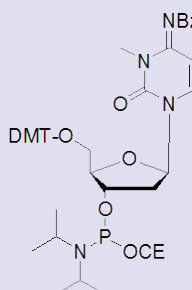
\$126.50 / 100 μmole

\$286.00 / 250 mg

Purity: 98% +

N³-Methyl deoxy Cytidine CEP

(N³-Methyl deoxy Cytidine (N-Bz) CEP)



C₄₇H₅₄N₅O₈P
Mol. Wt.: 847.93

Catalog#

ANP-3851

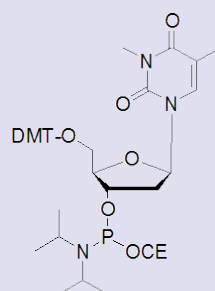
Pricing

\$225.00 / 100 μmole

\$450.00 / 250 mg

Purity: 98% +

N³-Methyl Thymidine CEP



C₄₁H₅₁N₄O₈P
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.

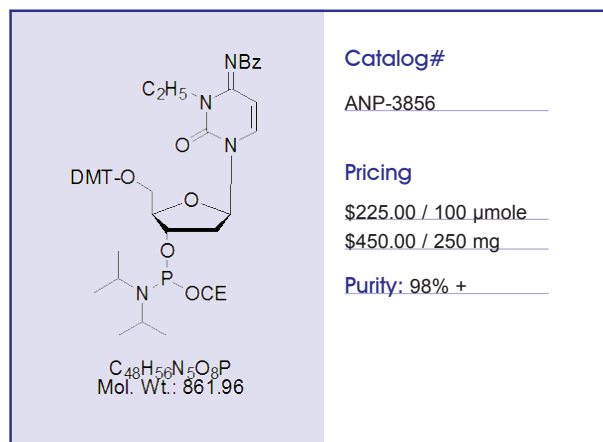
N-alkylated nucleosides and the oligonucleotides incorporating methylated bases at specific sites in oligonucleotides possess great potential for studies of reversal of alkylation in oligonucleotides and studies in oxidative alkylation inside cells by various carcinogens.

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

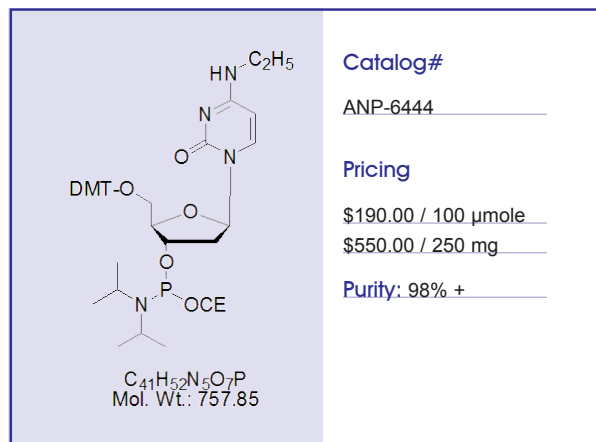
Oligo Synthesis Products

Phosphoramidites and Supports for Modified DNA Synthesis

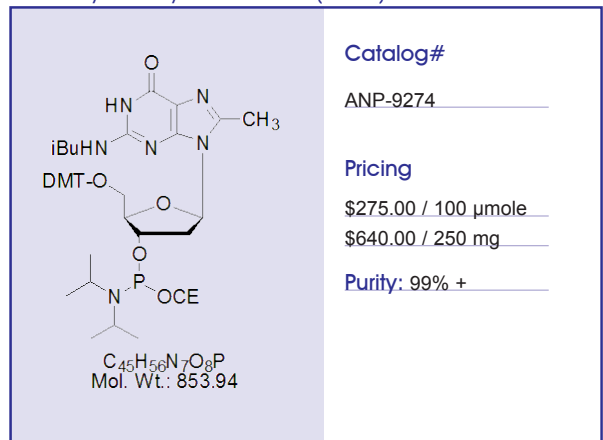
N³-Ethyl deoxy (N-Bz) Cytidine CEP



N⁴-Ethyl deoxy Cytidine CEP



8-Methyl deoxy Guanosine (N-iBu) CEP



8-Methyl deoxy Guanosine Phosphoramidites

ChemGenes now offers 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. Similarly 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., Femandjian, S., Nucl. Acids Res., 31, 23, 6986-6995, 2003.

N-Alkylated 3'-Succinyl Icaa Supports & Columns

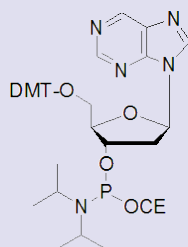
Catalog #	Product Name	Pore Size	Bulk CPG		pack of 4 cols.		pack of 10 cols.	
			100 mg	1 gm	0.2 μmole	1.0 μmole	0.2 μmole	1.0 μmole
N-9980-05	N ¹ -Methyl deoxy Adenosine	500Å	\$125	\$970	\$90	\$125	\$180	\$250
N-9980-10	(N-Fmoc) 3'-Icaa CPG	1000Å						
N-9981-05	N ¹ -Methyl deoxy Guanosine	500Å	\$125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

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*).

Phosphoramidites and Supports for Modified DNA Synthesis

Nebularine

(2-deoxy Purine CEP)



C₄₀H₄₇N₆O₆P
Mol. Wt.: 738.81

Catalog#

ANP-7601

Pricing

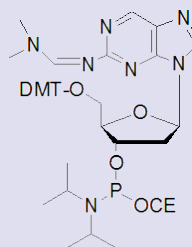
\$ 95.00 / 100 μmole

\$240.00 / 250 mg

Purity: 98% +

2-Amino deoxy Purine CEP

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



C₄₃H₅₃N₈O₆P
Mol. Wt.: 808.91

Catalog#

ANP-9317

Pricing

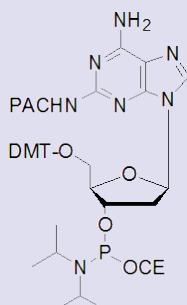
\$110.00 / 100 μmole

Purity: 98% +

ANP-9315 with *N*-*i*Bu protection has been discontinued.

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

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



C₄₈H₅₅N₉O₆P
Mol. Wt.: 902.97

Catalog#

ANP-9316

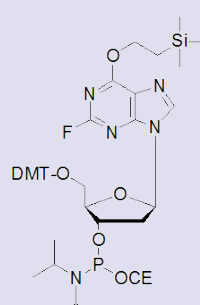
Pricing

\$335.00 / 100 μmole

Purity: 98% +

2-Fluoro deoxy Inosine CEP (O⁶-trimethyl silyl ethoxy)

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



C₄₅H₅₈FN₆O₇PSi
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		pack of 4 cols.		pack of 10 cols.	
			100 mg	1 gm	0.2 μmole	1.0 μmole	0.2 μmole	1.0 μmole
N-9511-05	2-Amino deoxy Purine	500Å	\$110	\$650	\$80	\$120	\$160	\$240
N-9511-10	(N,N-DMF) 3'-Icaa CPG	1000Å						
N-9503-05	Nebularine	500Å	\$110	\$750	\$120	\$140	\$240	\$280
N-9503-10	(deoxy Purine) 3'-Icaa CPG	1000Å						
N-9512-05	2-Amino deoxy Adenosine	500Å	\$110	\$700	\$90	\$120	\$180	\$240
N-9512-10	(N-PAC) 3'-Icaa CPG	1000Å						
N-9926-05	2-Fluoro deoxy Inosine	500Å	\$125	\$970	\$100	\$150	\$200	\$300
N-9926-10	(O6-tert-butyl-silyl ethoxy) 3'-Icaa CPG	1000Å						

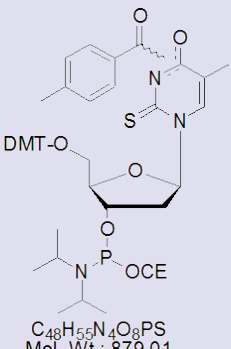
Please Indicate Synthesizer when Ordering

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

Oligo Synthesis Products

Phosphoramidites and Supports for Modified DNA Synthesis

2-Thio Thymidine CEP



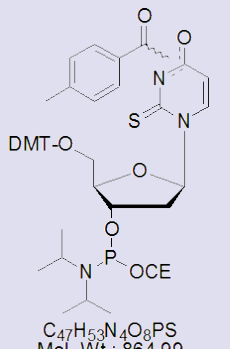
Catalog#
ANP-9213

Pricing
\$280.00 / 100 μ mole
\$655.00 / 250 mg

Purity: 98% +

Chemical Formula: C₄₈H₅₅N₄O₈PS
Mol. Wt.: 879.01

2-Thio deoxy Uridine CEP



Catalog#
ANP-9214

Pricing
\$290.00 / 100 μ mole
\$670.00 / 250 mg

Purity: 98% +

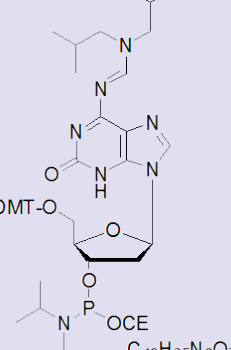
Chemical Formula: C₄₇H₅₃N₄O₈PS
Mol. Wt.: 864.99

2 Thio 3'-Succinyl Icaa Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG					
			100 mg	1 gm	0.2 μ mole	1.0 μ mole	0.2 μ mole	1.0 μ mole
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-diisobutylformamide) CEP)



Catalog#
ANP-4268

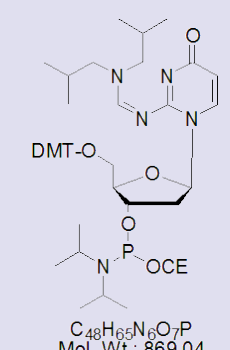
Pricing
\$300.00 / 100 μ mole
\$750.00 / 250 mg

Purity: 98% +

Chemical Formula: C₄₉H₆₅N₈O₇P
Mol. Wt.: 909.06

deoxy isoCytidine CEP

(deoxy isoCytidine (N,N-diisobutylformamide) CEP)



Catalog#
ANP-4269

Pricing
\$300.00 / 100 μ mole
\$750.00 / 250 mg

Purity: 98% +

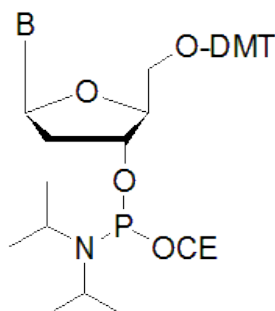
Chemical Formula: C₄₈H₆₅N₆O₇P
Mol. Wt.: 869.04

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

IsoG & IsoC 3'-Succinyl Icaa Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG		pack of 4 cols.		pack of 10 cols.	
			100 mg	1 gm	0.2 μ mole	1.0 μ mole	0.2 μ mole	1.0 μ mole
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						

Phosphoramidites and Supports for Modified DNA Synthesis



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, <i>M.W.</i> 857.92	\$140	\$275	\$505	\$ 927	\$2,125
ANP-8032	β-L-deoxy Cytidine (N-Bz) 3'-CEP, <i>M.W.</i> 833.89	\$140	\$275	\$505	\$ 927	\$2,125
ANP-8033	β-L-deoxy Guanosine (N-iBu) CEP, <i>M.W.</i> 839.90	\$155	\$295	\$530	\$ 973	\$2,233
ANP-8034	β-L-Thymidine 3'-CEP, <i>M.W.</i> 744.80	\$150	\$290	\$525	\$ 963	\$2,223
ANP-8035	β-L-deoxy Cytidine (N-Ac) 3'-CEP, <i>M.W.</i> 771.84	\$150	\$305	\$565	\$1,037	\$2,380

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

- b-L-deoxyribonucleoside polymers do not form double strands with complementary strands. (*Ulysse Aseline, et. al., N.A.R. 19, 15 4067-4074 1991*).
- b-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*).
- b-L-deoxyribonucleosides are being developed to bind with great specificity to antibodies and small biologically active molecules.
- b-L-DNA attached to primers for microarray design (Fig.1).
- b-L-DNA attached molecular beacons for site specific binding (Fig. 2).

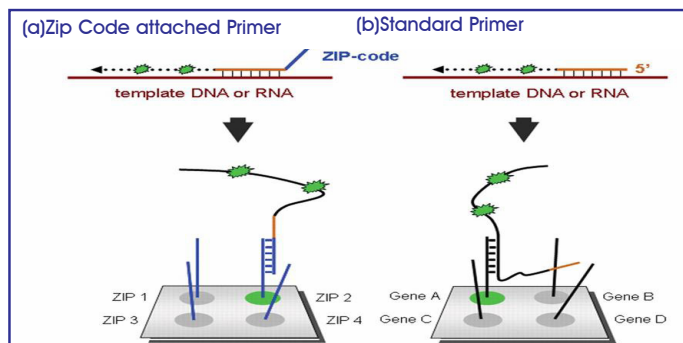


Fig1. Template Specific Primer Extension & Labelling Illustration of advantages of L-DNA (Zip Code) attached Primers for PCR and Microarray (Nucleic Acids Research; 2007, Vol. 35, No. 21, 7279-7287)
Reproduced by the kind permission of Oxford Press, UK

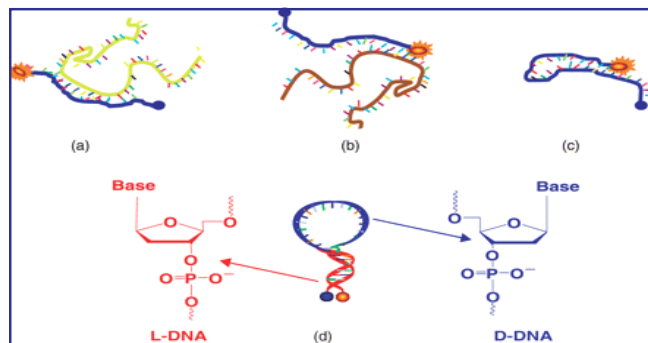
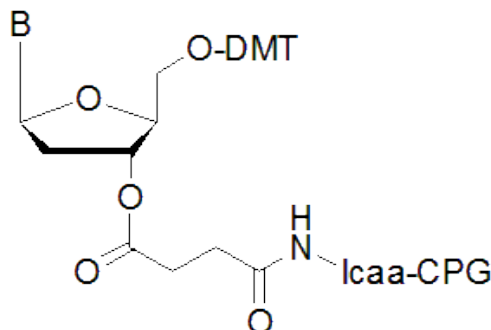


Fig2. Application of L-DNA attached molecular beacons (MB) avoiding non-specific binding (a-c). Design of Universal Microarray Platform. (Nucleic Acids Research; 2006, Vol. 34, No. 18, 5101-5111)
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Oligo Synthesis Products

Phosphoramidites and Supports for Modified DNA Synthesis



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			pack of 4 cols.		pack of 10 cols.	
			100 mg	500 mg	1 gm	0.2 μ mole	1.0 μ mole	0.2 μ mole	1.0 μ mole
N-3521-05	β -L-deoxy Adenosine (N-Bz)	500Å	\$125	\$290	\$465	\$120	\$240	\$240	\$480
N-3521-10	3'-Icaa CPG	1000Å							
N-3522-05	β -L-deoxy Cytidine (N-Bz)	500Å	\$125	\$290	\$465	\$120	\$240	\$240	\$480
N-3522-10	3'-Icaa CPG	1000Å							
N-3523-05	β -L-deoxy Guanosine (N-iBu)	500Å	\$125	\$290	\$465	\$120	\$240	\$240	\$480
N-3523-10	3'-Icaa CPG	1000Å							
N-3524-05	β -L-Thymidine	500Å	\$125	\$290	\$465	\$120	\$240	\$240	\$480
N-3524-10	3'-Icaa CPG	1000Å							
N-3525-05	β -L-deoxy Cytidine (N-Ac)	500Å	\$125	\$290	\$465	\$120	\$240	\$240	\$480
N-3525-10	3'-Icaa CPG	1000Å							

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

Catalog#
ANP-6067

Pricing
\$275.00 / 100 μ mole
\$640.00 / 250 mg

Purity: 99% +

$C_{45}H_{55}N_4O_{12}P$
 Mol. Wt.: 874.91

5- Formyl Uridine phosphoramidite

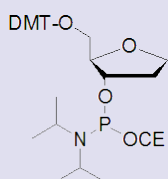
It has been shown that 5-Formyl-2'-deoxy uridine is formed in DNA as a result of ionization radiation and several means such as gamma-ray irradiation and other oxidative damages^{1,2}. The damaged DNA, due to formation of 5-formyl uracil, causes mutagenesis. We now offer the 5-formyl dU-phosphoramidite 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.

Phosphoramidites and Supports for Modified DNA Synthesis

Abasic Phosphoramidite

(1,2-dideoxy D-ribose CEP)



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

Catalog#

ANP-7058

Pricing

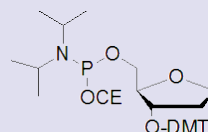
\$85.00 / 100 μ mole

\$300.00 / 250 mg

Purity: 98% +

Reverse Abasic Phosphoramidites

(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 μ mole

\$425.00 / 250 mg

Purity: 98% +

Abasic Site

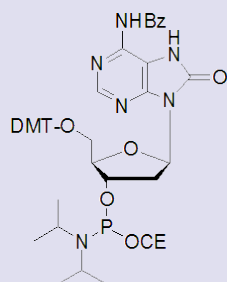
Oligonucleotides containing the chemically stable isostructural tetrahydrofuran analog of an abasic site are important reagents for studies related to depurination of oligonucleotides, which occurs quite frequently within the cell. For a good publication regarding T_M values etc., see (I. Pompizi, A. 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	pack of 4 cols.		pack of 10 cols.	
			100 mg	0.2 μ mole	1.0 μ mole	0.2 μ mole	1.0 μ mole
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

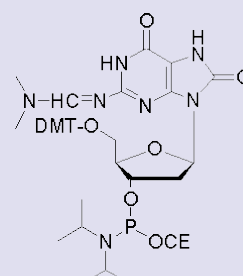
\$130.00 / 100 μ mole

\$345.00 / 250 mg

Purity: 98% +

8-Oxo deoxy Guanosine CEP*** **NEW!**

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



$C_{43}H_{53}N_5O_8P$
Mol. Wt.: 840.90

Catalog#

ANP-9416

Pricing

\$285.00 / 100 μ mole

\$800.00 / 250 mg

Purity: 99% +

3'-Succinyl Icaa Supports & Columns

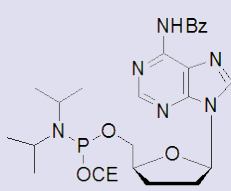
Catalog #	Product Name	Pore Size	Bulk CPG		pack of 4 cols.		pack of 10 cols.	
			100 mg	1 gm	0.2 μ mole	1.0 μ mole	0.2 μ mole	1.0 μ mole
N-5300-05	8-Oxo deoxy Adenosine	500Å	\$110	\$780	\$120	\$145	\$240	\$290
N-5300-10	(N-Bz) 3'-Icaa CPG	1000Å						
N-9501-05	8-Oxo deoxy Guanosine	500Å	\$125	\$900	\$135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

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

Oligo Synthesis Products

Phosphoramidites and Supports for Modified DNA Synthesis

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



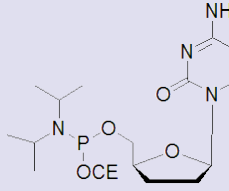
Catalog#
DDN-7051

Pricing
\$130.00 / 100 μ mole
\$540.00 / 250 mg

Purity: 98% +

Chemical Formula: $C_{26}H_{34}N_7O_5P$
Mol. Wt.: 539.57

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



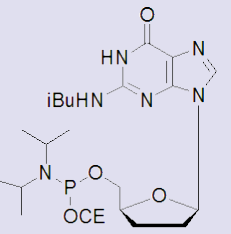
Catalog#
DDN-7052

Pricing
\$130.00 / 100 μ mole
\$540.00 / 250 mg

Purity: 98% +

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

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



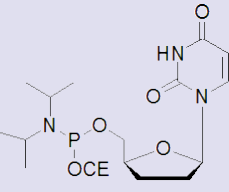
Catalog#
DDN-7053

Pricing
\$130.00 / 100 μ mole
\$540.00 / 250 mg

Purity: 98% +

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

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



Catalog#
DDN-7054

Pricing
\$130.00 / 100 μ mole
\$540.00 / 250 mg

Purity: 98% +

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

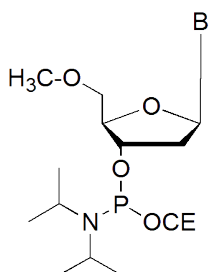
Dideoxy Succinyl Icaa Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG		pack of 4 cols.		pack of 10 cols.	
			100 mg	1 gm	0.2 μ mole	0.2 μ mole	0.2 μ mole	0.2 μ mole
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

Phosphoramidites and Supports for Modified DNA Synthesis



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	100 μ mole	250mg	500mg
ANP-5511	5'-O-Methyl deoxy-Adenosine (N-Bz) 3'-CEP, <i>M.W. 569.6</i>	\$150	\$290	\$495
ANP-5512	5'-O-Methyl deoxy-Cytidine (N-Bz) 3'-CEP, <i>M.W. 545.6</i>	\$150	\$290	\$495
ANP-5513	5'-O-Methyl deoxy-Guanosine (N-iBu) CEP, <i>M.W. 551.58</i>	\$155	\$295	\$495
ANP-5514	5'-O-Methyl deoxy-Thymidine 3'-CEP, <i>M.W. 456.47</i>	\$140	\$275	\$495

Please Indicate Synthesizer when Ordering _____

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

Oligo Synthesis Products

DNA Purification & Drying Traps

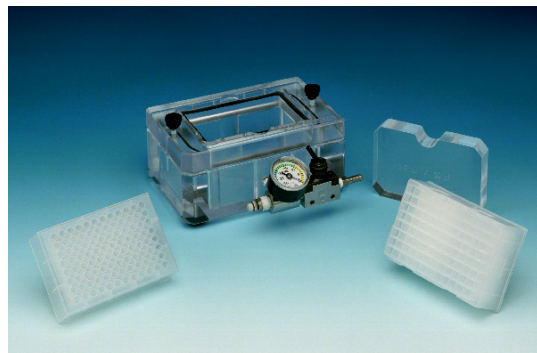
DNA PURIFICATION

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 accommodates 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 Oligo Purification Plate (For 25-30 OD Purification)	\$

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 purification/cleanup. Each well is capable of the following:

- DMT-ON purification of up to 1 μ mole 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.

DNA Purification & Drying Traps

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

Oligo Synthesis Products

DNA Purification & Drying Traps

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 NH₃ deprotection of the oligonucleotide, the NH₃ 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.

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



Oligo Synthesis Products

Phosphoramidites and Supports for Natural RNA Synthesis

RNA Synthesis

The importance of RNA has long been recognized in cellular processes. A major area of focus is on antisense RNA (*C. Hélène, 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 pursued 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*).

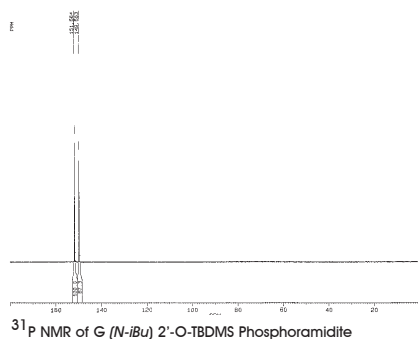
Please see page 17-23 as Ancillary Reagent and page 145 for for bulk quantity supply for ordering information.

Phosphoramidites and Supports for Natural RNA Synthesis

Quality Control Criteria for UltraPure RNA Phosphoramidites

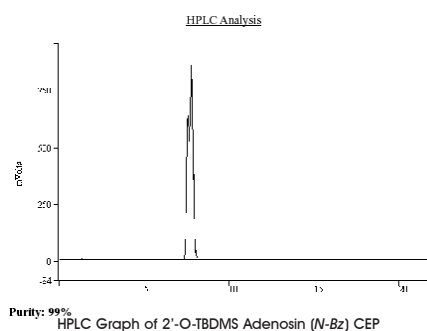
^{31}P NMR

- Single or double peak
- Detection Limit: 0.08%



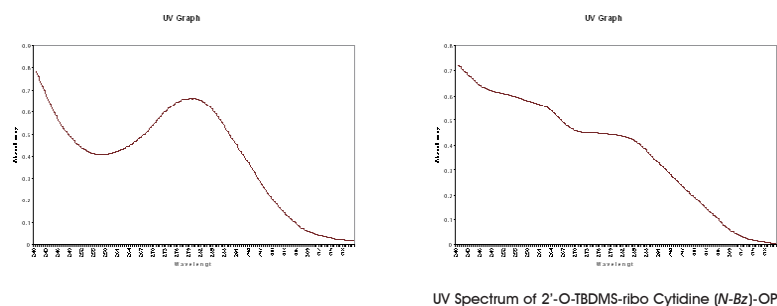
HPLC

- Single or double peak
- Detection limit: 0.5%



UV Characterization

- Used to characterize the purine or pyrimidine structure and substituent



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

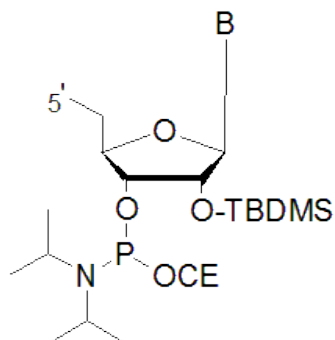
- Sharp doublet in most cases, or a single spot
- Detection Limit 0.5%
- No visible impurity observed

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)

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, <i>M.W. 988.19</i>	\$32	\$58	\$96	\$152
ANP-5672	2'-O-TBDMS Cytidine (N-Bz) 3'-CEP, <i>M.W. 964.17</i>	\$32	\$58	\$96	\$152
ANP-5673	2'-O-TBDMS Guanosine (N-iBu) 3'-CEP, <i>M.W. 970.18</i>	\$32	\$58	\$96	\$152
ANP-5674	2'-O-TBDMS Uridine 3'-CEP, <i>M.W. 861.05</i>	\$32	\$58	\$96	\$152
ANP-4546	2'-O-TBDMS Adenosine (N-Ac) 3'-CEP, <i>M.W. 926.12</i>	\$32	\$58	\$96	\$152
ANP-6676	2'-O-TBDMS Cytidine (N-Ac) 3'-CEP, <i>M.W. 902.10</i>	\$32	\$58	\$96	\$152
ANP-4547	2'-O-TBDMS Guanosine (N-Ac) 3'-CEP, <i>M.W. 942.12</i>	\$32	\$58	\$96	\$152
ANP-5676	MMT-2'-O-TBDMS Adenosine (N-Bz) 3'-CEP, <i>M.W. 958.17</i>	\$32	\$58	\$96	\$152
ANP-5677	MMT-2'-O-TBDMS Guanosine (N-iBu) 3'-CEP, <i>M.W. 940.15</i>	\$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

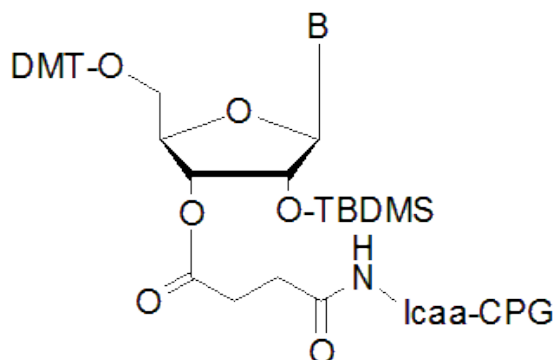
Due to the use of 5-ethylthiotetrazole (in most DNA/RNA Synthesis protocols), which is more acidic in nature compared to 1-H Tetrazole, the DMT group from purine bases is removed to a certain extent in the coupling step during oligo synthesis, thereby causing undesired M+1 oligo growth.

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

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

Catalog #	Product Name	Pore Size	Bulk CPG		pack of 4 cols.			each		pack of 10 cols.		
			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										

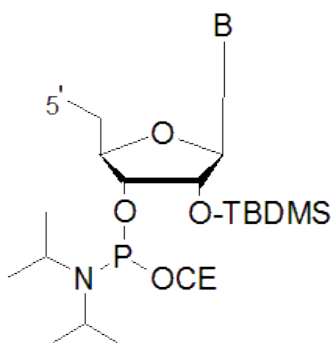
* Currently we are offering 2'-O-TBDMS-3'-Icaa CPG Products instead of 3'-O-TBDMS-2'-Icaa CPG

Please Indicate Synthesizer when Ordering

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

Oligo Synthesis Products

Phosphoramidites and Supports for Natural RNA Synthesis



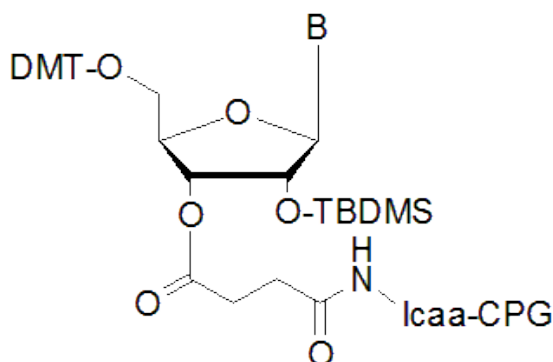
Amidites for Natural RNA Synthesis with N-PAC Base Protection

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.



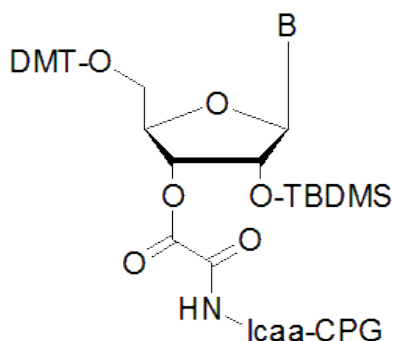
Natural RNA Supports with Labile Base Protection

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

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

Phosphoramidites and Supports for Natural RNA Synthesis



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

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

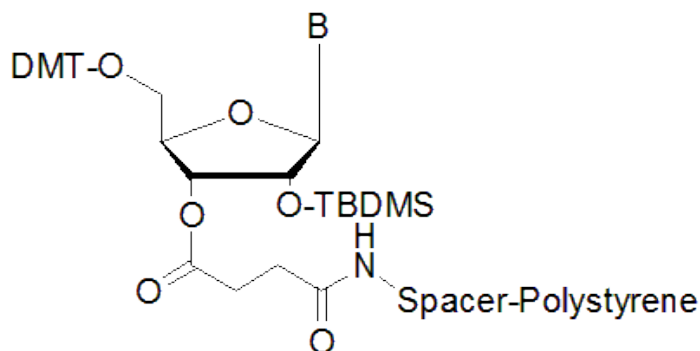
Catalog#	Pricing
RN-1435	\$35.00 / 25 ml

Please Indicate Synthesizer when Ordering

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

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 $\mu\text{m/gm}$			pack of 4 cols.			pack of 10 cols.		
				100 mg	1 gm	5 gm	40 nmole	.02 μmole	1.0 μmole	40 nmole	0.2 μmole	1.0 μmole
N-6111-05	Adenosine (N-Bz) 2'-O-TBDMS 3'-Diamido Polystyrene	300Å	60-70 microns	\$40	\$150	\$465	\$55	\$65	\$90	\$110	\$130	\$180
N-6112-05	Cytidine (N-Bz) 2'-O-TBDMS 3'-Diamido Polystyrene	300Å	60-70 microns	\$40	\$150	\$465	\$55	\$65	\$90	\$110	\$130	\$180
N-6113-05	Guanosine (N-iBu) 2'-O-TBDMS 3'-Diamido Polystyrene	300Å	60-70 microns	\$45	\$165	\$490	\$60	\$70	\$100	\$120	\$140	\$200
N-6114-05	Uridine 2'-O-TBDMS 3'-Diamido Polystyrene	300Å	60-70 microns	\$35	\$140	\$455	\$50	\$60	\$85	\$100	\$120	\$170
N-6116-05	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

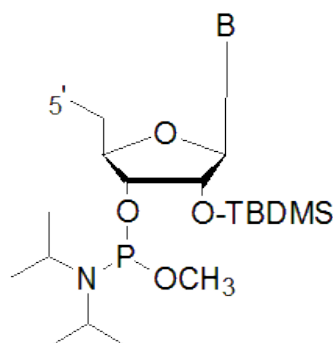
ChemGenes has developed unique polystyrene supports and columns that have special appeal due to rigidity, swelling, and inertness towards moisture and water. Our polystyrenes have a special linker and pore size (500Å). This unusual cross-linking nature matches very closely with CPG (500Å).

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

Please Indicate Synthesizer when Ordering

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

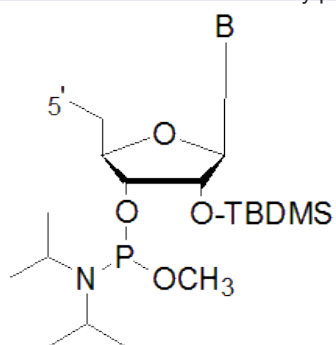
Phosphoramidites and Supports for Natural RNA Synthesis



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

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

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



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

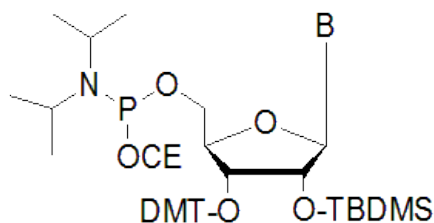
5'	B	Protection	Catalog#
O-DMT	A	<i>N</i> -PAC	ANP-3861
O-DMT	C	<i>N</i> -PAC	ANP-3862
O-DMT	G	<i>N</i> -PAC	ANP-3863
O-MMT	A	<i>N</i> -PAC	ANP-3866
O-MMT	G	<i>N</i> -PAC	ANP-3867

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

Oligo Synthesis Products

Phosphoramidites and Supports for Modified RNA Synthesis

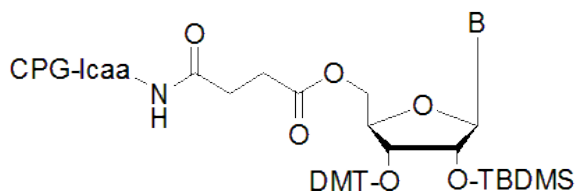


Amidites for Reverse RNA Synthesis with Standard Base Protection

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 Protection

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!

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

Phosphoramidites and Supports for Modified RNA Synthesis

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.

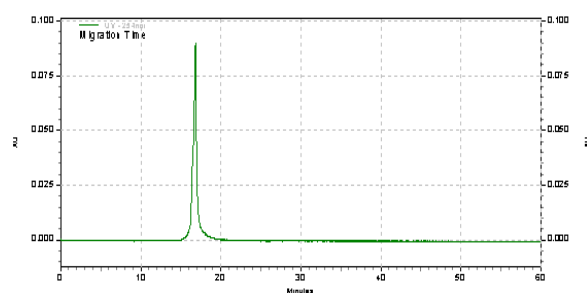


Figure 1. Capillary Gel Electrophoresis (CE) of 21- Mer RNA with 3'-Cholesterol-TEG linker. Reverse direction (5'→3') synthesis and HPLC purification. 1 umole scale. Purity; 99.9%.

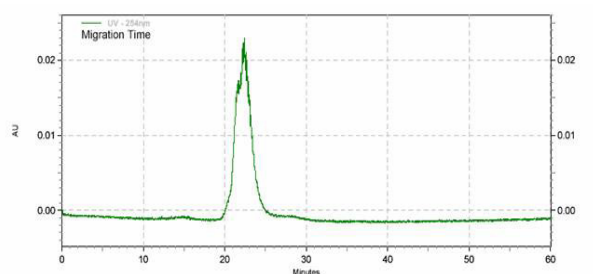


Figure 2a. Capillary Gel Electrophoresis (CE) of the HPLC purified 21- mer RNA with 3'- PEG(Poly ethyleneglycol; MW; 2000). Made by Reverse RNA synthesis method (5'→3'-direction). Expedite model 8909- 1 umole scale. Purity; 100%

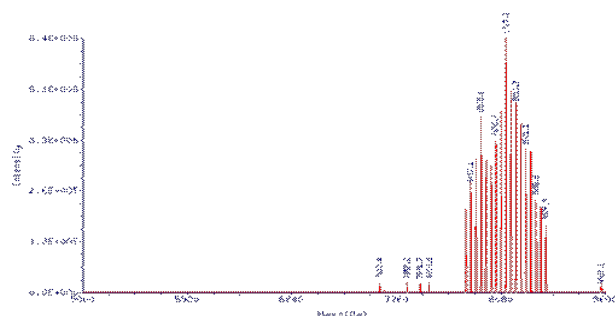


Figure. 2b. ESI Mass Spectral analysis of 21-mer RNA with 3'- PEG -2000 attachment, purified RNA as shown in Fig. 2a. The synthesis was carried out in reverse direction (5' → 3' direction). The PEG-2000 amidite (ChemGenes catalog ;CLP-3119) was attached as last step.

Mass Spectral analysis of the purified RNA:

Calculated Molecular Weight: 8684.1

Observed Molecular Weight: 8681.1

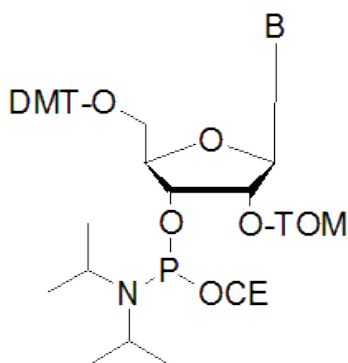
Note: There is a distribution of at least 14 PEG species of the RNA on both sides of the Calculated molecular weight with PEG-2000. Thus species from 8417.1 to 8945.3 are present with a molecular weight difference of a glycol unit (+/- 44).

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 .

Oligo Synthesis Products

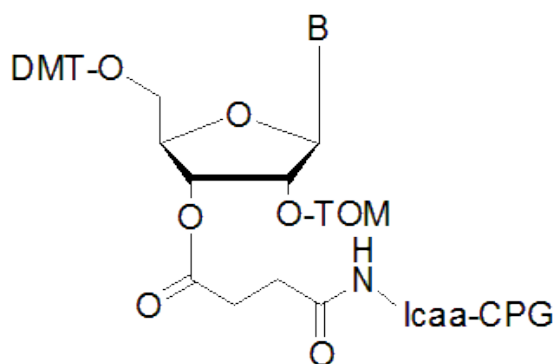
Phosphoramidites and Supports for Modified RNA Synthesis



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, <i>M.W. 998.23</i>	\$90	\$350	\$600	\$5000
ANP-3202	2'-TOM ribo Cytidine (N-Ac) 3'-CEP, <i>M.W. 974.18</i>	\$90	\$350	\$600	\$5000
ANP-3203	2'-TOM ribo Guanosine (N-Ac) 3'-CEP, <i>M.W. 1014.15</i>	\$90	\$350	\$600	\$5000
ANP-3205	2'-TOM ribo Uridine 3'-CEP, <i>M.W. 932.75</i>	\$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!

Catalog #	Product Name	Pore Size	Bulk CPG		pack of 4 cols.		pack of 10 cols.			
			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								

Phosphoramidites and Supports for Modified RNA Synthesis

Highlight of TOM-Amidites RNA Synthesis

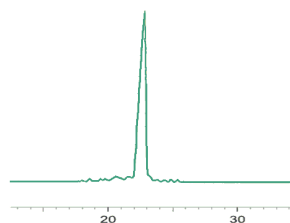
2'-Triisopropylsilyl-oxy methyl amidites Highly suitable for Large Scale Therapeutic Grade RNA Synthesis & Long RNA sequences, Aptamers Etc.

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 different 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 Oligonucleotides.
- 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 conditions and in significantly excess amount of water without side effects.
- No Formaldehyde 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 ($\text{CH}_2\text{-OH}$) 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 ($\text{CH}_2\text{-OH}$) 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. Because of nature of formaldehyde addition to pyrimidines (see Scheme below), pH 7.4 is recommended during desilylation step.

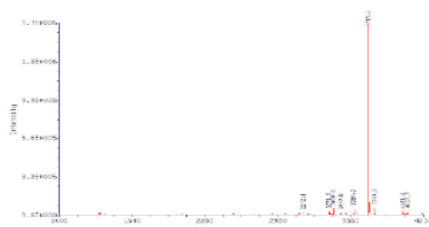
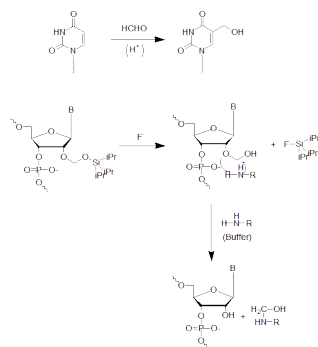


Fig. 1a: Shows correct and clean Mass. No M+30 or multiples of M+30 are seen.
Observed: MW: 3715.3
Target: MW: 3715.3

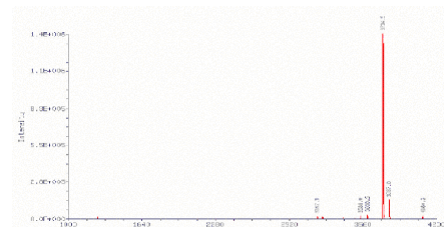


Fig. 1b: Shows correct and clean Mass. No M+30 or multiples of M+30 are seen.
Observed: MW: 3734.5
Target: MW: 3734.5

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.

Oligo Synthesis Products

Phosphoramidites and Supports for Modified RNA Synthesis

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

N³ Methyl & Thiobenzylethyl amidites

Includes N³- Methyl Uridine, N³-Methyl ribo Thymidine, & N³-Thiobenzoyl ethyl Uridine Amidites & Supports.

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

N⁶ Substituted Purine Amidites & Supports

Includes N⁶- Benzyl Adenosine and N⁶-isopentenyl Adenosine Amidites & Supports.

Puromycin CPG

N⁴-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

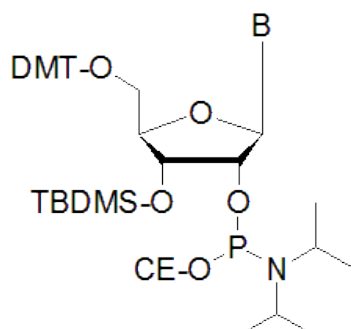
7-Deaza-7-Modified Amidites & Supports

isoC and isoG Amidites & Supports

2',3'- Diacetyl Guanosine & Uridine

L -RNA Amidites & Supports

Phosphoramidites and Supports for Modified RNA Synthesis



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, <i>M.W. 988.19</i>	\$85	\$160	\$280
ANP-5682	Cytidine (N-Bz) 3'-O-TBDMS 2'-CEP, <i>M.W. 964.17</i>	\$85	\$160	\$280
ANP-5683	Guanosine (N-iBu) 3'-O-TBDMS 2'-CEP, <i>M.W. 970.18</i>	\$85	\$160	\$280
ANP-5684	Uridine 3'-O-TBDMS 2'-CEP, <i>M.W. 861.05</i>	\$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. Pfeleiderer, 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. Jamouille, 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

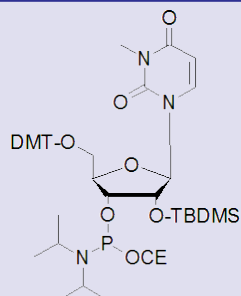
ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

Oligo Synthesis Products

Phosphoramidites and Supports for Modified RNA Synthesis

N³-Methyl Uridine CEP

(N³-Methyl-2'-O-TBDMS Uridine CEP)



C₄₆H₆₃N₄O₉PSi
Mol. Wt.: 875.07

Catalog#

ANP-7451

Pricing

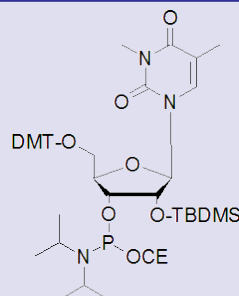
\$145.00 / 100 μmole

\$380.00 / 250 mg

Purity: 98% +

N³-Methyl ribo Thymidine CEP

(N³-Methyl-2'-O-TBDMS ribo Thymidine CEP)



C₄₇H₆₅N₄O₉PSi
Mol. Wt.: 889.10

Catalog#

ANP-7461

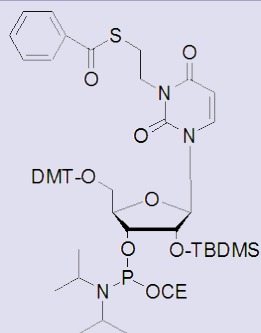
Pricing

\$180.00 / 100 μmole

\$450.00 / 250 mg

Purity: 98% +

N³-Thiobenzoyl ethyl Uridine CEP



C₅₄H₆₉N₄O₁₀PSSi
Mol. Wt.: 1025.27

Catalog#

ANP-7441

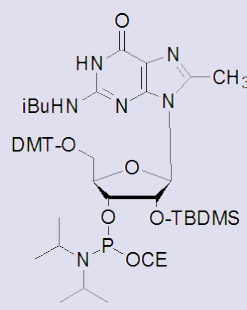
Pricing

\$280.00 / 100 μmole

\$615.00 / 250 mg

Purity: 98% +

8-Methyl ribo Guanosine CEP



C₅₁H₇₀N₇O₉PSi
Mol. Wt.: 984.20

Catalog#

ANP-6274

Pricing

\$305.00 / 100 μmole

\$685.00 / 250 mg

Purity: 99% +

N³ Substituted Pyrimidine Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG		pack of 4 cols.		pack of 10 cols.	
			100 mg	1 gm	0.2 μmole	1.0 μmole	0.2 μmole	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 -Thiobenzoyl ethyl Uridine	500Å	\$110	\$475	\$115	\$155	\$230	\$310
N-9828-10	2'-O-TBDMS 3'-Icaa CPG	1000Å						
N-9929-05	8-Methyl ribo Guanosine	500Å	\$75	\$475	\$90	\$120	\$180	\$240
N-9929-10	2'-O-TBDMS 3'-Icaa CPG	1000Å						

N³-methyl Uridine and N³-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*).

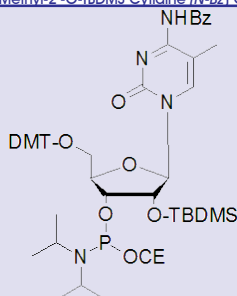
The individual alkylation products are thought to possess different mutagenic and carcinogenic properties (*Nucl. Acids Res., 20, 6471, 1992*).

N³-methyl Uridine phosphoramidite and N³-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.

Phosphoramidites and Supports for Modified RNA Synthesis

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

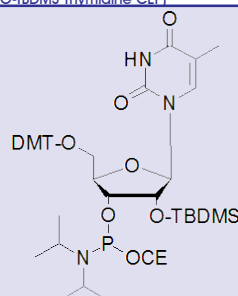
\$120.00 / 100 μ mole

\$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

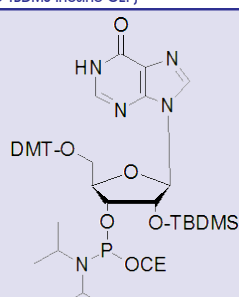
\$185.00 / 100 μ mole

\$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

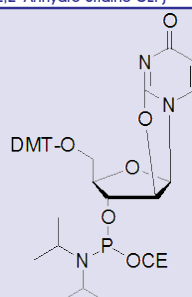
\$120.00 / 500 mg

\$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 μ mole

\$485.00 / 250 mg

Purity: 98% +

2'-Succinyl Icaa Supports & Columns

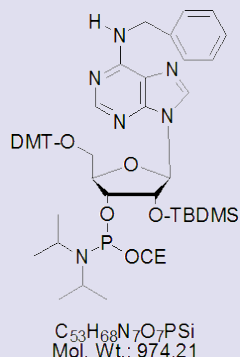
Catalog #	Product Name	Pore Size	Bulk CPG		pack of 4 cols.		pack of 10 cols.	
			100 mg	1 gm	0.2 μ mole	1.0 μ mole	0.2 μ mole	1.0 μ mole
N-9822-05	5-Methyl Cytidine (N-Bz)	500Å	\$ 60	\$475	\$75	\$110	\$150	\$210
N-9822-10	2'-O-TBDMS 3'-Icaa CPG	1000Å						
N-8477-05	Ribo Thymidine	500Å	\$110	\$545	\$75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

Oligo Synthesis Products

Phosphoramidites and Supports for Modified RNA Synthesis

N⁶-Benzyl Adenosine CEP

(N⁶-Benzyl-2'-O-TBDMS Adenosine CEP)



Catalog#

ANP-8614

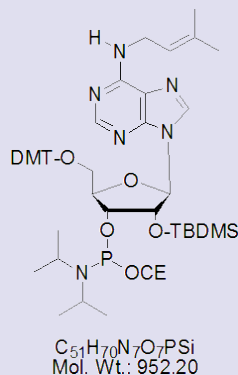
Pricing

\$365.00 / 100 μ mole

Purity: 98% +

N⁶-isopentenyl Adenosine CEP

(N⁶-isopentenyl-2'-O-TBDMS Adenosine CEP)



Catalog#

ANP-8615

Pricing

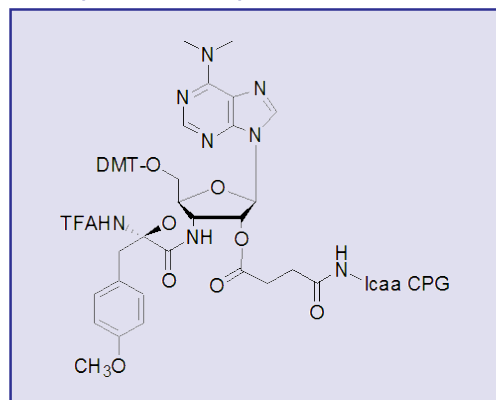
\$365.00 / 100 μ mole

Purity: 98% +

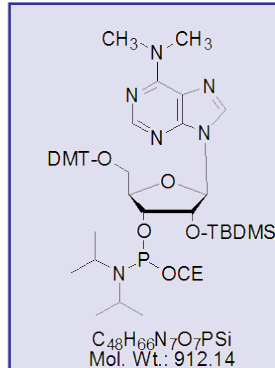
N⁶-Substituted Pyrimidine Supports & Columns

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

Puromycin 2'-succinyl Icaa CPG



N⁶,N⁶-Dimethyl-Adenosine-2'-TBDMS-3'-CEP



Catalog#

ANP-8626

Pricing

\$365.00 / 100 μ mole

Purity: 98% +

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

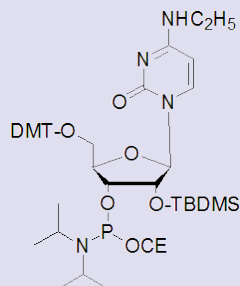
Please Indicate Synthesizer when Ordering

ABI ABI 3900 Expedite MerMade PolyPlex
AB30 AB39 EX MR PX

Phosphoramidites and Supports for Modified RNA Synthesis

N⁴-Ethyl Cytidine CEP

(N⁴-Ethyl 2'-O-TBDMS Cytidine CEP)



C₄₇H₆₆N₅O₈PSi
Mol. Wt.: 888.12

Catalog#

ANP-4165

Pricing

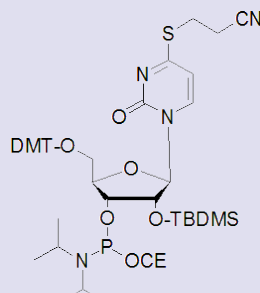
\$265.00 / 100 μmole

\$455.00 / 250 mg

Purity: 98% +

4-Thio Uridine CEP

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



C₄₈H₆₄N₅O₈PSSi
Mol. Wt.: 930.18

Catalog#

ANP-8101

Pricing

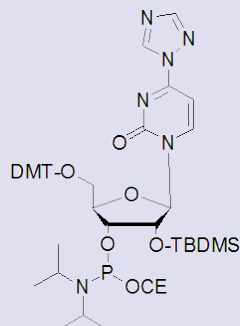
\$350.00 / 100 μmole

\$600.00 / 250 mg

Purity: 98% +

4-Triazolyl Uridine CEP

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



C₄₇H₆₂N₇O₈PSi
Mol. Wt.: 912.10

Catalog#

ANP-9167

Pricing

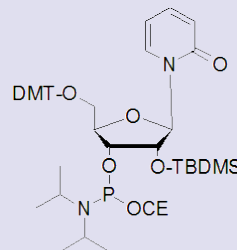
\$255.00 / 100 μmole

\$480.00 / 250 mg

Purity: 98% +

Pyridine-2-One CEP

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



C₄₆H₆₂N₃O₈PSi
Mol. Wt.: 844.06

Catalog#

ANP-8611

Pricing

\$280.00 / 100 μmole

\$665.00 / 250 mg

Purity: 98% +

3'-Succinyl Icaa Supports & Columns

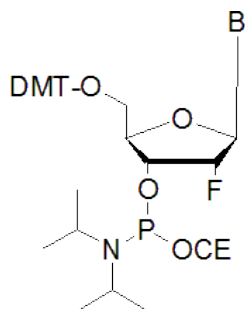
Catalog #	Product Name	Pore Size	Bulk CPG		pack of 4 cols.		pack of 10 cols.	
			100 mg	1 gm	0.2 μmole	1.0 μmole	0.2 μmole	1.0 μmole
N-9020-05	Pyridine-2-One	500Å	\$105	\$685	\$95	\$145	\$190	\$290
N-9020-10	2'-O-TBDMS 3'-Icaa CPG	1000Å						
N-9824-05	N ⁴ -Ethyl Cytidine	500Å	\$ 60	\$525	\$85	\$125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

Please Indicate Synthesizer when Ordering

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

Oligo Synthesis Products

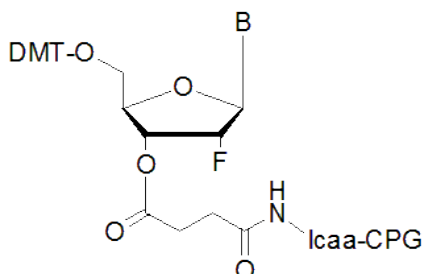
Phosphoramidites and Supports for Modified RNA Synthesis



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, <i>M.W. 875.92</i>	\$75	\$135	\$245	\$435	\$505
ANP-9157 NEW!	2'-Fluoro deoxy Adenosine (N,N-DMF) 3'-CEP, <i>M.W. 826.90</i>	\$85	\$155	\$300	\$580	\$1,380
ANP-9152	2'-Fluoro deoxy Cytidine (N-Ac) 3'-CEP, <i>M.W. 789.83</i>	\$55	\$95	\$190	\$575	\$750
ANP-9153 NEW!	2'-Fluoro deoxy Guanosine (N-iBu) 3'-CEP, <i>M.W. 857.91</i>	\$75	\$135	\$245	\$435	\$505
ANP-9159 NEW!	2'-Fluoro deoxy Guanosine (N,N-DMF) 3'-CEP, <i>M.W. 842.89</i>	\$85	\$155	\$300	\$580	\$1,380
ANP-9154	2'-Fluoro deoxy Uridine 3'-CEP, <i>M.W. 748.78</i>	\$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-1059 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		pack of 4 cols.		pack of 10 cols.	
			100 mg		0.2 μmole	1.0 μmole	0.2 μmole	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-1059-05	2'-Fluoro deoxy Guanosine (N-iBu)	500Å	\$110		\$145	\$165	\$295	\$365
N-1059-10	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						

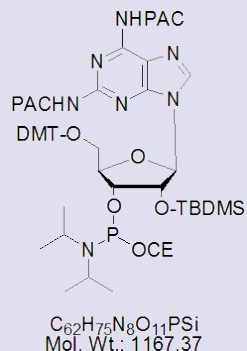
2'-Fluoro nucleoside phosphoramidites:

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).

Phosphoramidites and Supports for Modified RNA Synthesis

2,6-Diaminopurine-CEP

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



Catalog#

ANP-8613

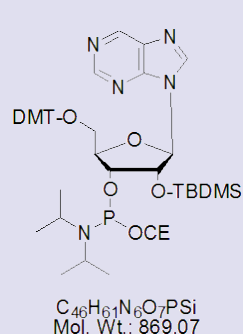
Pricing

\$325.00 / 100 μ mole

Purity: 98% +

Purine Riboside CEP

(2'-O-TBDMS Purine Riboside CEP)



Catalog#

ANP-8616

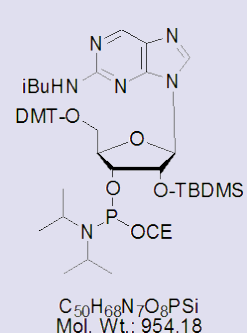
Pricing

\$385.00 / 100 μ mole

Purity: 98% +

2-Amino Purine Riboside CEP

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



Catalog#

ANP-8617

Pricing

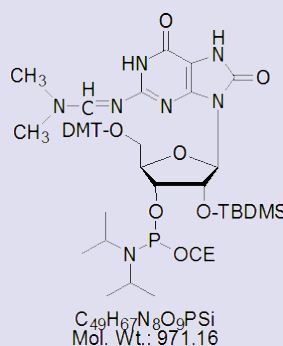
\$370.00 / 100 μ mole

Purity: 98% +

8-Oxo ribo Guanosine CEP

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

NEW!



Catalog#

ANP-9420

Pricing

\$285.00 / 100 μ mole

\$800.00 / 250 mg

Purity: 99% +

2'-Succinyl Icaa Supports & Columns

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

Please Indicate Synthesizer when Ordering

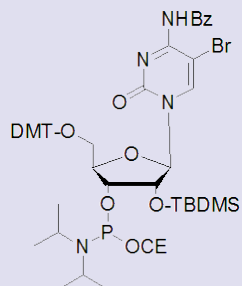
ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

Oligo Synthesis Products

Phosphoramidites and Supports for Modified RNA Synthesis

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 μ mole

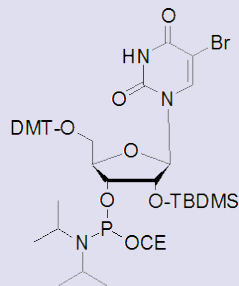
\$330.00 / 250 mg

\$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

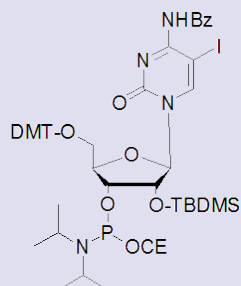
\$155.00 / 100 μ mole

\$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

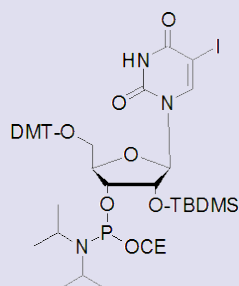
\$155.00 / 100 μ mole

\$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

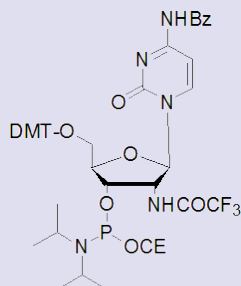
\$155.00 / 100 μ mole

\$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

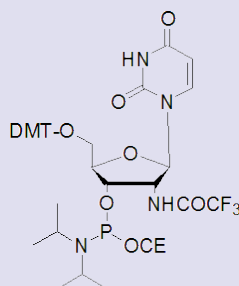
\$250.00 / 100 μ mole

\$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 μ mole

\$428.00 / 250 mg

Purity: 98% +

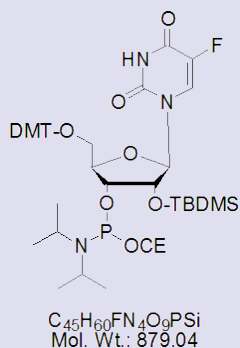
Succinyl Icaa Supports & Columns

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

Phosphoramidites and Supports for Modified RNA Synthesis

5-Fluoro Uridine CEP

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



Catalog#

ANP-6154

Pricing

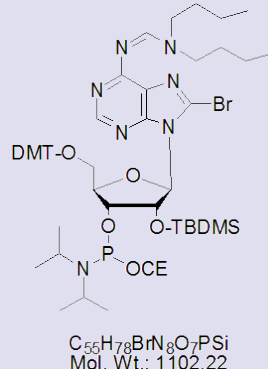
\$255.00 / 100 μ mole

\$480.00 / 250 mg

Purity: 98% +

8-Bromo Adenosine CEP

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



Catalog#

ANP-7111

Pricing

\$115.00 / 100 μ mole

\$235.00 / 250 mg

Purity: 98% +

Halogenated Purines & Pyrimidines Supports Columns

Catalog #	Product Name	Pore Size	Bulk CPG		pack of 4 cols.		pack of 10 cols.	
			100 mg	1 gm	0.2 μ mole	1.0 μ mole	0.2 μ mole	1.0 μ mole
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						

Please Indicate Synthesizer when Ordering

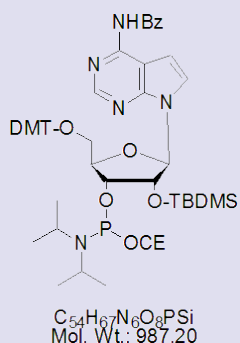
ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

Oligo Synthesis Products

Phosphoramidites and Supports for Modified RNA Synthesis

7-Deaza Adenosine CEP

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



Catalog#

ANP-7101

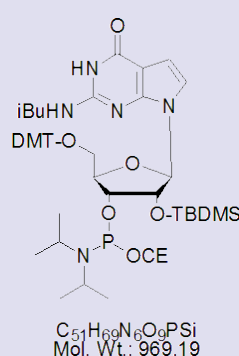
Pricing

\$315.00 / 100 μ mole

Purity: 98% +

7-Deaza Guanosine CEP

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



Catalog#

ANP-7301

Pricing

\$355.00 / 100 μ mole

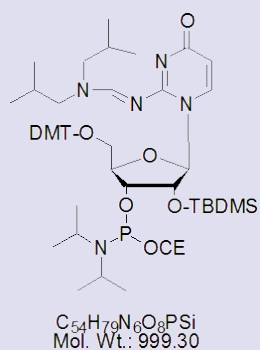
Purity: 98% +

7-Deaza 2'-Succinyl Icaa Supports & Columns

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

isoCytidine CEP

(isoCytidine (N,N-DiBf) CEP)



Catalog#

ANP-7715

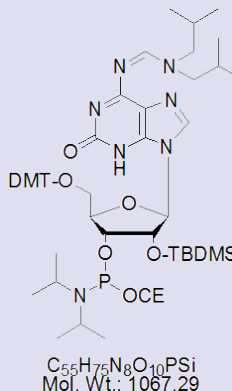
Pricing

\$370.00 / 100 μ mole

Purity: 98% +

isoGuanosine CEP

(isoGuanosine (N,N-DiBf) CEP)



Catalog#

ANP-5988

Pricing

\$370.00 / 100 μ mole

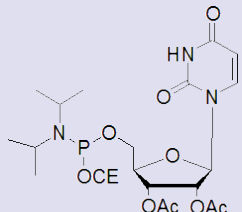
Purity: 98% +

isoC & isoG 2'-Succinyl Icaa Supports & Columns

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

Phosphoramidites and Supports for Modified RNA Synthesis

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



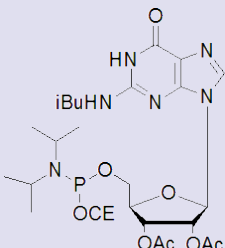
Catalog#
ANP-6155

Pricing
\$80.00 / 100 μmole
\$175.00 / 250 mg

Purity: 98% +

Chemical Formula: C₂₂H₃₃N₄O₉P
Mol. Wt.: 528.49

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



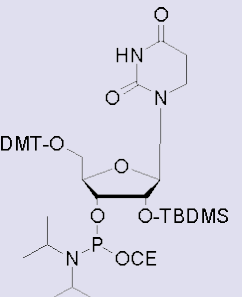
Catalog#
ANP-6156

Pricing
\$90.00 / 100 μmole
\$190.00 / 250 mg

Purity: 98% +

Chemical Formula: C₂₇H₄₀N₇O₉P
Mol. Wt.: 637.62

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



Catalog#
ANP-6066

Pricing
\$80.00 / 100 μmole
\$175.00 / 250 mg

Purity: 98% +

Chemical Formula: C₄₅H₈₇N₄O₉PSi
Mol. Wt.: 861.05

Dihydrouridine Phosphoramidite

Dihydrouridine, along with a large number of other modified nucleosides are present abundantly in tRNA, mRNA, shRNA, rRNA and other RNAs¹. The catabolic degradation of uridine or the uracil moiety leads to dihydrouridine and enzyme dihydropyrimidine dehydrogenase is involved². 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.

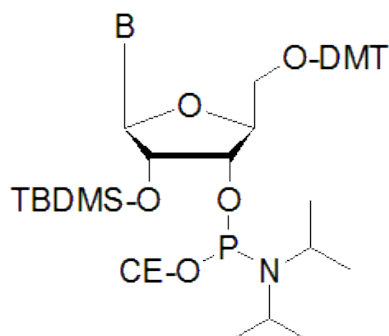
Periodate cleavage of these diols generates dialdehydes (*N. F. Krynetskaya, G. V. Zayakina, T. S. Oretskaya, E. M. Volkov, Z. A. Shabarova, Nucleo. Nucleot.*, 5, 33, 1986). These dialdehydes have been stabilized by amines, especially by terminal amino groups of lysine residue of proteins or polypeptides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

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



β -L-RNA Phosphoramidites

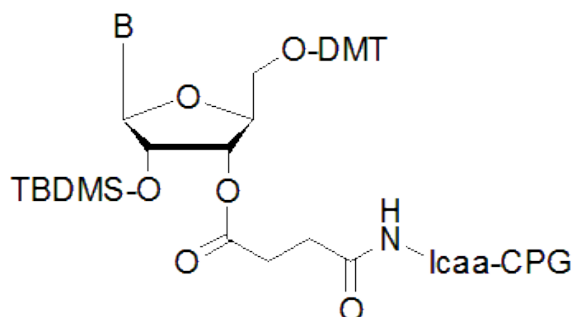
5'	B	Protection	Catalog#
O-DMT	A	N-Bz	ANP-4841
O-DMT	C	N-Bz	ANP-4842
O-DMT	G	N-iBu	ANP-4843
O-DMT	T	n/a	ANP-4844
O-DMT	U	n/a	ANP-4845
O-DMT	C	N-Ac	ANP-4846

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

Please Indicate Synthesizer when Ordering _____

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

Phosphoramidites and Supports for Modified RNA Synthesis



β -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			pack of 4 cols.		pack of 10 cols.	
			100 mg	500 mg	1 gm	0.2 μ mole	1.0 μ mole	0.2 μ mole	1.0 μ mole
N-4691-05	β -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	β -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	β -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	β -L-Uridine	500Å	\$135	\$425	\$850	\$110	\$125	\$220	\$250
N-4694-10	2'-O-TBDMS-3'-Icaa CPG	1000Å							
N-4695-05	β -L-ribo Thymidine	500Å	\$135	\$425	\$850	\$110	\$125	\$220	\$250
N-4695-10	2'-O-TBDMS-3'-Icaa CPG	1000Å							
N-4696-05	β -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

Please Indicate Synthesizer when Ordering _____

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

Oligo Synthesis Products

RNA Purification

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 precipitated 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 et al, NAR, 2000), (b) ChemGenes Cartridges (CSS-5232), (c) NAP25 columns. After desalting the desired fractions are converted into sodium salt with sodium perchlorate.

RNA Purification

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 weight in absolute ethanol)

NH₃ F.W.: 17

C₂H₆O. F.W.: 46.07

Catalog #	Quantity	Prices
CSS-3268	10 ml	\$35.00

Ideal for selective deprotection of the base protecting groups and the cyanoethyl groups and preventing chain cleavage isomerization of 3'-5' phosphodiester bond in the final RNA.
(ref: Taifeng Wu, Kelvin K. Ogilvie, 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 separation of different length oligos is based on charges on the ion-exchange media in the cartridges. They achieve excellent purification of the oligonucleotide.

Tetra Butyl Ammonium Fluoride(TBAF)

(1M Solution in Tetrahydrofuran)

C₁₆H₃₈FN

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 by products after tetra butyl ammonium fluoride step in RNA deprotection.

Oligo Synthesis Products

Phosphoramidites and Supports for Introducing Chromophores & Ligands

Chromophores & Ligands

ChemGenes offers a variety of chromophores 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

1. Connolly, B. A. *Nucl. Acid Res.* **1987**, *15*, 3131-3139.
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Phosphoramidites and Supports for Introducing Chromophores & Ligands

Summary of Chromophore & Ligand Modified Phosphoramidites

The incorporation of the chromophores and ligands 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

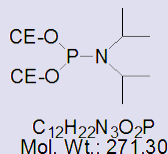
Includes *N4* 6-TAMRA Amidites and Support & 5-TAMRA Amidite

Oligo Synthesis Products

Phosphoramidites and Supports for Introducing Chromophores & Ligands

5'- Phosphorylation

(Bis-cyanoethyl-N,N-diisopropyl CEP)



Catalog#

CLP-1454

Pricing

\$ 40.00 / 100 μ mole

\$ 50.00 / 250 mg

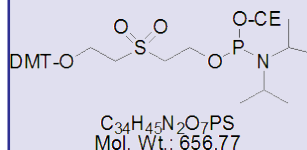
\$ 65.00 / 500 mg

\$110.00 / 1 gm

Purity: 98% +

5-Phosphorylation (generates DMT color)

(5-Phosphate-ON Reagent)



Catalog#

CLP-1544

Pricing

\$ 45.00 / 100 μ mole

\$150.00 / 250 mg

Purity: 98% +

Phosphate-ON Succinyl Icaa Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG		pack of 4 cols.		pack of 10 cols.	
			100 mg	1 gm	0.2 μ mole	1.0 μ mole	0.2 μ mole	1.0 μ mole
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 phosphorylated DNA or RNA oligomers in large quantities

5-Phosphate-ON-reagent is an alternative to Bis-cyanoethyl phosphorylating reagent, outlined above.

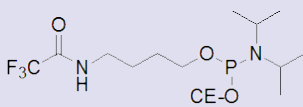
This reagent generates DMT orange color after introduction of phosphate at the last nucleoside in the oligonucleotide chain.

Please Indicate Synthesizer when Ordering

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

Phosphoramidites and Supports for Introducing Chromophores & Ligands

TFA-Amino C-4 CEP

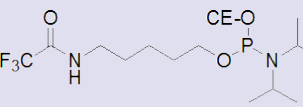


$C_{15}H_{27}F_3N_3O_3P$
 Mol. Wt.: 385.36

Catalog#
CLP-1453

Pricing
 \$ 48.00 / 100 μ mole
 \$150.00 / 250 mg
Purity: 98% +

TFA-Amino C-5 CEP

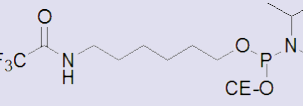


$C_{16}H_{29}F_3N_3O_3P$
 Mol. Wt.: 399.39

Catalog#
CLP-1357

Pricing
 \$30.00 / 100 μ mole
 \$90.00 / 250 mg
Purity: 98% +

TFA-Amino C-6 CEP



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

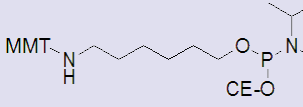
Catalog#
CLP-1553

Pricing
 \$30.00 / 100 μ mole
 \$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



$C_{35}H_{49}N_3O_3P$
 Mol. Wt.: 589.75

Catalog#
CLP-1563

Pricing
 \$ 60.00 / 100 μ mole
 \$175.00 / 250 mg
Purity: 98% +

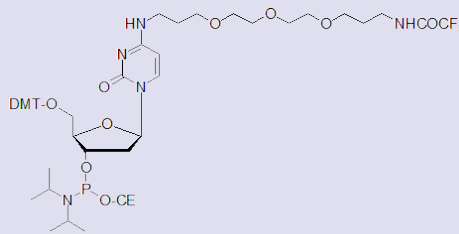
Please Indicate Synthesizer when Ordering

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

Oligo Synthesis Products

Phosphoramidites and Supports for Introducing Chromophores & Ligands

deoxy Cytidine N⁴ Amino Linker CEP



$C_{51}H_{68}F_3N_6O_{11}P$
Mol. Wt.: 1029.09

Catalog#
CLP-1329

Pricing
\$115.00 / 100 μ mole
\$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*).

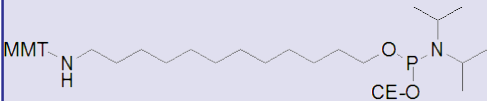
The 5'-Terminal Amino Introducing Reagent with C-4 Spacer (TFA-amino C-4, Catalog # CLP-1453) allows only for a single primary amino function per molecule. The amino group is introduced while protected as trifluoroacetamido which is cleaved during ammonia deprotection of the oligo. The amino group is 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 similarly introduced as the trifluoroacetamido 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

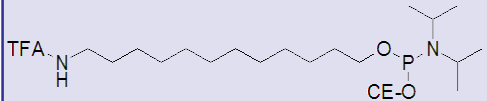
ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

Phosphoramidites and Supports for Introducing Chromophores & Ligands

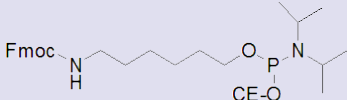
MMT-Amino C-12 CEP

 $C_{41}H_{60}N_3O_3P$ Mol. Wt.: 673.91	Catalog#
	CLP-1585
	Pricing
	\$90.00 / 100 μ mole \$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 μ mole \$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 μ mole \$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, catalog #: 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% trichloroacetic acid (TCA), similar to DMT removal in oligonucleotide synthesis. However, the MMT-group removal is significantly slower (12 minutes contact with TCA).

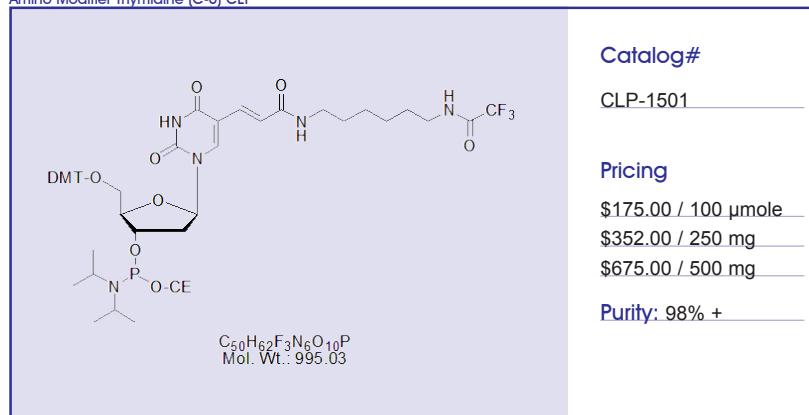
A useful utilization of MMT protected C-6 and C-12 phosphoramidites involves the selective cleavage of the MMT group from the synthesized oligonucleotide to obtain the free terminal amino function while the oligo is still bound to the solid support. Various chromophores can be coupled to the terminal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

Oligo Synthesis Products

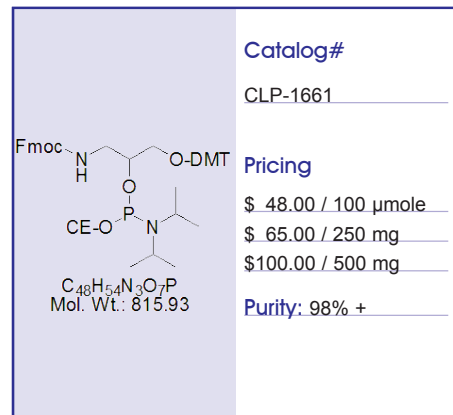
Phosphoramidites and Supports for Introducing Chromophores & Ligands

Amino-dT (C-6)

Amino Modifier Thymidine (C-6) CEP



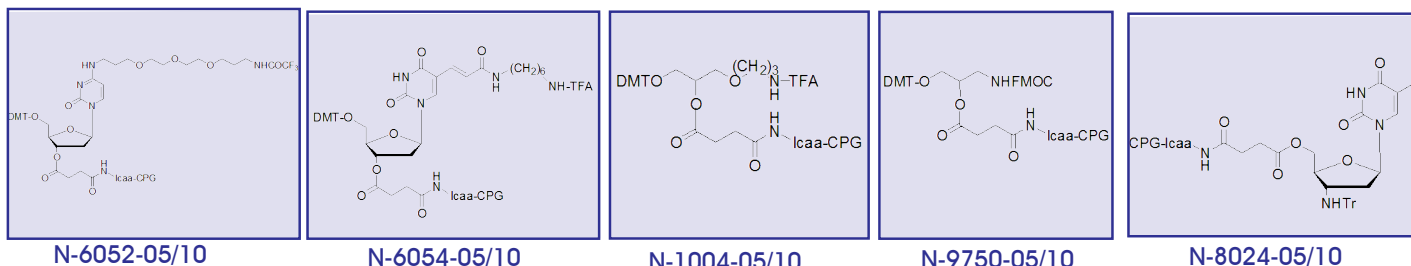
Fmoc-Amino-DMT C-3 CEP



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 addition 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



Supports & Columns for 3'-amino linker oligonucleotides

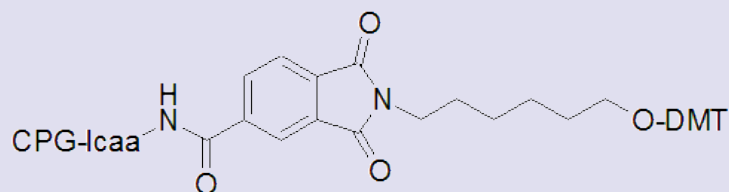
Catalog #	Product Name	Pore Size	Bulk CPG			pack of 4 cols.		pack of 10 cols.	
			100	250	1	0.2	1.0	0.2	1.0
			mg	mg	gm	μ mole	μ mole	μ mole	μ mole
N-1004-05	TFA Amino C-6	500Å	\$140	\$180	\$585	\$120	\$180	\$240	\$360
N-1004-10	Icaa CPG	1000Å							
N-9750-05	3'-Amino Modifier C-3	500Å	\$140	\$150	\$550	\$88	\$112	\$176	\$224
N-9750-10	Icaa CPG	1000Å							
N-6052-05	deoxy Cytidine <i>N</i> 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 Modifier 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).

Phosphoramidites and Supports for Introducing Chromophores & Ligands

3'-Amino-Phtalamido Modifier CPG



Supports & Columns for 3'-amino linker oligonucleotides

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

Please Indicate Synthesizer when Ordering _____

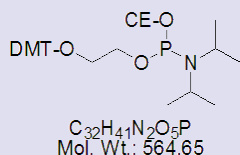
ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

Oligo Synthesis Products

Phosphoramidites and Supports for Introducing Chromophores & Ligands

DMT-Ethane-Diol Phosphoramidite

(C-2 Spacer)



Catalog#

CLP-2250

Pricing

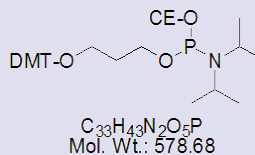
\$ 80.00 / 100 μ mole

\$150.00 / 250 mg

Purity: 98% +

DMT-Propane-Diol Phosphoramidite

(C-3 Spacer)



Catalog#

CLP-9908

Pricing

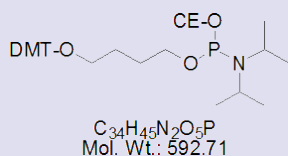
\$ 80.00 / 100 μ mole

\$150.00 / 250 mg

Purity: 98% +

DMT-Butane-Diol Phosphoramidite

(C-4 Spacer)



Catalog#

CLP-9775

Pricing

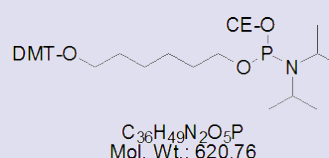
\$ 80.00 / 100 μ mole

\$150.00 / 250 mg

Purity: 98% +

DMT-Hexane-Diol Phosphoramidite

(C-6 Spacer)



Catalog#

CLP-1120

Pricing

\$ 80.00 / 100 μ mole

\$150.00 / 250 mg

Purity: 98% +

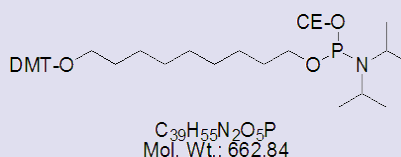
The DMT-butanol CEP phosphoramidite (catalog #: CLP-9775) introduces the butanediol moiety (single or multiple units) into an oligonucleotide.

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 Phosphoramidite

(C-9 Spacer)



Catalog#

CLP-9009

Pricing

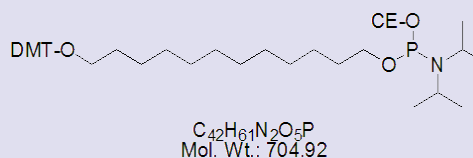
\$ 80.00 / 100 μ mole

\$150.00 / 250 mg

Purity: 98% +

DMT-Dodecane-Diol Phosphoramidite

(C-12 Spacer)



Catalog#

CLP-1114

Pricing

\$ 80.00 / 100 μ mole

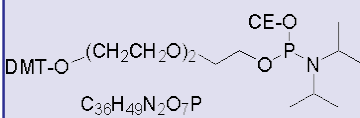
\$150.00 / 250 mg

Purity: 98% +

Phosphoramidites and Supports for Introducing Chromophores & Ligands

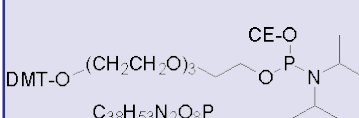
DMT-Triethyloxy-Glycol Phosphoramidite

(Spacer 9)

 $C_{36}H_{49}N_2O_7P$ Mol. Wt.: 652.76	Catalog#
	CLP-1113
	Pricing
	\$ 80.00 / 100 μ mole \$150.00 / 250 mg Purity: 98% +

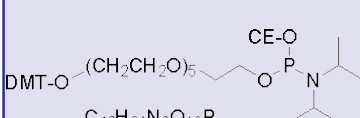
DMT-Tetraethyloxy-Glycol Phosphoramidite

(Spacer 12)

 $C_{38}H_{53}N_2O_8P$ Mol. Wt.: 696.81	Catalog#
	CLP-1368
	Pricing
	\$ 80.00 / 100 μ mole \$150.00 / 250 mg Purity: 98% +

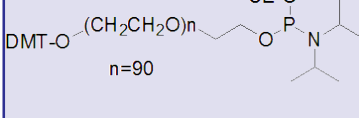
DMT-Hexa-Ethyloxy-Glycol Phosphoramidite

(Spacer 18)

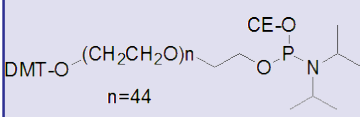
 $C_{42}H_{61}N_2O_{10}P$ Mol. Wt.: 784.91	Catalog#
	CLP-9765
	Pricing
	\$ 80.00 / 250 mg \$150.00 / 500 mg Purity: 98% +

Polyethyleneglycol 4500 CEP

(Avg. M.W. ~4500)

 n=90 Mol. Wt. Avg: ~4500	Catalog#
	CLP-3118
	Pricing
	\$275.00 / 100 μ mole \$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 μ mole \$580.00 / 250 mg Purity: 98% +

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

For Glyceryl CPG and Butyl CPG please see page 81.

Oligo Synthesis Products

Phosphoramidites and Supports for Introducing Chromophores & Ligands

5'-Thiol C-6 Disulfide Modifier CEP

$C_{42}H_{61}N_2O_5PS_2$
 Mol. Wt.: 769.05

Catalog#
CLP-8506

Pricing
 \$126.00 / 100 μ mole
 \$320.00 / 250 mg

Purity: 98% +

5'-Thiol Modifier Hexyl-6-CEP

$C_{34}H_{45}N_2O_5PS$
 Mol. Wt.: 576.87

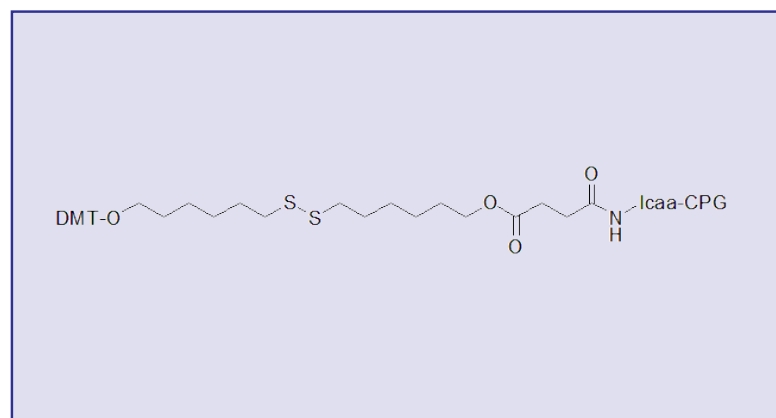
Catalog#
CLP-5888

Pricing
 \$ 60.00 / 100 μ mole
 \$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

$C_{39}H_{46}N_5O_5PS$
 Mol. Wt.: 727.85

Catalog#
CLP-8509

Pricing
 \$155.00 / 100 μ mole
 \$335.00 / 250 mg

Purity: 98% +

3'-Thiol Succinyl Icaa Supports & Columns

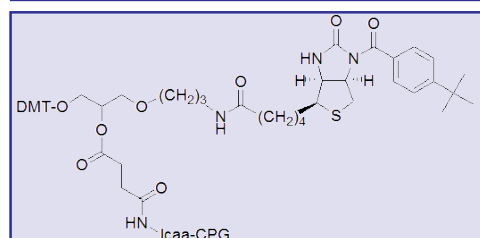
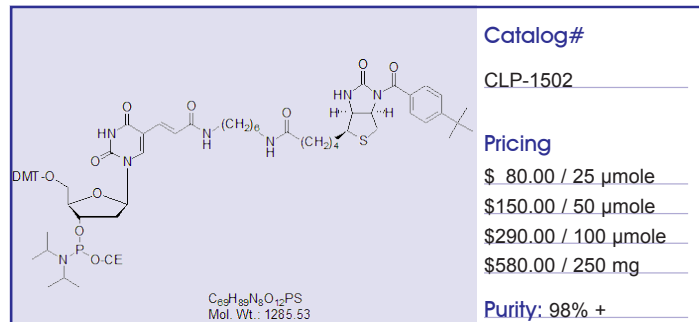
Catalog #	Product Name	Pore Size	Bulk CPG		pack of 4 cols.		pack of 10 cols.	
			100 mg	1 gm	0.2 μ mole	1.0 μ mole	0.2 μ mole	1.0 μ mole
N-9987-05	3'-Thiol Modifier	500Å	\$70	\$530	\$68	\$110	\$136	\$220
N-9987-10	C-6 Disulfide Icaa CPG	1000Å						

Please Indicate Synthesizer when Ordering _____

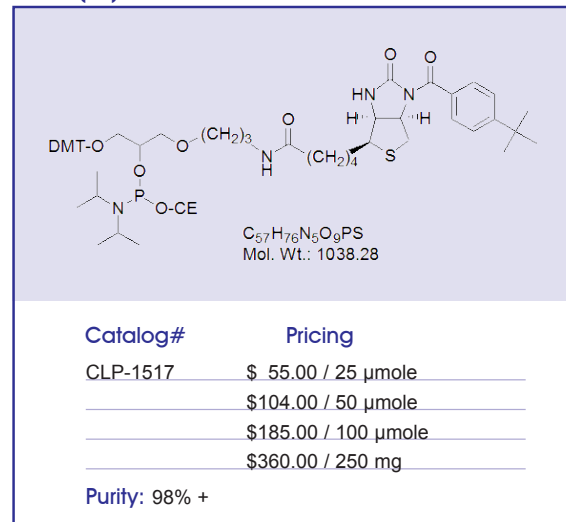
ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

Phosphoramidites and Supports for Introducing Chromophores & Ligands

Biotin dT CEP



Biotin (BB)TM CEP



Catalog #	Product Name	Pore Size	Bulk CPG		pack of 4 cols.		pack of 10 cols.	
			100 mg	1 gm	0.2 μ mole	1.0 μ mole	0.2 μ mole	1.0 μ mole
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 achieved 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)TM 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 Piesles, 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(+).

Oligo Synthesis Products

Phosphoramidites and Supports for Introducing Chromophores & Ligands

Symmetrical Branching CEP

C₅₄H₈₁N₂O₈P
Mol. Wt.: 897.04

Catalog#
CLP-5215 _____

Pricing
\$ 90.00 / 100 μ mole _____
\$198.00 / 250 mg _____
Purity: 98% + _____

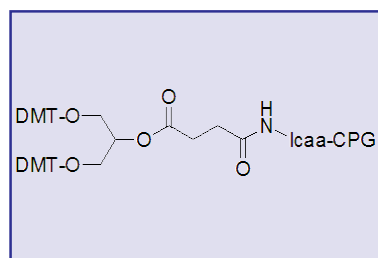
Asymmetrical Branching CEP

C₃₈H₄₉N₂O₈P
Mol. Wt.: 692.78

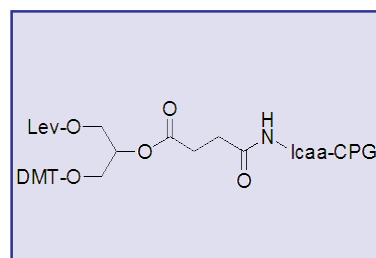
Catalog#
CLP-7169 _____

Pricing
\$110.00 / 100 μ mole _____
\$235.00 / 250 mg _____
Purity: 98% + _____

Symmetrical Branching Support



Asymmetrical Branching Support



Catalog #	Product Name	Pore Size	Bulk CPG		pack of 4 cols.		pack of 10 cols.	
			100 mg	1 gm	0.2 μ mole	1.0 μ mole	0.2 μ mole	1.0 μ mole
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-7170-05	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 oligonucleotide via automated DNA synthesis directly. Branched oligonucleotides are synthesized from the incorporated glycerol backbone, which possesses 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 fluorescein, 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 glycerol 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.

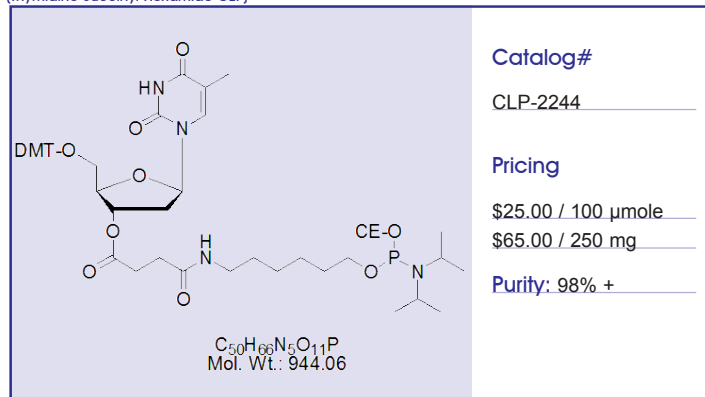
Levulinyl Deprotection Solution

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

Phosphoramidites and Supports for Introducing Chromophores & Ligands

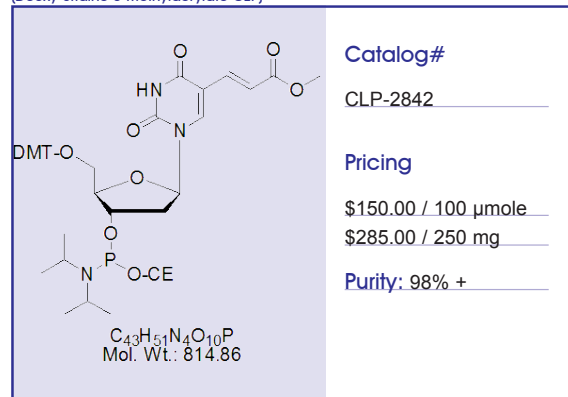
5'-Carboxyl Group Generating Reagent

(Thymidine-Succinyl Hexamide CEP)



C-5 Carboxy Introducing Amidite

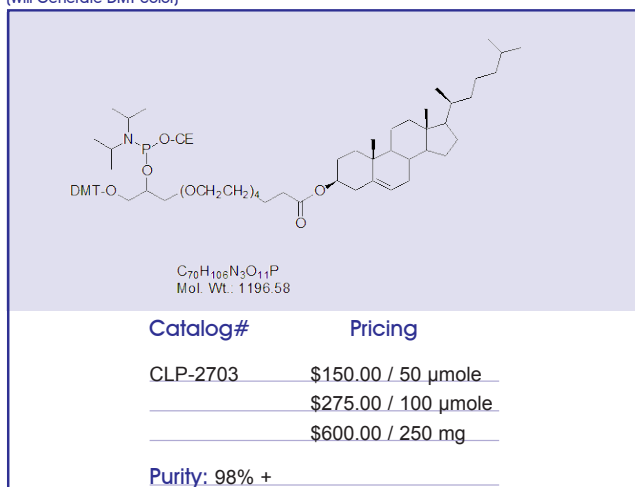
(Deoxy Uridine 5-Methylacrylate CEP)



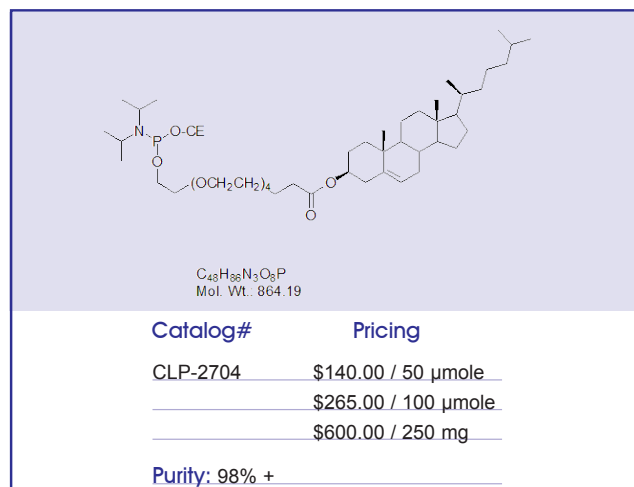
For oligos requiring a 5'-carboxylic group, this is an excellent reagent. This ligand is introduced to the oligo via attachment to a C-6 spacer at the 5'-end of the DNA or RNA oligo.

Cholesterol (TEG) CEP

(Will Generate DMT color)



TEG Cholesterol (Tetra Ethylene Glycol) CEP



Cholesterol Supports & Columns

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

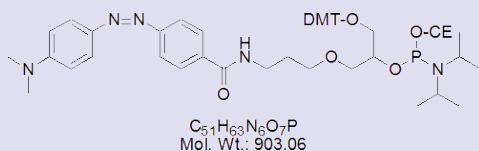
Cholesterol TEG phosphoramidite and solid supports:

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 cholesterol oligos and the consequent improvement in activity has been described. Cholesterol phosphoramidite is designed with branched triethyleneglycol (TEG) spacer for maximum solubility in acetonitrile as well as for applications requiring multiple labels.

Oligo Synthesis Products

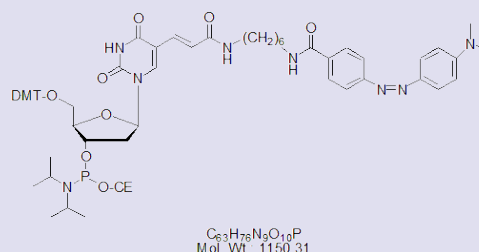
Phosphoramidites and Supports for Introducing Chromophores & Ligands

Dabcyl CEP



Catalog#	Pricing
CLP-1522	\$110.00 / 50 μ mole
	\$175.00 / 100 μ mole
	\$350.00 / 250 mg
Purity: 98% +	

Thymidine C-5 Dabcyl CEP



Catalog#	Pricing
CLP-9906	\$150.00 / 50 μ mole
	\$285.00 / 100 μ mole
	\$500.00 / 250 mg
Purity: 98% +	

Dabcyl phosphoramidites and solid supports:

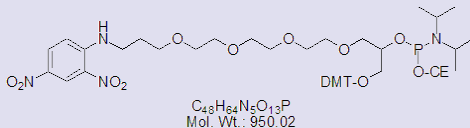
A molecular beacon probe has its natural fluorescence quenched in solution unless it is hybridized to the target sequence. Consequently, the design of a molecular beacon requires a fluorophore to be in one part of the sequence and the quencher molecule to be in another, with both molecules being separated 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		pack of 4 cols.		pack of 10 cols.	
			100 mg	1 gm	0.2 μ mole	1.0 μ mole	0.2 μ mole	1.0 μ mole
N-9756-05	Dabcyl-Icaa-CPG	500Å	\$110	\$940	\$110	\$175	\$220	\$350

DNP-TEG CEP



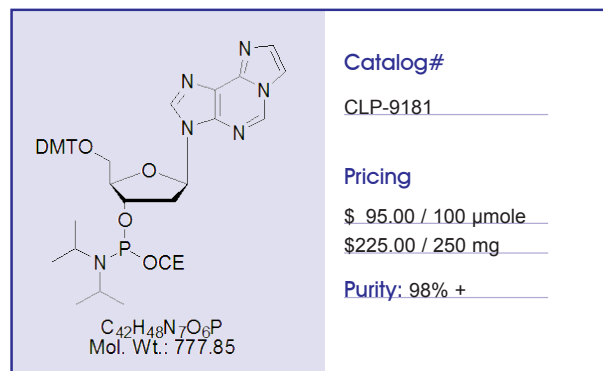
Catalog#
CLP-9907
Pricing
\$145.00 / 50 μ mole
\$260.00 / 100 μ mole
\$495.00 / 250 mg
Purity: 98% +

DNP-TEG Supports & Columns

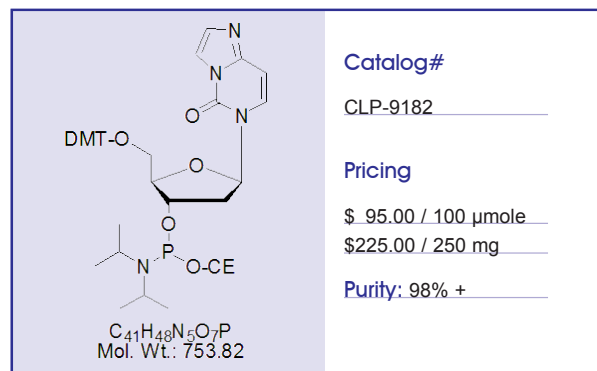
Catalog #	Product Name	Pore Size	Bulk CPG		pack of 4 cols.		pack of 10 cols.	
			100 mg	1 gm	0.2 μ mole	1.0 μ mole	0.2 μ mole	1.0 μ mole
N-9127-05	DNP-TEG-Icaa-CPG	500Å	\$115	\$960	\$110	\$185	\$220	\$370

Phosphoramidites and Supports for Introducing Chromophores & Ligands

Etheno deoxy Adenosine CEP

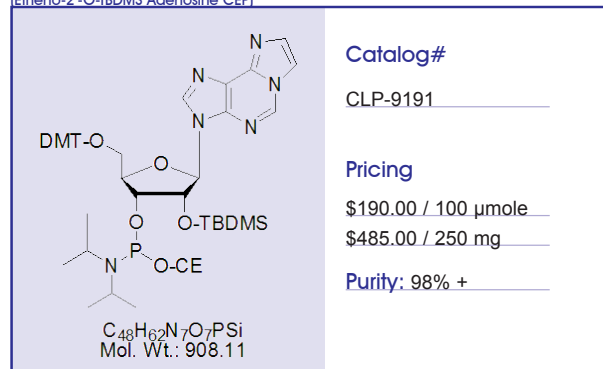


Etheno deoxy Cytidine CEP



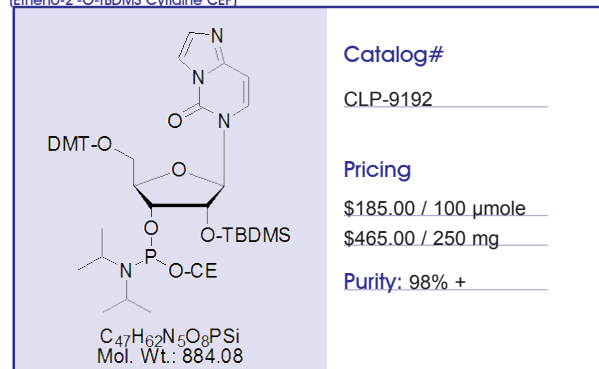
Etheno Adenosine CEP

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



Etheno Cytidine CEP

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



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}

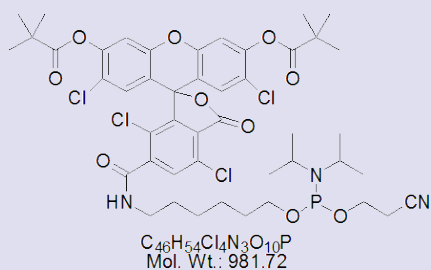
Etheno Succinyl Icaa Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG		pack of 4 cols.		pack of 10 cols.	
			100 mg	1 gm	0.2 μ mole	1.0 μ mole	0.2 μ mole	1.0 μ mole
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						

Oligo Synthesis Products

Phosphoramidites and Supports for Introducing Chromophores & Ligands

Tetrachloro Fluorescein Phosphoramidite (TET)

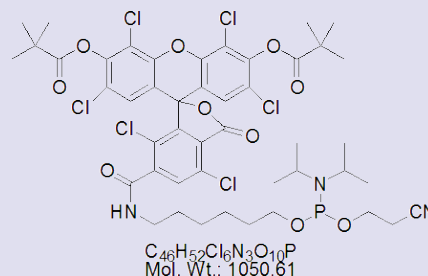


Catalog# Pricing

CLP-9779	\$165.00 / 50 μ mole
	\$325.00 / 100 μ mole
	\$725.00 / 250 mg

Purity: 98% +

Hexachloro Fluorescein Phosphoramidite (HEX)

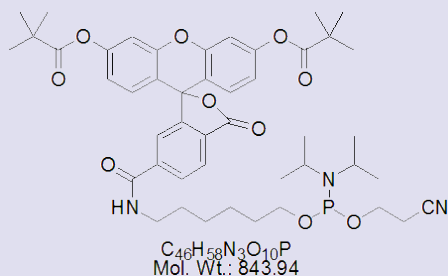


Catalog# Pricing

CLP-9778	\$165.00 / 50 μ mole
	\$325.00 / 100 μ mole
	\$725.00 / 250 mg

Purity: 98% +

6-FAM Phosphoramidite (5'-attachment only)



Catalog# Pricing

CLP-9777	\$165.00 / 50 μ mole
	\$325.00 / 100 μ mole
	\$725.00 / 250 mg

Purity: 98% +

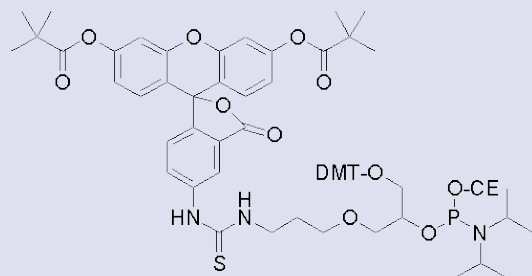
TET, HEX, 6-FAM

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.

Phosphoramidites and Supports for Introducing Chromophores & Ligands

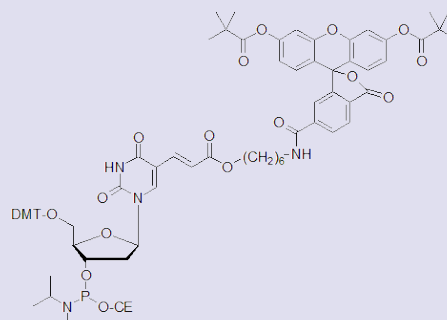
5-Fluorescein CEP



$C_{67}H_{77}N_4O_{14}P$
Mol. Wt.: 1193.32

Catalog#	Pricing
CLP-4282	\$155.00 / 50 μ mole
	\$275.00 / 100 μ mole
	\$550.00 / 250 mg
Purity: 98% +	

Fluorescein dT CEP



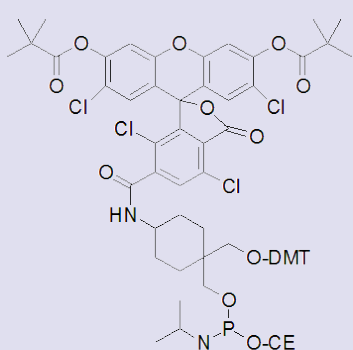
$C_{73}H_{89}N_5O_{17}P$
Mol. Wt.: 1425.56

Catalog#	Pricing
CLP-9905	\$180.00 / 50 μ mole
	\$325.00 / 100 μ mole
	\$680.00 / 250 mg
Purity: 98% +	

Supports & Columns

Catalog #	Product Name	Pore Size	Bulk CPG		pack of 4 cols.		pack of 10 cols.	
			100 mg	1 gm	0.2 μ mole	1.0 μ mole	0.2 μ mole	1.0 μ mole
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

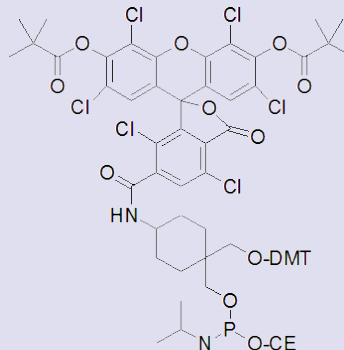
Tetrachloro Fluorescein Cyclohexyl CEP



Catalog#
CLP-1526
Pricing
\$148.00 / 50 μ mole
\$292.00 / 100 μ mole
\$785.00 / 250 mg
Purity: 98% +

$C_{69}H_{74}Cl_4N_3O_{13}P$
Mol. Wt.: 1326.12

Hexachloro Fluorescein Cyclohexyl CEP



Catalog#
CLP-1527
Pricing
\$148.00 / 50 μ mole
\$292.00 / 100 μ mole
\$785.00 / 250 mg
Purity: 98% +

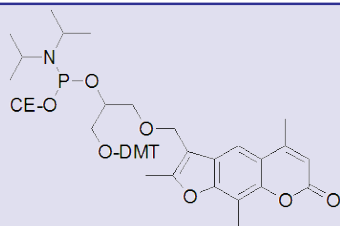
$C_{69}H_{72}Cl_6N_3O_{13}P$
Mol. Wt.: 1395.01

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

Oligo Synthesis Products

Phosphoramidites and Supports for Introducing Chromophores & Ligands

Psoralen CEP



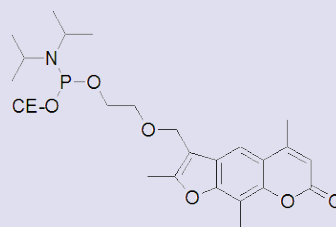
$C_{48}H_{55}N_2O_6P$
Mol. Wt.: 834.93

Catalog# Pricing

CLP-6644	\$115.00 / 50 μ mole
	\$185.00 / 100 μ mole
	\$495.00 / 250 mg

Purity: 98% +

Psoralen C-2 CEP



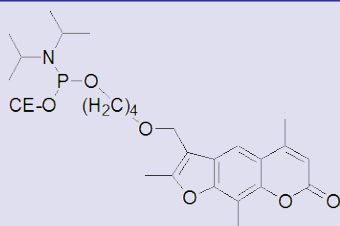
$C_{26}H_{35}N_2O_6P$
Mol. Wt.: 502.54

Catalog# Pricing

CLP-6647	\$160.00 / 100 μ mole
	\$470.00 / 250 mg

Purity: 98% +

Psoralen C-4 CEP



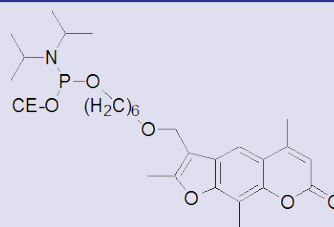
$C_{28}H_{39}N_2O_6P$
Mol. Wt.: 530.59

Catalog# Pricing

CLP-6648	\$170.00 / 100 μ mole
	\$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 μ mole
	\$475.00 / 250 mg

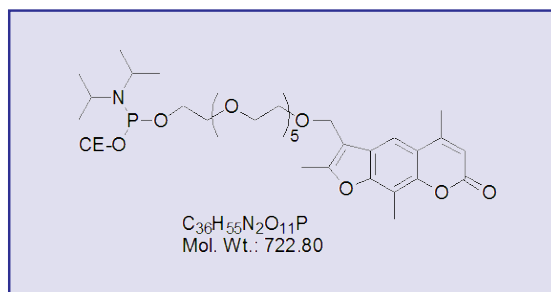
Purity: 98% +

Please Indicate Synthesizer when Ordering

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

Phosphoramidites and Supports for Introducing Chromophores & Ligands

Psoralen C-18 Hexaethoxyglycol CEP



Catalog#	Pricing
CLP-6642	\$187.00 / 100 μ mole
	\$522.00 / 250 mg
Purity:	98% +

Psoralen Supports & Columns

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

Psoralens are a class of naturally occurring 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 hydrolyze 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. Pieses, U. English, Nucl. Acids Res.*, 17, 285, 1989; *U. Pieses, 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. Thuong, 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. Fishelwich, 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).

Please Indicate Synthesizer when Ordering

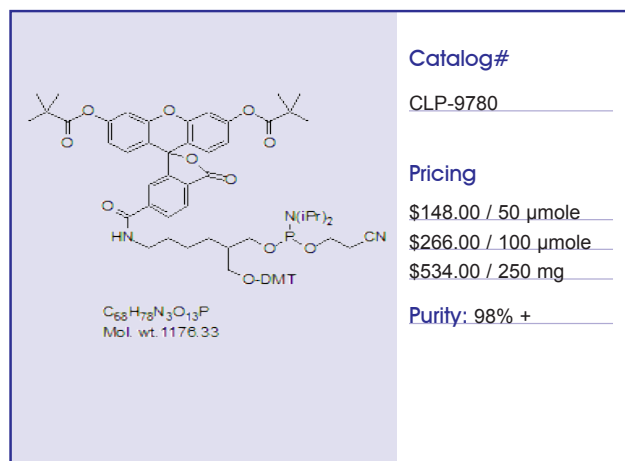
ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

Oligo Synthesis Products

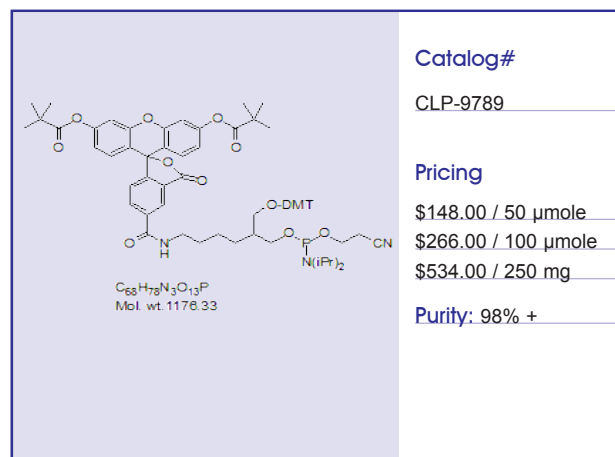
Phosphoramidites and Supports for Introducing Chromophores & Ligands

5 & 6 FAM Phosphoramidites & Supports

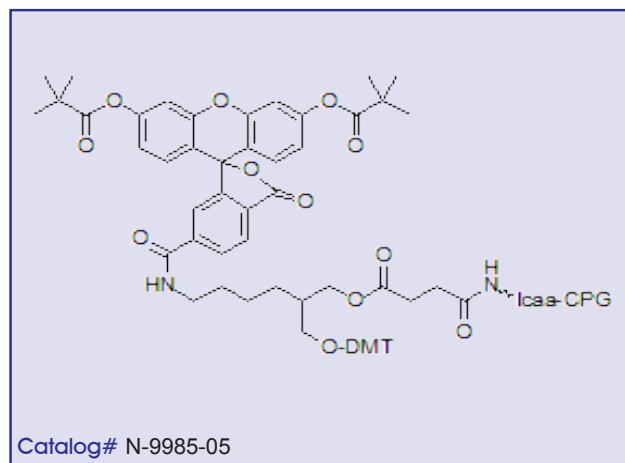
DMT-6-FAM Phosphoramidite



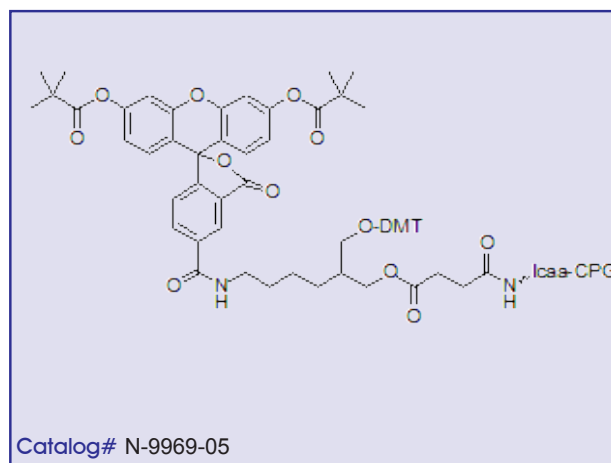
DMT-5-FAM Phosphoramidite



6-FAM CPG



5-FAM CPG



5 & 6 FAM Supports & Columns

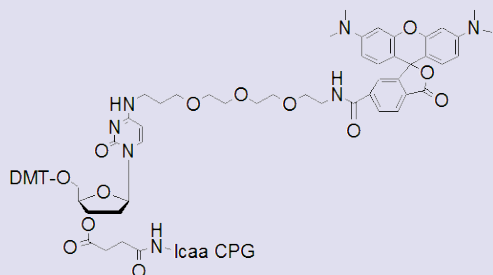
Catalog #	Product Name	Pore Size	Bulk CPG		pack of 4 cols.		pack of 10 cols.	
			100 mg	1 gm	0.2 μ mole	1.0 μ mole	0.2 μ mole	1.0 μ mole
N-9985-05	DMT-6-FAM Icaa CPG	500Å	\$104	\$832	\$104	\$168	\$208	\$375
N-9969-05	DMT-5-FAM Icaa CPG	500Å	\$104	\$832	\$104	\$168	\$208	\$375

Please Indicate Synthesizer when Ordering _____

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

Phosphoramidites and Supports for Introducing Chromophores & Ligands

N⁴-6-TAMRA Cytidine-3'- Icaa CPG



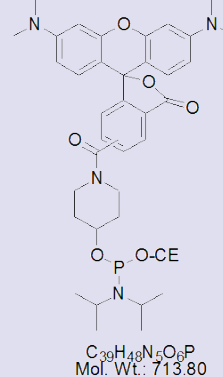
Catalog# N-2145-05

Cocktail for TAMRA

Catalog# Pricing

RN-8561 \$50.00 / 5 ml

5'-TAMRA CEP



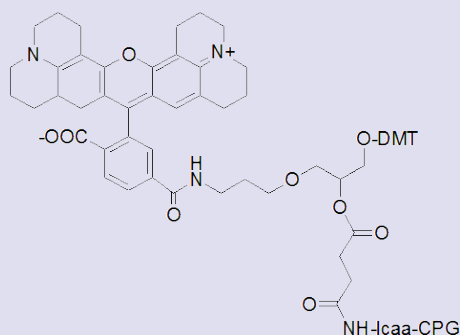
C₃₉H₄₈N₅O₆P
Mol. Wt.: 713.80

Catalog# Pricing

CLP-9066 \$185.00 / 50 μmole
\$395.00 / 100 μmole
\$765.00 / 250 mg

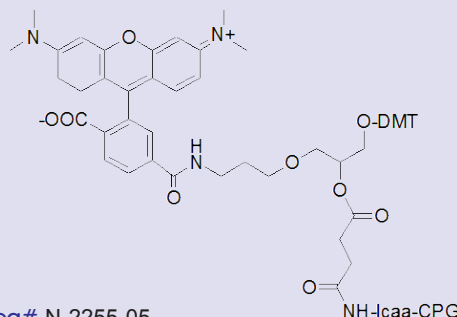
Purity: 98% +

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		pack of 4 cols.		pack of 10 cols.	
			100 mg	1 gm	0.2 μmole	1.0 μmole	0.2 μmole	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

Oligo Synthesis Products

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 overwhelming 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

Poor Uptake

- Molecule too big
- Highly charged

Nuclease Resistant

Greater Specificity, Reacts Rapidly

Higher T_m

2'-OMe Modified Synthetic Oligo

Lipophilic, Amphiphilic

Degradation by nucleases

Less Specificity

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

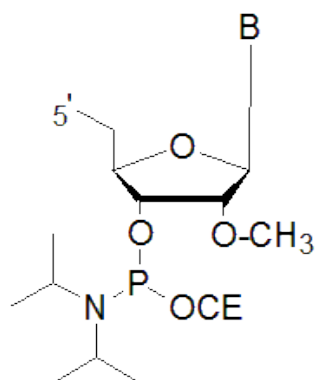
- 2'-O-Methyl oligonucleotides have been used as chimeric oligomers with DNA-oligomers for site directed cleavage of RNA with RNaseH (Refs 1,2).
- 2'-O-Methyl oligonucleotides are more stable against several nucleases as compared to the deoxy and ribo type of oligomers. Therefore, the 2'-O-Methyl oligonucleotides 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 spliceosomes (Refs 5,6).
- The 2'-O-Methylethers of common ribonucleosides 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[®]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

1. Inoune, H., Hayase, Y., Imura, A., Iwai, S., Miura, K., Ohtsuka, E., Nucl. Acids Res. 15:6131-6148 (1987)
2. Shibahara, S., Mukai, S., Nishihara, T., Inoune, H., Ohtsuka, E., and Morisawa, H., Nucl. Acids Res. 15:4403-4415 (1987)
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)
6. Barbino, S., Sproat, B.S., Ryder, U., Blencowe, B.J., and Lamond, A.I., Cell 59: 531-539 (1989)
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 Birnstiel, 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

ChemGenes offers a number of special modified phosphoramidites: new modifications of Antisense producing oligos.

Amidites and Supports for Antisense Oligonucleotides



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

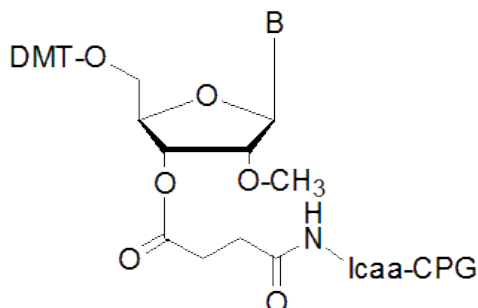
2'-O-Methyl Amidites are covered by ChemGenes patent, U.S. Patent No. 5,525,719

Please Indicate Synthesizer when Ordering

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

Oligo Synthesis Products

Amidites and Supports for Antisense Oligonucleotides



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

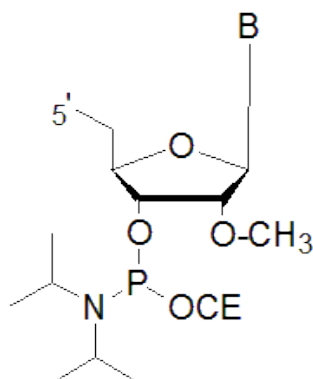
5'	B	Protection	Catalog#
O-DMT	A	N-Bz	N-7910
O-DMT	C	N-Bz	N-7911
O-DMT	G	N-iBu	N-7912
O-DMT	U	n/a	N-7904
O-DMT	C	N-Ac	N-7905

Catalog #	Product Name	Pore Size	Bulk CPG			pack of 4 cols.			each		pack of 10 cols.		
			100	250	1	40	0.2	1.0	10	15	40	0.2	1.0
			mg	mg	g	nmole	μmole	μmole	μmole	μmole	nmole	μmole	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

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

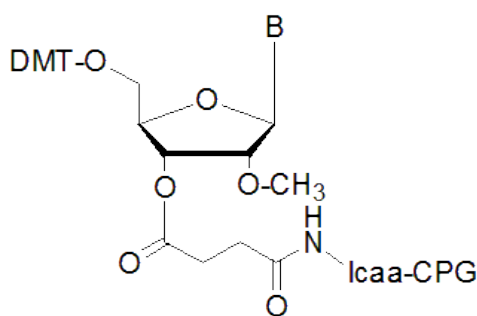
Amidites and Supports for Antisense Oligonucleotides



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, <i>M.W. 917.18</i>	\$22	\$48	\$88	\$158	\$710	\$1,392
ANP-6752	2'-O-Methyl-Cytidine (N-PAC) 3'-CEP, <i>M.W. 893.96</i>	\$22	\$48	\$88	\$158	\$710	\$1,392
ANP-6753	2'-O-Methyl-Guanosine (N-PAC) 3'-CEP, <i>M.W. 933.98</i>	\$22	\$48	\$88	\$158	\$710	\$1,392
ANP-6759 NEW!	2'-O-Methyl-Guanosine (N,N-DMF) 3'-CEP, <i>M.W. 854.93</i>	\$22	\$48	\$88	\$158	\$710	\$1,392
ANP-5754	2'-O-Methyl-Uridine 3'-CEP, <i>M.W. 760.81</i>	\$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		pack of 4 cols.			pack of 10 cols.		
			100 mg	1 gm	40 nmole	0.2 μmole	1.0 μmole	40 nmole	0.2 μmole	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

Please Indicate Synthesizer when Ordering

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

100

www.chemgenes.com

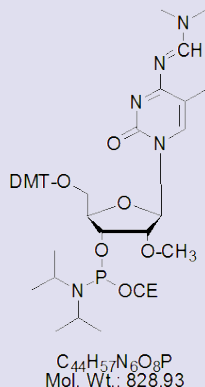
Email: info@chemgenes.com

Oligo Synthesis Products

Amidites and Supports for Antisense Oligonucleotides

5-Methyl Cytidine 2'-O-Methyl CEP

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



Catalog#

ANP-6554

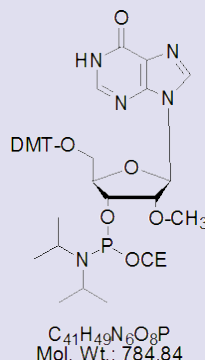
Pricing

\$140.00 / 100 μ mole

\$350.00 / 250 mg

Purity: 98% +

2'-O-Methyl Inosine CEP



Catalog#

ANP-5758

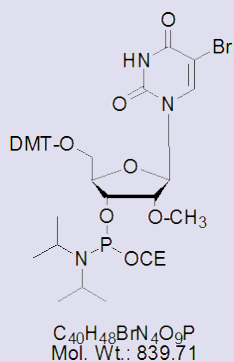
Pricing

\$120.00 / 100 μ mole

\$300.00 / 250 mg

Purity: 98% +

5-Bromo Uridine 2'-O-Methyl CEP



Catalog#

ANP-5760

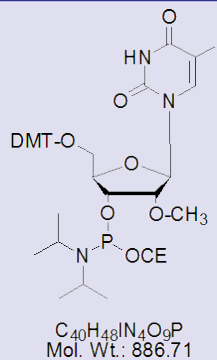
Pricing

\$140.00 / 100 μ mole

\$320.00 / 250 mg

Purity: 98% +

5-Iodo Uridine 2'-O-Methyl CEP



Catalog#

ANP-5759

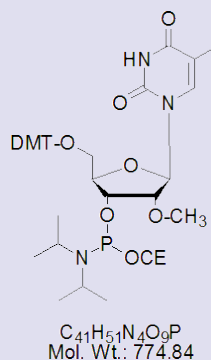
Pricing

\$140.00 / 100 μ mole

\$320.00 / 250 mg

Purity: 98% +

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



Catalog#

ANP-5600

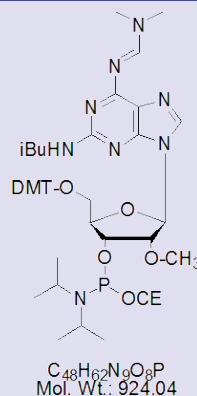
Pricing

\$120.00 / 100 μ mole

\$300.00 / 250 mg

Purity: 98% +

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



Catalog#

ANP-8618

Pricing

\$285.00 / 100 μ mole

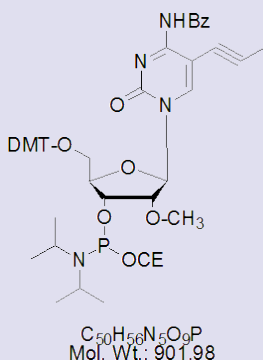
\$740.00 / 250 mg

Purity: 98% +

Amidites and Supports for Antisense Oligonucleotides

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

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



Catalog#

ANP-1874

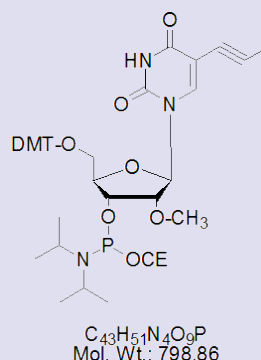
Pricing

\$242.00 / 100 μ mole

\$620.00 / 250 mg

Purity: 98% +

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



Catalog#

ANP-1347

Pricing

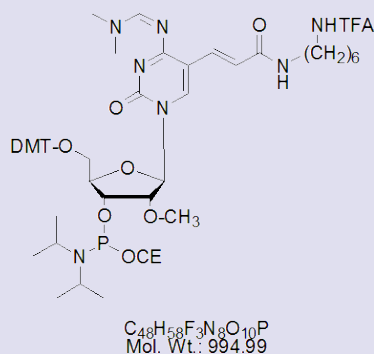
\$220.00 / 100 μ mole

\$580.00 / 250 mg

Purity: 98% +

Amino Modifier Cytidine CEP

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



Catalog#

ANP-2583

Pricing

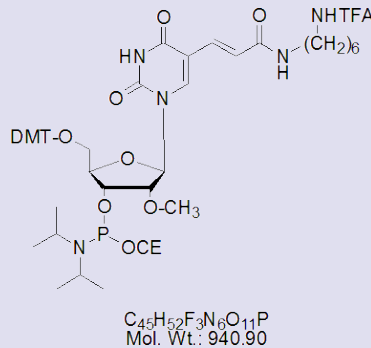
\$270.00 / 100 μ mole

\$540.00 / 250 mg

Purity: 98% +

Amino Modifier Uridine CEP

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



Catalog#

ANP-2581

Pricing

\$225.00 / 100 μ mole

\$450.00 / 250 mg

Purity: 98% +

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

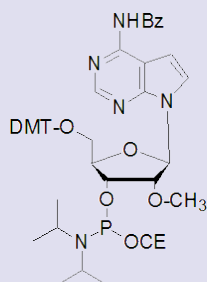
Catalog #	Product Name	Pore Size	Bulk CPG		pack of 4 cols.		pack of 10 cols.	
			250 mg	1 gm	0.2 μ mole	1.0 μ mole	0.2 μ mole	1.0 μ mole
N-1613-05	5-Methyl Cytidine (N,N-DMF)	500Å	\$230	\$900	\$125	\$200	\$250	\$400
N-1613-10	2'-O-Methyl-3'-Icaa CPG	1000Å						
N-9013-05	Inosine 2'-O-Methyl	500Å	\$230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

Oligo Synthesis Products

Amidites and Supports for Antisense Oligonucleotides

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

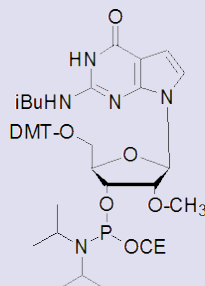
\$264.00 / 50 μ mole

\$462.00 / 100 μ mole

Purity: 98% +

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

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



$C_{46}H_{57}N_6O_8P$
Mol. Wt.: 868.95

Catalog#

ANP-5953

Pricing

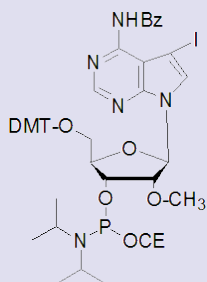
\$279.00 / 50 μ mole

\$495.00 / 100 μ mole

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

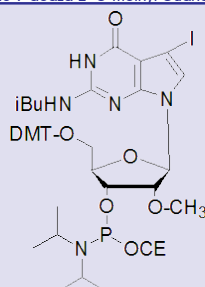
\$286.00 / 50 μ mole

\$495.00 / 100 μ mole

Purity: 98% +

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

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



$C_{46}H_{56}IN_6O_8P$
Mol. Wt.: 994.85

Catalog#

ANP-9173

Pricing

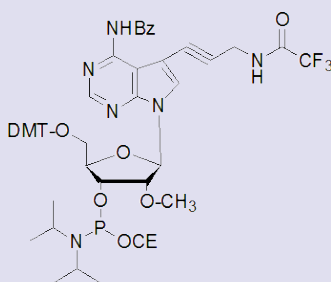
\$286.00 / 50 μ mole

\$495.00 / 100 μ mole

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#

ANP-9176

Pricing

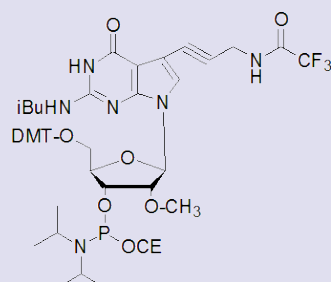
\$315.00 / 50 μ mole

\$534.00 / 100 μ mole

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#

ANP-9178

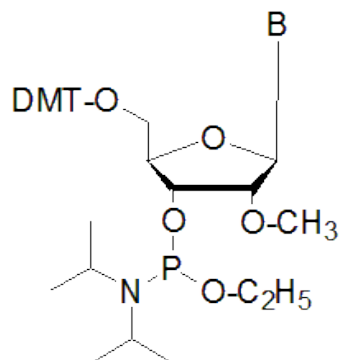
Pricing

\$315.00 / 50 μ mole

\$534.00 / 100 μ mole

Purity: 98% +

Amidites and Supports for Antisense Oligonucleotides



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) <i>P-Ethoxy phosphoramidite, M.W. 826.93</i>	\$55	\$90	\$146
ANP-7222	2'-O-Methyl Cytidine (N-Bz) <i>P-Ethoxy phosphoramidite, M.W. 838.90</i>	\$55	\$90	\$146
ANP-7223	2'-O-Methyl Guanosine (N-iBu) <i>P-Ethoxy phosphoramidite, M.W. 844.92</i>	\$55	\$90	\$146
ANP-7224	2'-O-Methyl Thymidine <i>P-Ethoxy phosphoramidite, M.W. 735.78</i>	\$55	\$90	\$146
ANP-7225	2'-O-Methyl Uridine <i>P-Ethoxy phosphoramidite, M.W. 721.77</i>	\$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.

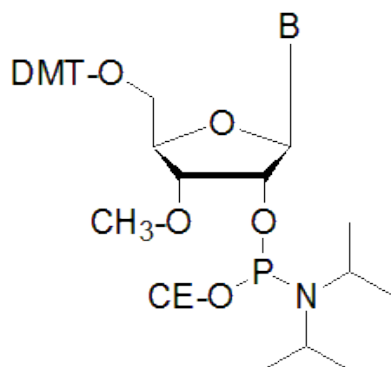
The above products are covered under ChemGenes patent #6,015,886.

Please Indicate Synthesizer when Ordering _____

ABI	ABI 3900	Beckman	Expedite	MerMade	PolyPlex
AB30	AB39	BK	EX	MR	PX

Oligo Synthesis Products

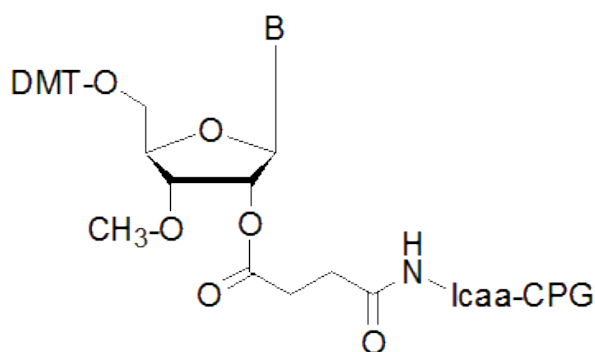
Amidites and Supports for Antisense Oligonucleotides



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, <i>M.W. 887.96</i>	\$165	\$294	\$530
ANP-2902	3'-O-Methyl Cytidine (N-Bz) 2'-CEP, <i>M.W. 863.93</i>	\$165	\$294	\$530
ANP-2903	3'-O-Methyl Guanosine (N-iBu) 2'-CEP, <i>M.W. 869.94</i>	\$165	\$294	\$530
ANP-2904	3'-O-Methyl Uridine 2'-CEP, <i>M.W. 760.81</i>	\$165	\$294	\$530
ANP-2905	3'-O-Methyl Inosine 2'-CEP, <i>M.W. 784.84</i>	\$165	\$294	\$530



3'-O-Methyl Supports 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		pack of 4 cols.		pack of 10 cols.	
			250 mg	1 gm	0.2 μ mole	1.0 μ mole	0.2 μ mole	1.0 μ mole
N-8810-05	3'-O-Methyl Adenosine	500Å	\$125	\$480	\$ 95	\$120	\$190	\$240
N-8810-10	(N-Bz) 2'-Icaa CPG	1000Å						
N-8811-05	3'-O-Methyl Cytidine	500Å	\$125	\$480	\$ 95	\$120	\$190	\$240
N-8811-10	(N-Bz) 2'-Icaa CPG	1000Å						
N-8812-05	3'-O-Methyl Guanosine	500Å	\$125	\$480	\$ 95	\$120	\$190	\$240
N-8812-10	(N-iBu) 2'-Icaa CPG	1000Å						
N-8813-05	3'-O-Methyl Uridine	500Å	\$125	\$480	\$ 95	\$120	\$190	\$240
N-8813-10	2'-Icaa CPG	1000Å						
N-8814-05	3'-O-Methyl Inosine	500Å	\$250	\$900	\$135	\$245	\$270	\$490
N-8814-10	2'-Icaa CPG	1000Å						

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

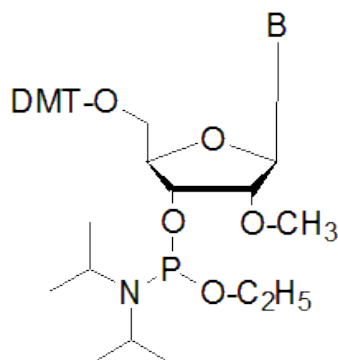
105



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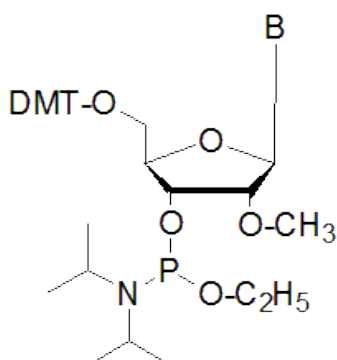
Amidites and Supports for Antisense Oligonucleotides



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, <i>M.W. 832.92</i>	\$45	\$80
ANP-6542	deoxy Cytidine (N-Bz) 3'-P-Ethoxy phosphoramidite, <i>M.W. 808.90</i>	\$45	\$80
ANP-6543	deoxy Guanosine (N-iBu) 3'-P-Ethoxy phosphoramidite, <i>M.W. 814.91</i>	\$45	\$80
ANP-6544	Thymidine 3'-P-Ethoxy phosphoramidite, <i>M.W. 719.80</i>	\$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

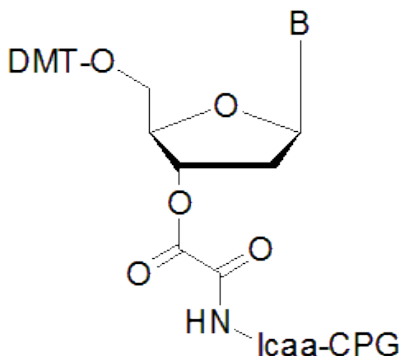
Catalog #	Product Name	250mg	500mg	1gm
ANP-5541	deoxy Adenosine (N-PAC) 3'-P-Ethoxy phosphoramidite, <i>M.W. 862.95</i>	\$27	\$48	\$90
ANP-5542	deoxy Cytidine (N-PAC) 3'-P-Ethoxy phosphoramidite, <i>M.W. 838.92</i>	\$27	\$48	\$90
ANP-5543	deoxy Guanosine (N-PAC) 3'-P-Ethoxy phosphoramidite, <i>M.W. 935.05</i>	\$27	\$48	\$90
ANP-6544	Thymidine 3'-P-Ethoxy phosphoramidite, <i>M.W. 719.80</i>	\$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 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		pack of 4 cols.			pack of 10 cols.		
			100 mg	1 gm	40 μmole	0.2 μmole	1.0 μmole	40 μmole	0.2 μmole	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.

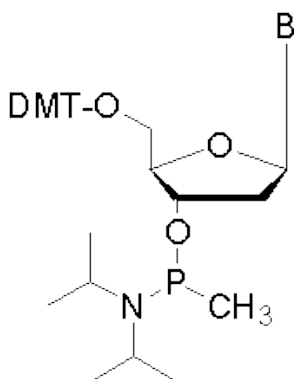
Ammonia Free Oligo Deprotection Solution

Catalog#	Pricing
RN-1435	\$35.00 / 25 ml

Please Indicate Synthesizer when Ordering

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

Amidites and Supports for Antisense Oligonucleotides



P-Methyl Phosphonamidites with Standard Base Protection

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

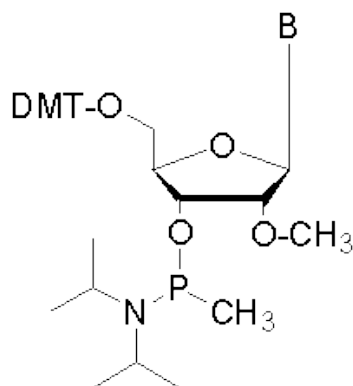
Catalog #	Product Name	250mg	500mg
ANP-7551	deoxy Adenosine (<i>N</i> -Bz) 3'- <i>P</i> -Methyl phosphonamidite, <i>M.W.</i> 802.90	\$50	\$90
ANP-7556	deoxy Cytidine (<i>N</i> -iBu) 3'- <i>P</i> -Methyl phosphonamidite, <i>M.W.</i> 744.86	\$50	\$90
ANP-7553	deoxy Guanosine (<i>N</i> -iBu) 3'- <i>P</i>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

Please Indicate Synthesizer when Ordering

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

Oligo Synthesis Products

Amidites and Supports for Antisense Oligonucleotides



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

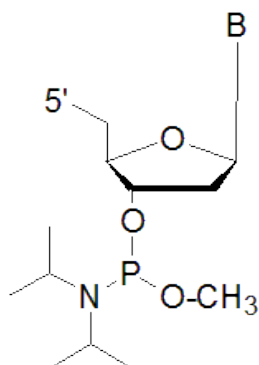
5'	B	Protection	Catalog#
O-DMT	A	<i>N</i> -Bz	ANP-8551
O-DMT	C	<i>N</i> -Bz	ANP-8552
O-DMT	G	<i>N</i> -iBu	ANP-8553
O-DMT	U	n/a	ANP-8554
O-DMT	C	<i>N</i> -Ac	ANP-8556

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

Please Indicate Synthesizer when Ordering _____

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

Amidites and Supports for Antisense Oligonucleotides



P-Methoxy DNA **Amidites with Labile Base Protection

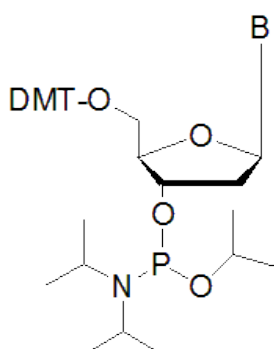
5'	B	Protection	Catalog#
O-DMT	A	N-PAC	ANP-5531
O-DMT	C	N-PAC	ANP-5532
O-DMT	G	n-tBPAC	ANP-5533
O-MMT	A	N-PAC	ANP-5536
O-MMT	G	n-tBPAC	ANP-5537

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

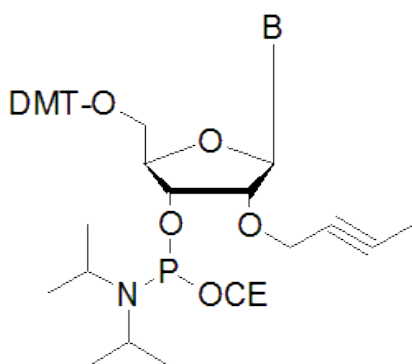
5'	B	Protection	Catalog #
O-DMT	A	N-Bz	ANP-6901
O-DMT	C	N-Bz	ANP-6902
O-DMT	G	N-iBu	ANP-6903
O-DMT	T	n/a	ANP-6904

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

Oligo Synthesis Products

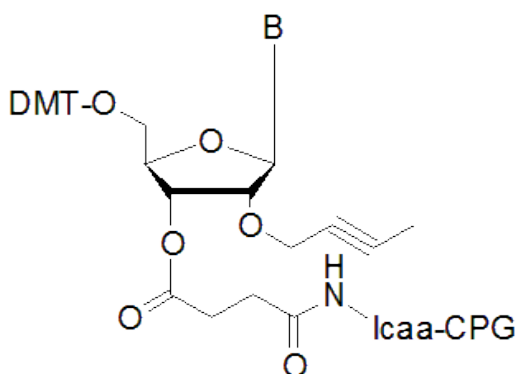
Amidites and Supports for Antisense Oligonucleotides



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	100 μ mole	250mg
ANP-7621	2'-O-Butyne Adenosine (N-Bz) 3'-CEP, <i>M.W.</i> 926.01	\$185	\$360
ANP-7622	2'-O-Butyne Cytidine (N-Bz) 3'-CEP, <i>M.W.</i> 901.98	\$185	\$360
ANP-7623	2'-O-Butyne Guanosine (N-iBu) 3'-CEP, <i>M.W.</i> 907.99	\$185	\$360
ANP-7625	2'-O-Butyne Uridine 3'-CEP, <i>M.W.</i> 798.86	\$185	\$360

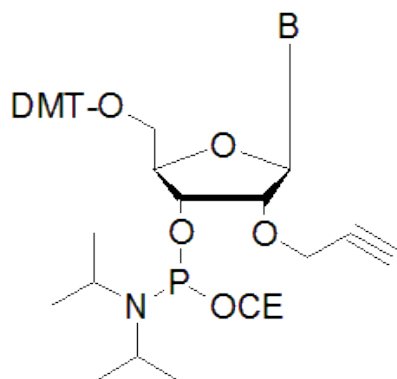


2'-O-Butyne Supports with Standard Base Protection

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		pack of 4 cols.		pack of 10 cols.	
			100 mg		0.2 μ mole	1.0 μ mole	0.2 μ mole	1.0 μ mole
N-9611-05	2'-O-Butyne Adenosine (N-Bz)	500Å	\$65		\$80	\$95	\$160	\$190
N-9611-10	3'-Icaa CPG	1000Å						
N-9612-05	2'-O-Butyne Cytidine (N-Bz)	500Å	\$65		\$80	\$95	\$160	\$190
N-9612-10	3'-Icaa CPG	1000Å						
N-9613-05	2'-O-Butyne Guanosine (N-iBu)	500Å	\$65		\$80	\$95	\$160	\$190
N-9613-10	3'-Icaa CPG	1000Å						
N-9614-05	2'-O-Butyne Uridine	500Å	\$65		\$80	\$95	\$160	\$190
N-9614-10	3'-Icaa CPG	1000Å						

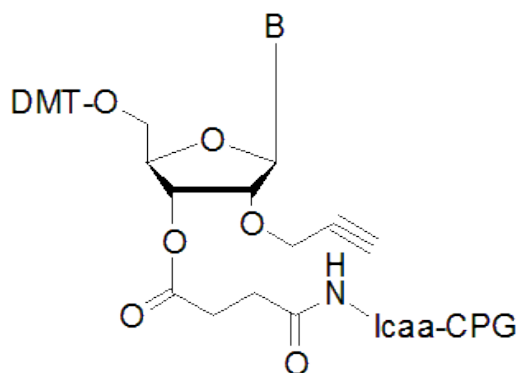
Amidites and Supports for Antisense Oligonucleotides



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	100 μ mole	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

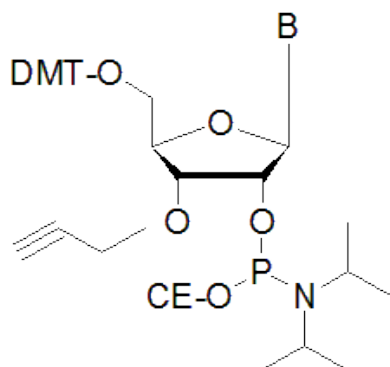
5'	B	Protection	Catalog #
O-DMT	A	N-Bz	N-8910
O-DMT	C	N-Bz	N-8920
O-DMT	G	N-iBu	N-8930
O-DMT	U	n/a	N-8940

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

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

Oligo Synthesis Products

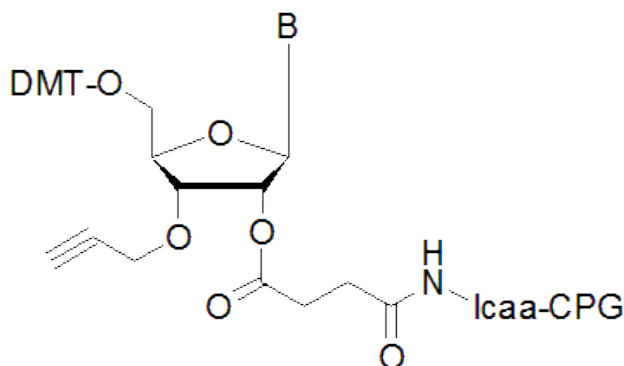
Amidites and Supports for Antisense Oligonucleotides



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	100 μ mole	250mg
ANP-9751	3'-O-Propargyl Adenosine (N-Bz) 2'-CEP, <i>M.W.</i> 911.98	\$185	\$360
ANP-9752	3'-O-Propargyl Cytidine (N-Bz) 2'-CEP, <i>M.W.</i> 887.96	\$185	\$360
ANP-9753	3'-O-Propargyl Guanosine (N-iBu) 2'-CEP, <i>M.W.</i> 893.96	\$185	\$360
ANP-9754	3'-O-Propargyl Uridine 2'-CEP, <i>M.W.</i> 784.83	\$185	\$360



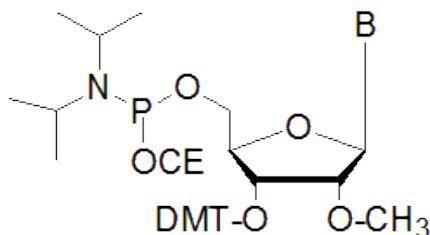
3'-O-Propargyl Supports with Standard Base Protection

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	pack of 4 cols.		pack of 10 cols.	
			100 mg	0.2 μ mole	1.0 μ mole	0.2 μ mole	1.0 μ mole
N-9881-05	3'-O-Propargyl Adenosine (N-Bz)	500Å	\$65	\$80	\$95	\$160	\$190
N-9881-10	2'-lcaa CPG	1000Å					
N-9882-05	3'-O-Propargyl Cytidine (N-Bz)	500Å	\$65	\$80	\$95	\$160	\$190
N-9882-10	2'-lcaa CPG	1000Å					
N-9883-05	3'-O-Propargyl Guanosine (N-iBu)	500Å	\$65	\$80	\$95	\$160	\$190
N-9883-10	2'-lcaa CPG	1000Å					
N-9884-05	3'-O-Propargyl Uridine	500Å	\$65	\$80	\$95	\$160	\$190
N-9884-10	2'-lcaa CPG	1000Å					

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

Amidites and Supports for Antisense Oligonucleotides



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

Catalog#
ANP-1016

Pricing
\$85.00 / 50 µmole
\$126.00 / 100 µmole

Purity: 98% +

Mol. Wt.: 877.96

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

Catalog#
ANP-1017

Pricing
\$85.00 / 50 µmole
\$126.00 / 100 µmole

Purity: 98% +

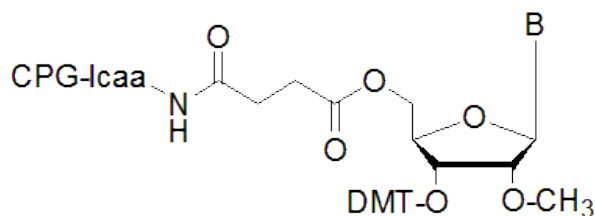
Mol. Wt.: 774.84

Please Indicate Synthesizer when Ordering

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

Nucleosides & Reagents

Unprotected Nucleosides



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

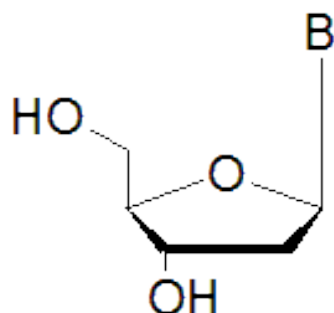
3'	B	Protection	Catalog #
O-DMT	A	N-Bz	N-9912
O-DMT	C	N-Bz	N-9913
O-DMT	G	N-iBu	N-9914
O-DMT	U	n/a	N-9915
O-DMT	C	N-Ac	N-9919
O-DMT	5-Me-C	N-Bz	N-9916
O-DMT	5-Me-U	n/a	N-9917

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

Please Indicate Synthesizer when Ordering

ABI	ABI 3900	Expedite	MerMade	PolyPlex
AB30	AB39	EX	MR	PX

Unprotected Nucleosides



Deoxy Nucleosides

B _____ Catalog# _____

A _____ DN-1001

C _____ DN-1002

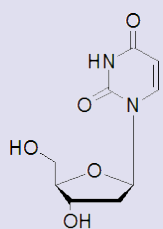
G _____ DN-1003

T _____ DN-1004

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

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

2'-deoxy Uridine

C₉H₁₂N₂O₅
Mol. Wt.: 228.20

Catalog# _____

DN-6373 _____

Pricing

\$ 16.50 / 1 gm _____

\$ 75.00 / 5 gm _____

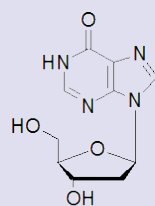
\$ 135.00 / 10 gm _____

\$ 320.00 / 25 gm _____

\$1,120.00 / 100 gm _____

Purity: 98% + _____

2'-deoxy Inosine

C₁₀H₁₂N₄O₄
Mol. Wt.: 252.23

Catalog# _____

DN-4002 _____

Pricing

\$ 18.50 / 1 gm _____

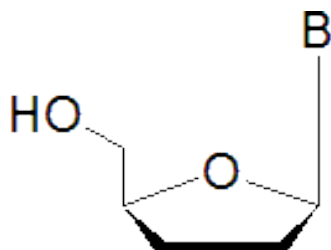
\$ 82.50 / 5 gm _____

\$155.00 / 10 gm _____

Purity: 98% + _____

Nucleosides & Reagents

Unprotected Nucleosides



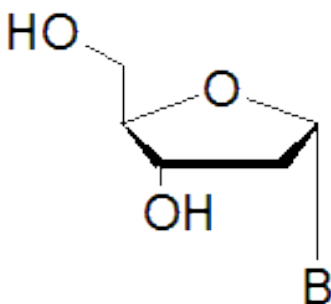
Dideoxy Nucleosides

B	Catalog#
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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 <i>M.W. 235.24</i>	\$80	\$250	\$1,000
DDN-1868	dideoxy Cytidine <i>M.W. 211.22</i>	\$80	\$250	\$1,000
DDN-1882	dideoxy Guanosine <i>M.W. 251.24</i>	\$80	\$250	\$1,000
DDN-1883	dideoxy Thymidine <i>M.W. 226.23</i>	\$80	\$250	\$1,000
DDN-1892	dideoxy Uridine <i>M.W. 212.20</i>	\$80	\$250	\$1,000

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



Alpha Nucleosides

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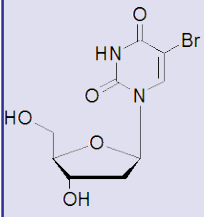
A	DN-6351
C	DN-6352
G	DN-6353
T	DN-6354

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

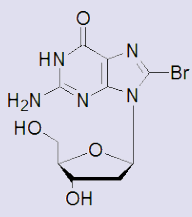
Purity: All the above produced have a purity of 98% + _____

Modified Deoxy Nucleosides

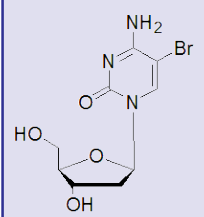
5-Bromo deoxy Uridine

 <chem>C6H11BrN2O5</chem> Mol. Wt.: 307.10	Catalog#
	DN-1136
	Pricing
	\$6.50 / 100 mg
	\$845.00 / 25 gm
	Purity: 98% +

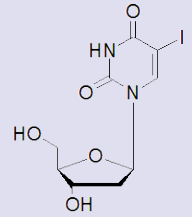
8-Bromo deoxy Guanosine

 <chem>C10H12BrN5O4</chem> Mol. Wt.: 346.14	Catalog#
	DN-1203
	Pricing
	\$17.00 / 100 mg
	\$300.00 / 5 gm
	Purity: 98% +

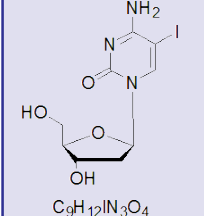
5-Bromo deoxy Cytidine

 <chem>C6H12BrN3O4</chem> Mol. Wt.: 306.11	Catalog#
	DN-6496
	Pricing
	\$80.00 / 1 gm
	\$320.00 / 5 gm
	Purity: 98% +

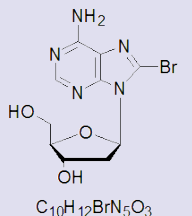
5-Iodo deoxy Uridine

 <chem>C9H11IN2O5</chem> Mol. Wt.: 354.10	Catalog#
	DN-1180
	Pricing
	\$10.00 / 500 mg
	\$760.00 / 100 gm
	Purity: 98% +

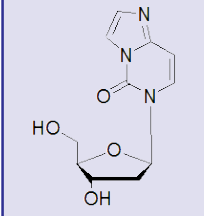
5-Iodo deoxy Cytidine

 <chem>C9H12IN3O4</chem> Mol. Wt.: 353.11	Catalog#
	DN-1181
	Pricing
	\$36.00 / 1 gm
	\$324.00 / 10 gm
	Purity: 98% +

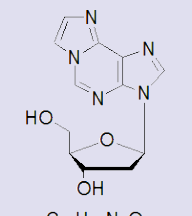
8-Bromo deoxy Adenosine

 <chem>C10H12BrN5O3</chem> Mol. Wt.: 330.14	Catalog#
	DN-1182
	Pricing
	\$22.00 / 100 mg
	\$180.00 / 1 gm
	Purity: 98% +

Etheno deoxy Cytidine

 <chem>C11H13N3O4</chem> Mol. Wt.: 251.24	Catalog#
	DN-4252
	Pricing
	\$28.00 / 25 mg
	\$90.00 / 100 mg
	Purity: 98% +

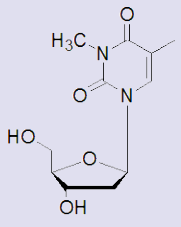
Etheno deoxy Adenosine

 <chem>C12H13N5O3</chem> Mol. Wt.: 275.26	Catalog#
	DN-4895
	Pricing
	\$15.50 / 10 mg
	\$100.00 / 100 mg
	Purity: 98% +

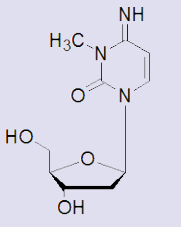
Nucleosides & Reagents

Unprotected Nucleosides

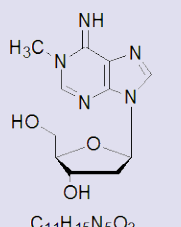
N³-Methyl Thymidine

 <chem>C11H16N2O5</chem> Mol. Wt.: 256.26	Catalog#
	DN-1599 _____
	Pricing
	\$ 42.00 / 25 mg _____ \$126.00 / 100 mg _____
	Purity: 98% + _____

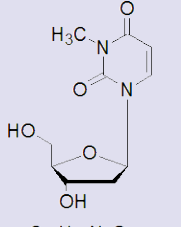
N³-Methyl deoxy Cytidine

 <chem>C10H15N3O4</chem> Mol. Wt.: 241.24	Catalog#
	DN-6493 _____
	Pricing
	\$110.00 / 25 mg _____ \$375.00 / 100 mg _____
	Purity: 98% + _____

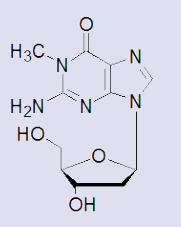
N¹-Methyl deoxy Adenosine

 <chem>C11H15N5O3</chem> Mol. Wt.: 265.27	Catalog#
	DN-1597 _____
	Pricing
	\$120.00 / 25 mg _____ \$382.00 / 100 mg _____
	Purity: 98% + _____

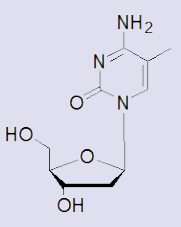
N³-Methyl deoxy Uridine

 <chem>C10H14N2O5</chem> Mol. Wt.: 242.23	Catalog#
	DN-6495 _____
	Pricing
	\$ 80.00 / 25 mg _____ \$275.00 / 100 mg _____
	Purity: 98% + _____

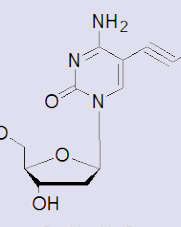
N¹-Methyl deoxy Guanosine

 <chem>C11H15N5O4</chem> Mol. Wt.: 281.27	Catalog#
	DN-1598 _____
	Pricing
	\$120.00 / 25 mg _____ \$382.00 / 100 mg _____
	Purity: 98% + _____

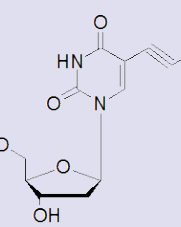
5-Methyl deoxy Cytidine

 <chem>C10H15N3O4</chem> 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% + _____

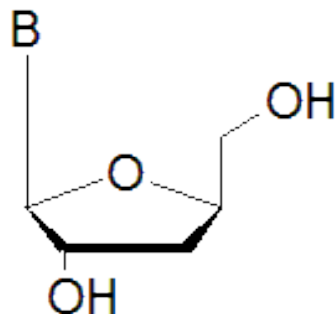
5-Propynyl deoxy Cytidine

 <chem>C12H15N3O4</chem> Mol. Wt.: 265.27	Catalog#
	DN-1541 _____
	Pricing
	\$115.00 / 10 mg _____ \$225.00 / 25 mg _____
	Purity: 98% + _____

5-Propynyl deoxy Uridine

 <chem>C12H14N2O5</chem> Mol. Wt.: 266.25	Catalog#
	DN-1846 _____
	Pricing
	\$ 75.00 / 100 mg _____ \$525.00 / 1 gm _____
	Purity: 98% + _____

Unprotected Nucleosides



b-L-Deoxy Nucleosides

B	Catalog#
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A	DN-8231
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C	DN-8232
---	---------

G	DN-8233
---	---------

T	DN-8234
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U	DN-8235
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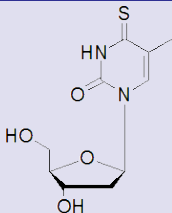
Catalog#	Product Name	100mg	500mg	1gm
DN-8231	b-L-deoxy Adenosine <i>M.W. 251.24</i>	\$55	\$195	\$325
DN-8232	b-L-deoxy Cytidine <i>M.W. 227.22</i>	\$55	\$195	\$325
DN-8233	b-L-deoxy Guanosine <i>M.W. 267.24</i>	\$55	\$195	\$325
DN-8234	b-L-deoxy Thymidine <i>M.W. 242.23</i>	\$55	\$195	\$325
DN-8235	b-L-deoxy Uridine <i>M.W. 228.20</i>	\$55	\$195	\$325

Nucleosides & Reagents

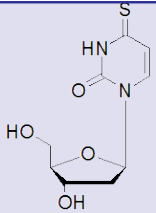
Unprotected Nucleosides

Modified Deoxy Nucleosides

4-Thio Thymidine

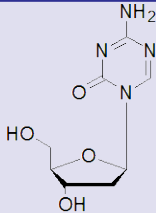
	Catalog# DN-1781 _____
	Pricing \$45.00 / 50 mg _____ \$75.00 / 100 mg _____ \$210.00 / 250 mg _____
$C_{10}H_{14}N_2O_4S$ Mol. Wt.: 258.30	Purity: 98% + _____

4-Thio deoxy Uridine

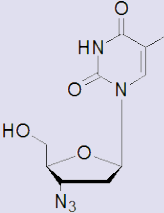
	Catalog# DN-1263 _____
	Pricing \$45.00 / 50 mg _____ \$75.00 / 100 mg _____ \$210.00 / 250 mg _____
$C_9H_{12}N_2O_4S$ Mol. Wt.: 244.27	Purity: 98% + _____

5-aza 2'-deoxy Cytidine

(4-Amino-1-(2-deoxy-8-D-ribofuranosyl)-1,3,5-triazin-2(1H)-one

	Catalog# DN-1771 _____
	Pricing \$42.00 / 10 mg _____ \$154.00 / 50 mg _____ \$264.00 / 100 mg _____
$C_8H_{12}N_4O_4$ Mol. Wt.: 228.21	Purity: 98% + _____

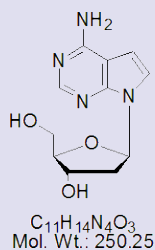
3'-Azido 3'-deoxy Thymidine

	Catalog# DN-1774 _____
	Pricing \$60.00 / 10 mg _____ \$85.00 / 50 mg _____ \$160.00 / 100 mg _____
$C_{10}H_{13}N_5O_4$ Mol. Wt.: 267.24	Purity: 98% + _____

Unprotected Nucleosides

7-Deaza Deoxy Nucleosides

7-Deaza deoxy Adenosine



Catalog#

DN-1143

Pricing

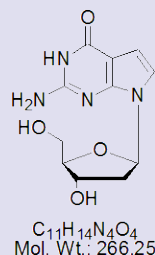
\$ 45.00 / 100 mg

\$225.00 / 500 mg

\$400.00 / 1 gm

Purity: 98% +

7-Deaza-deoxy Guanosine



Catalog#

DN-4567

Pricing

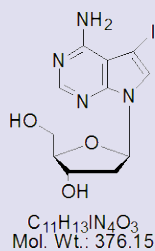
\$ 45.00 / 100 mg

\$225.00 / 500 mg

\$400.00 / 1 gm

Purity: 98% +

7-Deaza-7-Iodo deoxy Adenosine



Catalog#

DN-2561

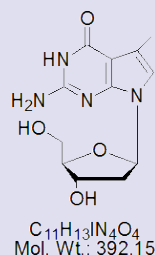
Pricing

\$ 75.00 / 10 mg

\$160.00 / 25 mg

Purity: 98% +

7-Deaza-7-Iodo deoxy Guanosine



Catalog#

DN-2563

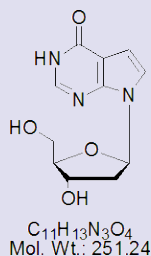
Pricing

\$ 75.00 / 10 mg

\$160.00 / 25 mg

Purity: 98% +

7-Deaza deoxy Inosine



Catalog#

DN-1145

Pricing

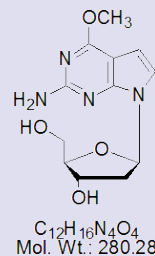
\$ 45.00 / 100 mg

\$225.00 / 500 mg

\$400.00 / 1 gm

Purity: 98% +

7-Deaza-6-O-methyl deoxy Guanosine



Catalog#

DN-1147

Pricing

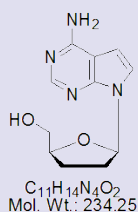
\$ 45.00 / 100 mg

\$225.00 / 500 mg

\$400.00 / 1 gm

Purity: 98% +

7-Deaza-2',3'-dideoxy Adenosine



Catalog#

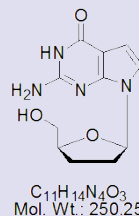
DDN-3864

Pricing

\$360.00 / 100 mg

Purity: 98% +

7-Deaza-2,3-dideoxy Guanosine



Catalog#

DDN-1863

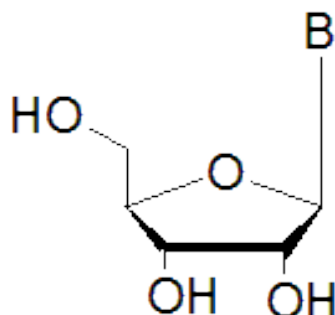
Pricing

\$360.00 / 100 mg

Purity: 98% +

Nucleosides & Reagents

Unprotected Nucleosides



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 <i>M.W. 267.25</i>	\$4	\$8	\$48	\$440
RP-1184	ribo Cytidine <i>M.W. 243.22</i>	\$5	\$13	\$160	\$950
RP-1185	ribo Guanosine <i>M.W. 283.24</i>	\$4	\$8	\$75	\$615
RP-1186	ribo Uridine <i>M.W. 244.20</i>	\$4	\$11	\$146	\$1,220
RP-1187	ribo Inosine <i>M.W. 268.23</i>	\$4	\$9	\$88	\$682

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

Modified Ribo Nucleosides

5-Methyl Cytidine

Catalog#
RP-1832 _____

Pricing
\$ 40.00 / 25 mg _____
\$ 70.00 / 50 mg _____
\$1,000.00 / 1 gm _____

Purity: 98% + _____

$C_{10}H_{15}N_3O_5$
Mol. Wt.: 257.24

ribo Thymidine

Catalog#
RP-1188 _____

Pricing
\$ 16.00 / 25 mg _____
\$ 48.00 / 100 mg _____
\$250.00 / 1 gm _____

Purity: 98% + _____

$C_{10}H_{14}N_2O_6$
Mol. Wt.: 258.23

2'-Fluoro deoxy Uridine

Catalog#
RP-1217 _____

Pricing
\$325.00 / 500 mg _____

Purity: 98% + _____

$C_9H_{11}FN_2O_5$
Mol. Wt.: 246.19

2'-Fluoro deoxy Cytidine

Catalog#
RP-1218 _____

Pricing
\$350.00 / 500 mg _____

Purity: 98% + _____

$C_9H_{12}FN_3O_4$
Mol. Wt.: 245.21

4-Thio Uridine

Catalog#
RP-2304 _____

Pricing
\$110.00 / 100 mg _____
\$220.00 / 250 mg _____

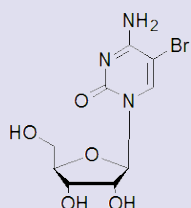
Purity: 98% + _____

$C_9H_{12}N_2O_5S$
Mol. Wt.: 260.27

Unprotected Nucleosides

Modified Ribo Nucleosides

5-Bromo Cytidine



$C_9H_{12}BrN_3O_5$
Mol. Wt.: 322.11

Catalog#

RP-1215 _____

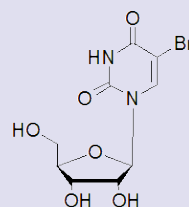
Pricing

\$ 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

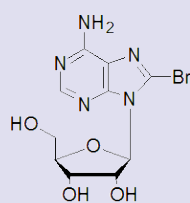
\$20.00 / 250 mg _____

\$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 _____

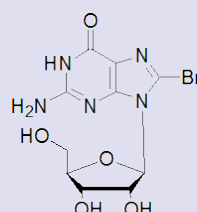
Pricing

\$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 _____

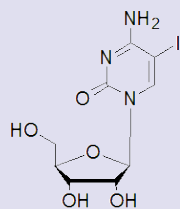
Pricing

\$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 _____

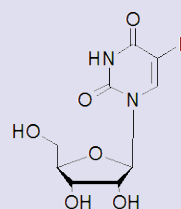
Pricing

\$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 _____

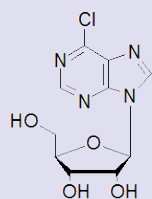
\$ 30.00 / 500 mg _____

\$ 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 _____

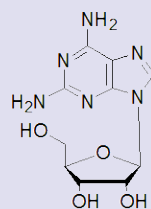
Pricing

\$ 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 _____

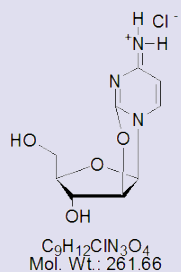
Purity: 98% + _____

Nucleosides & Reagents

Unprotected Nucleosides

Modified Ribo Nucleosides

2,2'-Anhydro Cytidine-HCl (Beta-D-O2, 2'-Cyclocytidine Ancitabine)



Catalog#

RP-3765 _____

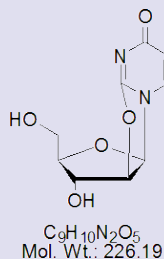
Pricing

\$ 35.00 / 1 gm _____

\$160.00 / 5 gm _____

Purity: 98% + _____

2,2'-Anhydro Uridine (Beta-D-O2, 2'-Cyclocouridine)



Catalog#

RP-4807 _____

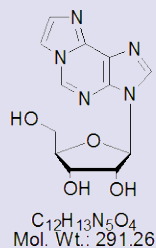
Pricing

\$ 30.00 / 1 gm _____

\$125.00 / 5 gm _____

Purity: 98% + _____

Etheno Adenosine



Catalog#

RP-2310 _____

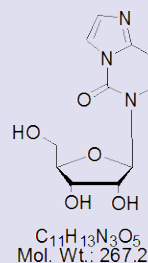
Pricing

\$ 38.00 / 25 mg _____

\$125.00 / 100 mg _____

Purity: 98% + _____

Etheno Cytidine



Catalog#

RP-2311 _____

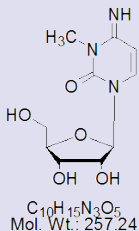
Pricing

\$ 34.00 / 25 mg _____

\$105.00 / 100 mg _____

Purity: 98% + _____

N³-Methyl Cytidine



Catalog#

RP-2317 _____

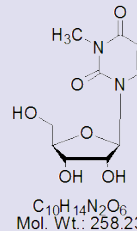
Pricing

\$115.00 / 25 mg _____

\$380.00 / 100 mg _____

Purity: 98% + _____

N³-Methyl Uridine



Catalog#

RP-1034 _____

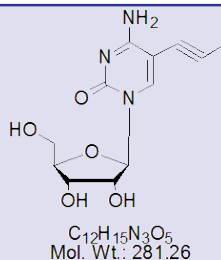
Pricing

\$ 65.00 / 25 mg _____

\$180.00 / 100 mg _____

Purity: 98% + _____

5-Propynyl Cytidine



Catalog#

RP-1546 _____

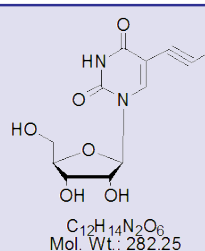
Pricing

\$150.00 / 10 mg _____

\$360.00 / 25 mg _____

Purity: 98% + _____

5-Propynyl ribo Uridine



Catalog#

RP-1842 _____

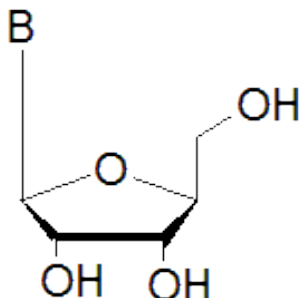
Pricing

\$ 90.00 / 100 mg _____

\$720.00 / 1 gm _____

Purity: 98% + _____

Unprotected Nucleosides

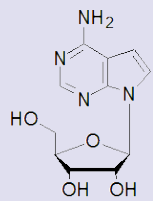


b-L Ribo Nucleosides

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	b-L Adenosine <i>M.W. 287.24</i>	\$65	\$110	\$285
RP-9032	b-L Cytidine <i>M.W. 243.22</i>	\$65	\$110	\$285
RP-9033	b-L Guanosine <i>M.W. 283.24</i>	\$78	\$122	\$326
RP-9034	b-L Uridine <i>M.W. 244.20</i>	\$65	\$110	\$285
RP-9035	b-L ribo Thymidine <i>M.W. 258.23</i>	\$75	\$112	\$310
RP-9036	b-L Inosine <i>M.W. 268.23</i>	\$78	\$122	\$326

7-Deaza Ribo Nucleosides

7-Deaza ribo Adenosine
(Tubercidin)

$C_{11}H_{14}N_4O_4$
Mol. Wt.: 266.25

Catalog#

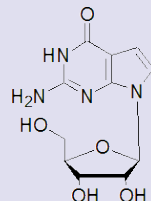
RP-2312

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#

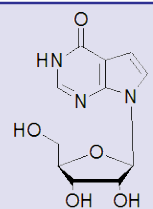
RP-2313

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% +

Nucleosides & Reagents

Unprotected Nucleosides

2'-O-Methyl Ribo Nucleosides

2'-(O-Methyl)-Adenosine

	Catalog# RP-1901 _____ Pricing \$.38.00 / 100 mg _____ \$.95.00 / 1 gm _____ \$880.00 / 10 gm _____ Purity: 98% + _____
$C_{11}H_{15}N_5O_4$ Mol. Wt.: 281.27	

2'-(O-Methyl)-Cytidine

	Catalog# RP-1902 _____ Pricing \$.38.00 / 100 mg _____ \$.95.00 / 1 gm _____ \$880.00 / 10 gm _____ Purity: 98% + _____
$C_{10}H_{15}N_3O_5$ Mol. Wt.: 257.24	

2'-(O-Methyl)-Guanosine

	Catalog# RP-1903 _____ Pricing \$.38.00 / 100 mg _____ \$.95.00 / 1 gm _____ \$880.00 / 10 gm _____ Purity: 98% + _____
$C_{11}H_{15}N_5O_5$ Mol. Wt.: 297.27	

2'-(O-Methyl)-Uridine

	Catalog# RP-1904 _____ Pricing \$.22.00 / 100 mg _____ \$.55.00 / 1 gm _____ \$480.00 / 10 gm _____ Purity: 98% + _____
$C_{10}H_{14}N_2O_6$ Mol. Wt.: 258.23	

2'-(O-Methyl)-Inosine

	Catalog# RP-1906 _____ Pricing \$.18.50 / 100 mg _____ \$162.00 / 1 gm _____ Purity: 98% + _____
$C_{11}H_{14}N_4O_5$ Mol. Wt.: 282.25	

2'-(O-Methyl)-5-Methyl Cytidine

	Catalog# RP-1907 _____ Pricing \$ 168.00 / 100 mg _____ \$1345.00 / 1 gm _____ Purity: 98% + _____
$C_{11}H_{17}N_3O_5$ Mol. Wt.: 271.27	

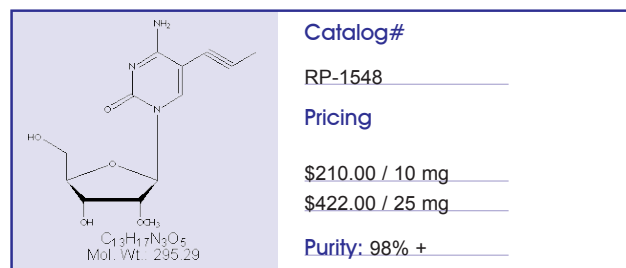
2'-(O-Methyl)-5-Iodo Uridine

	Catalog# RP-1905 _____ Pricing \$112.00 / 100 mg _____ \$600.00 / 1 gm _____ Purity: 98% + _____
$C_{10}H_{13}IN_2O_6$ Mol. Wt.: 384.12	

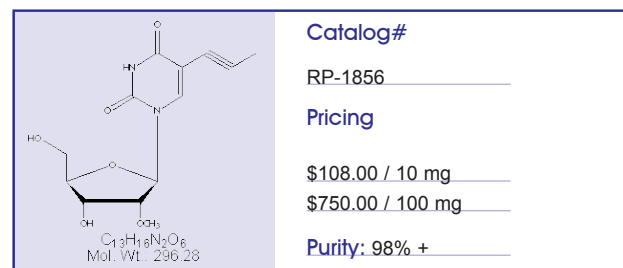
Unprotected Nucleosides

2'-O-Methyl Ribo Nucleosides

5-Propynyl-2'-(O-Methyl)-Cytidine

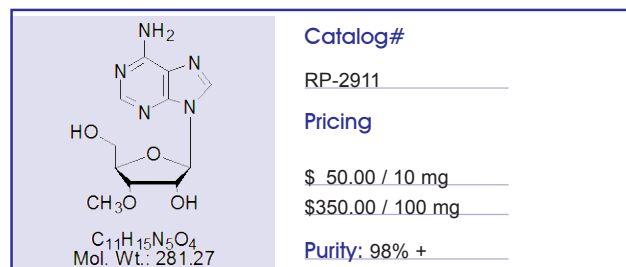


5-Propynyl-2'-(O-Methyl)-Uridine

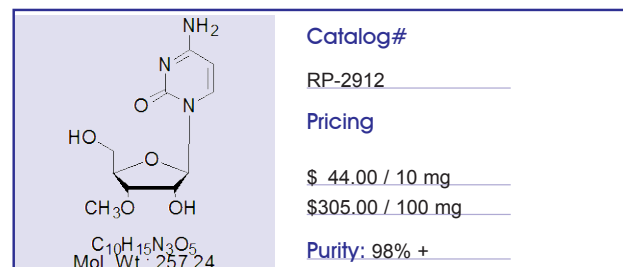


3'-O-Methyl Ribo Nucleosides

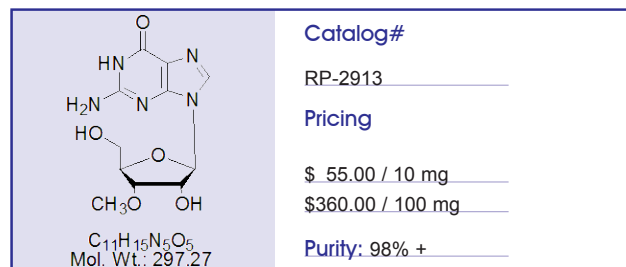
3'-(O-Methyl)-Adenosine



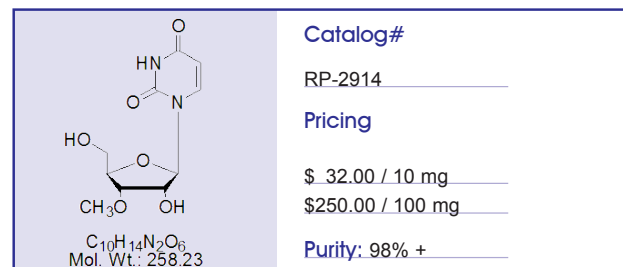
3'-(O-Methyl)-Cytidine



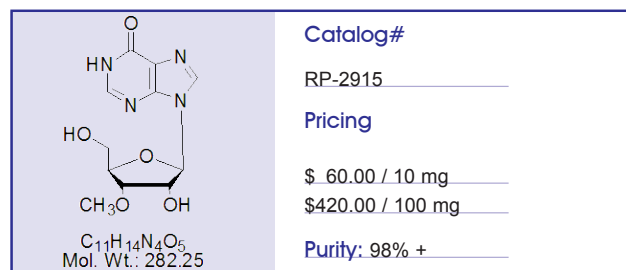
3'-(O-Methyl)-Guanosine



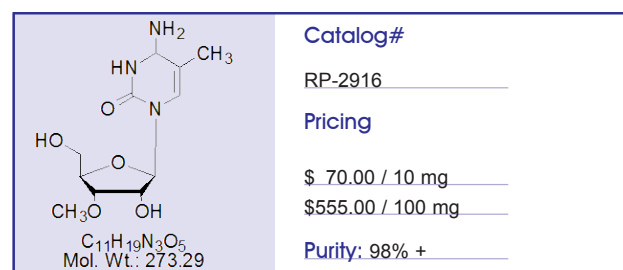
3'-(O-Methyl)-Uridine



3'-(O-Methyl)-Inosine



3'-(O-Methyl)-5-Methyl Cytidine

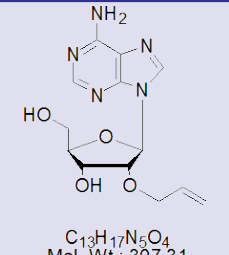


Nucleosides & Reagents

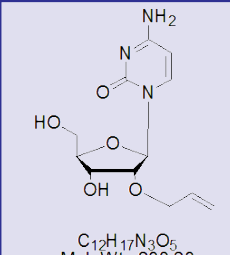
Unprotected Nucleosides

2'-O-Allyl Ribo Nucleosides

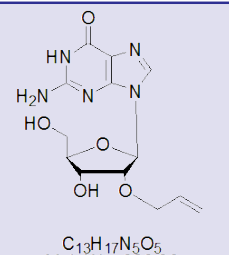
2'-(O-Allyl) Adenosine

 <chem>C13H17N5O4</chem> Mol. Wt.: 307.31	Catalog# RP-3511 _____ Pricing \$ 44.00 / 10 mg _____ \$308.00 / 100 mg _____ Purity: 98% + _____
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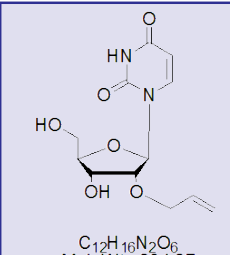
2'-(O-Allyl) Cytidine

 <chem>C12H17N3O5</chem> Mol. Wt.: 283.28	Catalog# RP-3512 _____ Pricing \$ 44.00 / 10 mg _____ \$308.00 / 100 mg _____ Purity: 98% + _____
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2'-(O-Allyl) Guanosine

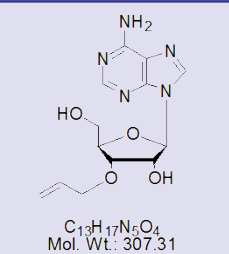
 <chem>C13H17N5O5</chem> Mol. Wt.: 323.30	Catalog# RP-3513 _____ Pricing \$ 44.00 / 10 mg _____ \$308.00 / 100 mg _____ Purity: 98% + _____
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2'-(O-Allyl) Uridine

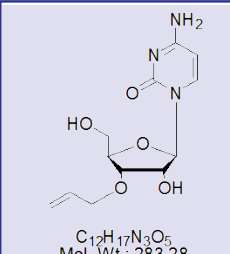
 <chem>C12H16N2O6</chem> Mol. Wt.: 284.27	Catalog# RP-3514 _____ Pricing \$ 38.00 / 10 mg _____ \$266.00 / 100 mg _____ Purity: 98% + _____
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3'-O-Allyl Ribo Nucleosides

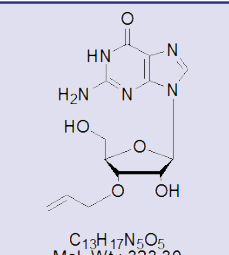
3'-(O-Allyl) Adenosine

 <chem>C13H17N5O4</chem> Mol. Wt.: 307.31	Catalog# RP-3111 _____ Pricing \$ 48.00 / 10 mg _____ \$336.00 / 100 mg _____ Purity: 98% + _____
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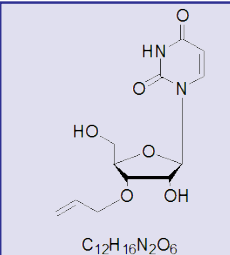
3'-(O-Allyl) Cytidine

 <chem>C12H17N3O5</chem> Mol. Wt.: 283.28	Catalog# RP-3112 _____ Pricing \$ 46.00 / 10 mg _____ \$322.00 / 100 mg _____ Purity: 98% + _____
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3'-(O-Allyl) Guanosine

 <chem>C13H17N5O5</chem> Mol. Wt.: 323.30	Catalog# RP-3113 _____ Pricing \$ 52.00 / 10 mg _____ \$364.00 / 100 mg _____ Purity: 98% + _____
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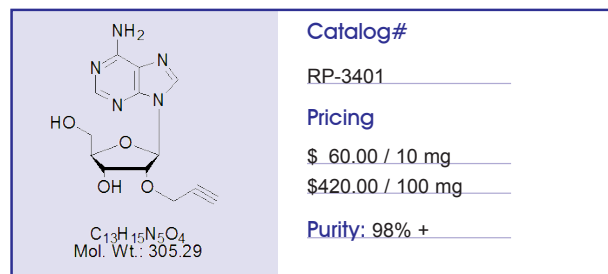
3'-(O-Allyl) Uridine

 <chem>C12H16N2O6</chem> Mol. Wt.: 284.27	Catalog# RP-3114 _____ Pricing \$ 46.00 / 10 mg _____ \$322.00 / 100 mg _____ Purity: 98% + _____
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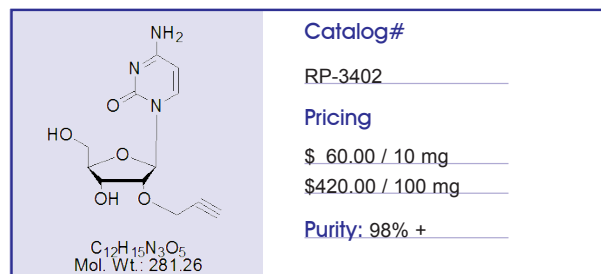
Unprotected Nucleosides

2'-O-Propargyl Ribo Nucleosides

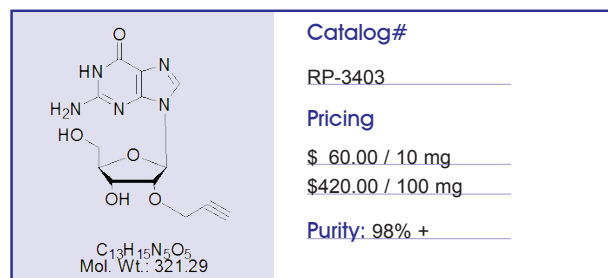
2'-(O-Propargyl) Adenosine



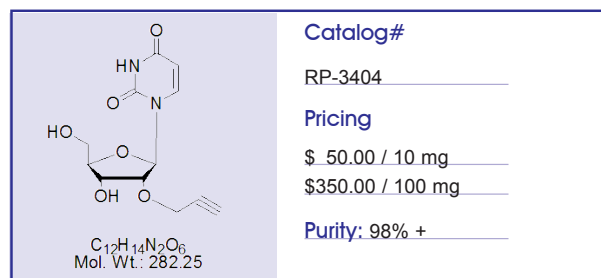
2'-(O-Propargyl) Cytidine



2'-(O-Propargyl) Guanosine

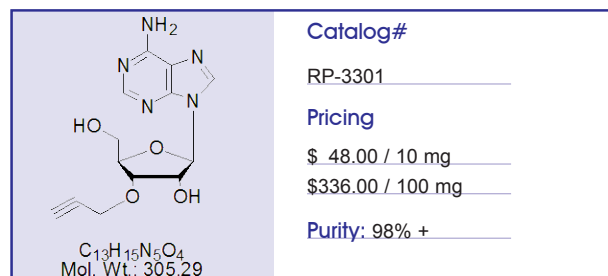


2'-(O-Propargyl) Uridine

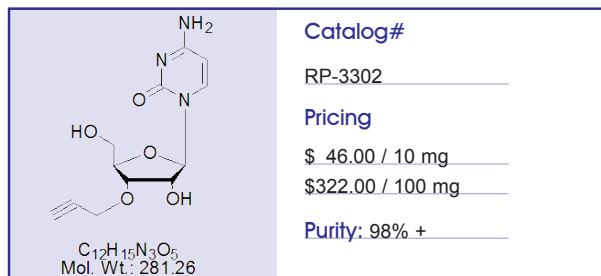


3'-O-Propargyl Ribo Nucleosides

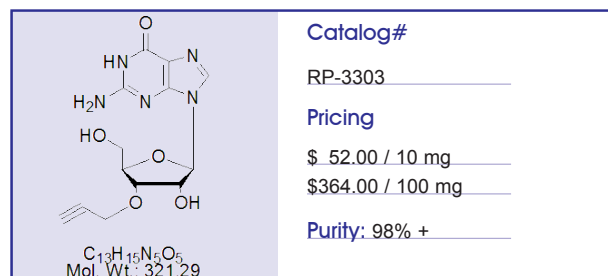
3'-(O-Propargyl) Adenosine



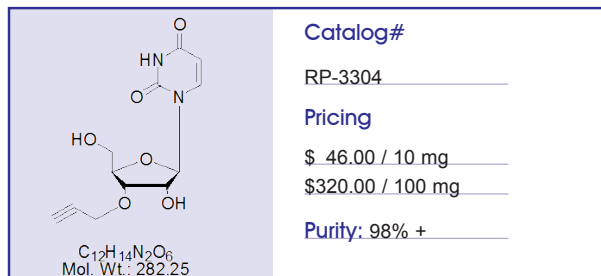
3'-(O-Propargyl) Cytidine



3'-(O-Propargyl) Guanosine

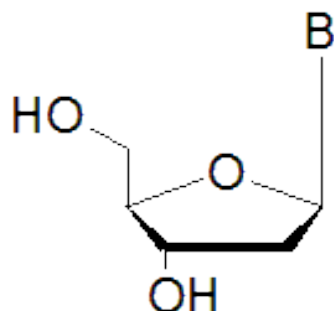


3'-(O-Propargyl) Uridine



Nucleosides & Reagents

N-protected Nucleosides

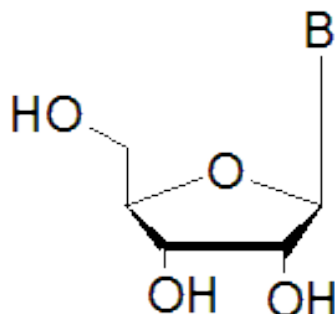


Base Protected (Standard & Labile) deoxy Nucleosides

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) <i>M.W. 355.35</i>	\$12	\$55	\$ 99
PM-1102	deoxy Cytidine (N-Bz) <i>M.W. 331.32</i>	\$12	\$55	\$ 99
PM-1103	deoxy Guanosine (N-iBu) <i>M.W. 337.33</i>	\$15	\$60	\$108
PM-1104	deoxy Cytidine (N-iBu) <i>M.W. 297.31</i>	\$15	\$70	\$126
PM-1105	deoxy Cytidine (N-Ac) <i>M.W. 269.25</i>	\$18	\$85	\$153
PM-9996	deoxy Adenosine (N-PAC) <i>M.W. 385.37</i>	\$22	\$82	\$148
PM-9997	deoxy Cytidine (N-PAC) <i>M.W. 361.35</i>	\$22	\$82	\$148
PM-9998	deoxy Guanosine (N-PAC) <i>M.W. 401.37</i>	\$22	\$82	\$148
PM-1588	deoxy Adenosine (N,N-DMF) <i>M.W. 306.32</i>	\$15	\$65	\$117
PM-3183	deoxy Guanosine (N,N-DMF) <i>M.W. 322.32</i>	\$15	\$65	\$117

N-protected Nucleosides



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) <i>M.W. 371.35</i>	\$27	\$125
PM-2102	Cytidine (N-Bz) <i>M.W. 347.32</i>	\$27	\$125
PM-2103	Guanosine (N-iBu) <i>M.W. 353.33</i>	\$33	\$130
PM-2105	Cytidine (N-iBu) <i>M.W. 313.31</i>	\$33	\$130
PM-2106	Cytidine (N-Ac) <i>M.W. 285.25</i>	\$37	\$155
PM-6001	Adenosine (N-PAC) <i>M.W. 401.37</i>	\$40	\$180
PM-6002	Cytidine (N-PAC) <i>M.W. 377.35</i>	\$40	\$180
PM-6003	Guanosine (N-PAC) <i>M.W. 417.37</i>	\$40	\$180

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

ribo Guanosine (N-phenyl acetyl)

Catalog#
PM-6004

Pricing
\$ 40.00 / 1 gm
\$180.00 / 5 gm

Purity: 98% +

$C_{18}H_{19}N_5O_6$
Mol. Wt.: 401.37

ribo isoGuanosine (N,N-diisobutylformadine)

Catalog#
PM-2643

Pricing
\$ 22.50 / 10 mg
\$165.00 / 100 mg
\$310.00 / 250 mg

Purity: 98% +

$C_{19}H_{30}N_6O_5$
Mol. Wt.: 422.48

5-Methyl Cytidine (N-Bz)

Catalog#
PM-4122

Pricing
\$ 32.00 / 25 mg
\$ 75.00 / 100 mg
\$455.00 / 1 gm

Purity: 98% +

$C_{17}H_{19}N_3O_6$
Mol. Wt.: 361.35

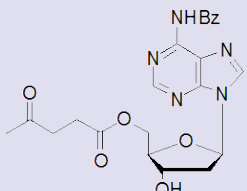
Nucleosides & Reagents

Levulinyl Protected Nucleosides

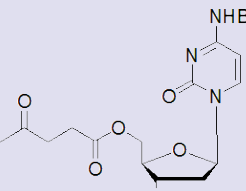
N-protected Nucleosides

5'-Levulinyl Nucleosides

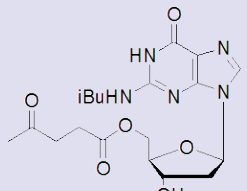
5'-Levulinyl deoxy Adenosine (N-Bz)

 $C_{22}H_{23}N_5O_6$ Mol. Wt.: 453.45	Catalog#
	DN-6601 _____
	Pricing
	\$ 40.00 / 1 gm _____ \$180.00 / 5 gm _____
	Purity: 98% + _____

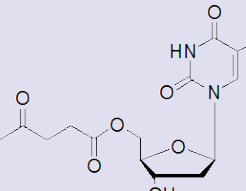
5'-Levulinyl deoxy Cytidine (N-Bz)

 $C_{21}H_{23}N_3O_7$ Mol. Wt.: 429.42	Catalog#
	DN-6602 _____
	Pricing
	\$ 40.00 / 1 gm _____ \$180.00 / 5 gm _____
	Purity: 98% + _____

5'-Levulinyl deoxy Guanosine (N-iBu)

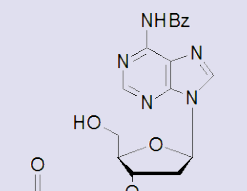
 $C_{19}H_{25}N_5O_7$ Mol. Wt.: 435.43	Catalog#
	DN-6603 _____
	Pricing
	\$ 40.00 / 1 gm _____ \$180.00 / 5 gm _____
	Purity: 98% + _____

5'-Levulinyl Thymidine

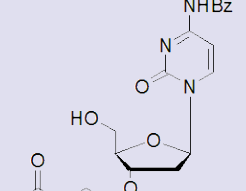
 $C_{15}H_{20}N_2O_7$ Mol. Wt.: 340.33	Catalog#
	DN-6604 _____
	Pricing
	\$ 35.00 / 1 gm _____ \$160.00 / 5 gm _____
	Purity: 98% + _____

3'-Levulinyl Nucleosides

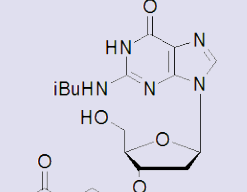
3'-Levulinyl deoxy Adenosine (N-Bz)

 $C_{22}H_{23}N_5O_6$ Mol. Wt.: 453.45	Catalog#
	PM-6611 _____
	Pricing
	\$100.00 / 1 gm _____ \$475.00 / 5 gm _____
	Purity: 98% + _____

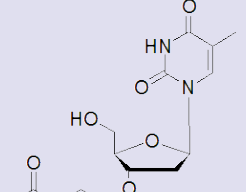
3'-Levulinyl deoxy Cytidine (N-Bz)

 $C_{21}H_{23}N_3O_7$ 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

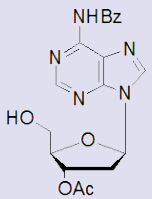
 $C_{15}H_{20}N_2O_7$ Mol. Wt.: 340.33	Catalog#
	PM-6614 _____
	Pricing
	\$ 90.00 / 1 gm _____ \$425.00 / 5 gm _____
	Purity: 98% + _____

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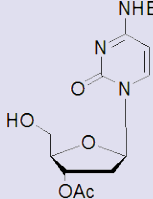
N-protected Nucleosides

Acetyl & Isopropylidene Ribo Nucleosides

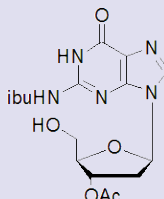
3'-(O-Acetyl) Adenosine (N-Bz)

 $C_{18}H_{19}N_5O_6$ Mol. Wt.: 397.38	Catalog#
	PM-6301 _____
	Pricing
	\$ 90.00 / 1 gm _____ \$425.00 / 5 gm _____ Purity: 98% + _____

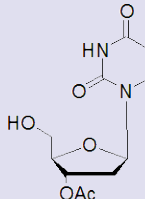
3'-(O-Acetyl) Cytidine (N-Bz)

 $C_{18}H_{19}N_3O_6$ Mol. Wt.: 373.36	Catalog#
	PM-6302 _____
	Pricing
	\$ 90.00 / 1 gm _____ \$425.00 / 5 gm _____ Purity: 98% + _____

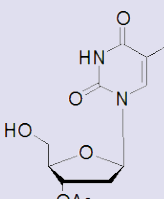
3'-(O-Acetyl) Guanosine (N-iBu)

 $C_{16}H_{21}N_5O_6$ Mol. Wt.: 379.37	Catalog#
	PM-6303 _____
	Pricing
	\$ 90.00 / 1 gm _____ \$425.00 / 5 gm _____ Purity: 98% + _____

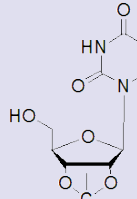
3'-(O-Acetyl) Uridine

 $C_{11}H_{14}N_2O_6$ Mol. Wt.: 270.24	Catalog#
	PM-6305 _____
	Pricing
	\$ 45.00 / 1 gm _____ \$212.00 / 5 gm _____ Purity: 98% + _____

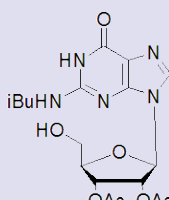
3'-(O-Acetyl) Thymidine

 $C_{12}H_{16}N_2O_6$ Mol. Wt.: 284.27	Catalog#
	PM-6304 _____
	Pricing
	\$ 45.00 / 1 gm _____ \$212.00 / 5 gm _____ Purity: 98% + _____

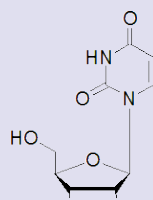
Uridine-2',3'-isopropylidene

 $C_{12}H_{16}N_2O_6$ Mol. Wt.: 284.27	Catalog#
	RP-4129 _____
	Pricing
	\$ 65.00 / 1 gm _____ \$260.00 / 5 gm _____ Purity: 98% + _____

2',3'-Diacetyl Guanosine (N-iBu)

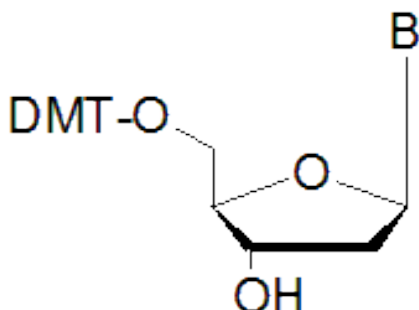
 $C_{18}H_{23}N_5O_8$ Mol. Wt.: 437.40	Catalog#
	RP-2282 _____
	Pricing
	\$ 90.00 / 1 gm _____ \$360.00 / 5 gm _____ Purity: 98% + _____

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% + _____

Nucleosides & Reagents

N-protected Nucleosides

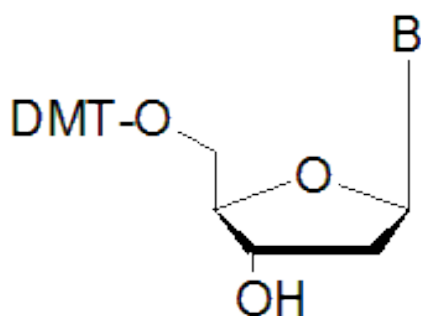


DMT Protected and base Protected (Standard & Labile) deoxy Nucleosides

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) <i>M.W. 657.71</i>	\$18	\$ 80	\$145	\$1,200
PM-1110	5'-DMT deoxy Cytidine (N-Bz) <i>M.W. 633.69</i>	\$18	\$ 80	\$145	\$1,200
PM-1111	5'-DMT deoxy Guanosine (N-iBu) <i>M.W. 639.70</i>	\$18	\$ 80	\$145	\$1,200
PM-1112	5'-DMT Thymidine <i>M.W. 544.60</i>	\$12	\$ 52	\$ 92	\$ 850
PM-1117	5'-DMT deoxy Cytidine (N-iBu) <i>M.W. 599.67</i>	\$18	\$ 80	\$145	\$1,200
PM-1118	5'-DMT deoxy Cytidine (N-Ac) <i>M.W. 571.82</i>	\$18	\$ 80	\$145	\$1,200
PM-3015	5'-DMT deoxy Adenosine (N-Ac) <i>M.W. 595.65</i>	\$25	\$112	\$198	\$1,782
PM-3101	5'-DMT deoxy Adenosine (N-PAC) <i>M.W. 687.74</i>	\$25	\$112	\$198	\$1,782
PM-3102	5'-DMT deoxy Cytidine (N-PAC) <i>M.W. 663.7</i>	\$25	\$112	\$198	\$1,782
PM-3103	5'-DMT deoxy Guanosine (N-PAC) <i>M.W. 703.74</i>	\$28	\$126	\$224	\$2,000
PM-1483 NEW!	5'-DMT deoxy Guanosine (N-tBPAC) <i>M.W. 759.85</i>	\$40	\$190	\$342	\$3,000
PM-1484 NEW!	5'-DMT deoxy Guanosine (N-isopropyl-PAC) <i>M.W. 745.82</i>	\$40	\$190	\$342	\$3,000

Purity: Ultrapure product: > 98.5% +

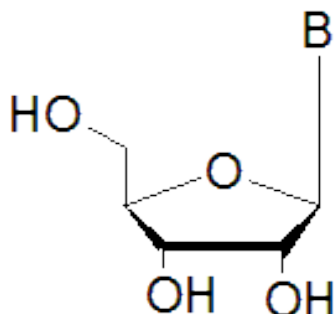


DMT Protected Labile Fmoc deoxy Nucleosides

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

N-protected Nucleosides

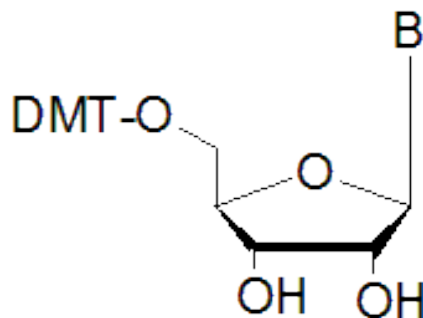


DMT Protected Standard & Labile Ribo Nucleosides

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) <i>M.W. 673.71</i>	\$33	\$142	\$256
PM-2110	5'-DMT Cytidine (N-Bz) <i>M.W. 649.69</i>	\$33	\$142	\$256
PM-2111	5'-DMT Guanosine (N-iBu) <i>M.W. 655.70</i>	\$35	\$148	\$265
PM-2112	5'-DMT Uridine <i>M.W. 546.57</i>	\$26	\$128	\$230
PM-2113	5'-DMT Cytidine (N-iBu) <i>M.W. 615.67</i>	\$40	\$142	\$333
PM-2114	5'-DMT Cytidine (N-Ac) <i>M.W. 587.82</i>	\$42	\$185	\$145
PM-2203	5'-DMT Adenosine (N-PAC) <i>M.W. 703.74</i>	\$35	\$148	\$245
PM-2204	5'-DMT Cytidine (N-PAC) <i>M.W. 679.72</i>	\$35	\$148	\$245
PM-2205	5'-DMT Guanosine (N-PAC) <i>M.W. 719.74</i>	\$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!

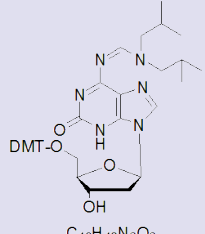
Catalog #	Product Name	1gm	5gm	10gm
PM-4366	5'-DMT-Ribo Adenosine (N-Fmoc)	\$25	\$112	\$198
PM-4367	5'-DMT-Ribo Cytidine (N-Fmoc)	\$25	\$112	\$198
PM-4368	5'-DMT-Ribo Guanosine (N-Fmoc)	\$25	\$112	\$198

Nucleosides & Reagents

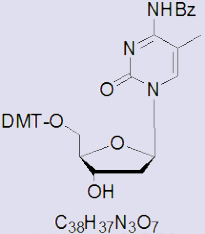
DMT-protected Nucleosides

DMT Protected Modified Deoxy Nucleosides

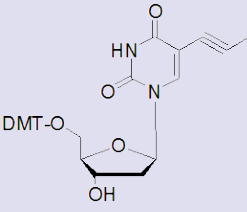
5'-DMT deoxy isoGuanosine (*N,N*-diisobutylformamide)

 <chem>C40H48N6O6</chem> Mol. Wt.: 708.85	Catalog#
	PM-1643
	Pricing
	\$425.00 / 1 gm
	Purity: 98% +

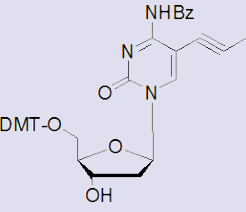
5'-DMT-5-Methyl deoxy Cytidine (*N*-Bz)

 <chem>C38H37N3O7</chem> Mol. Wt.: 647.72	Catalog#
	PM-1967
	Pricing
	\$ 45.00 / 1 gm \$200.00 / 5 gm
	Purity: 98% +

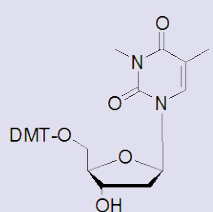
5'-DMT-5-Propynyl deoxy Uridine

 <chem>C33H32N2O7</chem> Mol. Wt.: 568.62	Catalog#
	PM-1022
	Pricing
	\$165.00 / 100 mg \$800.00 / 1 gm
	Purity: 98% +

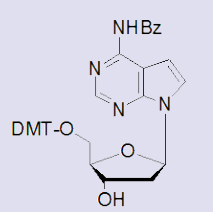
5'-DMT-5-Propynyl deoxy Cytidine (*N*-Bz)

 <chem>C40H37N3O7</chem> Mol. Wt.: 671.74	Catalog#
	PM-1124
	Pricing
	\$110.00 / 100 mg \$905.00 / 1 gm
	Purity: 98% +

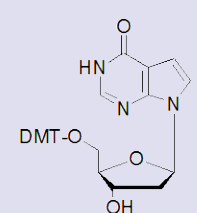
5'-DMT-³-Methyl Thymidine

 <chem>C32H34N2O7</chem> Mol. Wt.: 558.62	Catalog#
	PM-1591
	Pricing
	\$ 65.00 / 1 gm \$216.00 / 5 gm
	Purity: 98% +

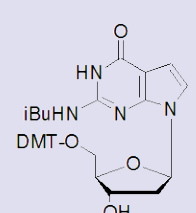
5'-DMT-7-deaza deoxy Adenosine (*N*-Bz)

 <chem>C39H36N4O6</chem> 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

 <chem>C32H31N3O6</chem> Mol. Wt.: 553.61	Catalog#
	PM-6434
	Pricing
	\$ 450.00 / 1 gm \$1,800.00 / 5 gm
	Purity: 98% +

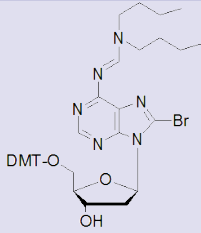
5'-DMT-7-deaza deoxy Guanosine (*N*-iBu)

 <chem>C36H38N4O7</chem> Mol. Wt.: 638.71	Catalog#
	PM-6433
	Pricing
	\$ 450.00 / 1 gm \$1,800.00 / 5 gm
	Purity: 98% +

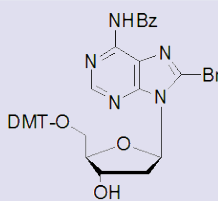
DMT-protected Nucleosides

DMT Protected Modified Deoxy Nucleosides

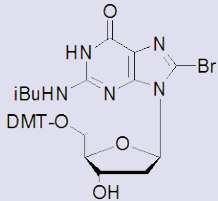
5'-DMT 8-Bromo deoxy Adenosine (*N,N*-dibuf)

 $C_{40}H_{47}BrN_5O_5$ Mol. Wt.: 771.74	Catalog#
	PM-4791
	Pricing
	\$165.00 / 1 gm \$650.00 / 5 gm Purity: 98% +

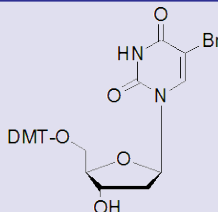
5'-DMT-8-Bromo deoxy Adenosine (*N*-Bz)

 $C_{38}H_{34}BrN_5O_6$ Mol. Wt.: 736.61	Catalog#
	PM-7210
	Pricing
	\$150.00 / 1 gm \$600.00 / 5 gm Purity: 98% +

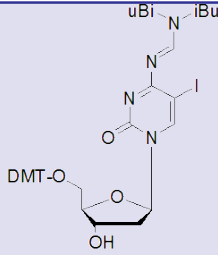
5'-DMT 8-Bromo deoxy Guanosine (*N*-iBu)

 $C_{35}H_{36}BrN_5O_7$ Mol. Wt.: 718.59	Catalog#
	PM-7211
	Pricing
	\$150.00 / 1 gm \$600.00 / 5 gm Purity: 98% +

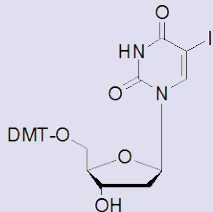
5'-DMT-5-Bromo deoxy Uridine

 $C_{30}H_{29}BrN_2O_7$ 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

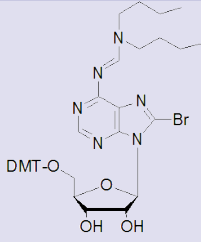
 $C_{30}H_{29}IN_2O_7$ Mol. Wt.: 656.47	Catalog#
	PM-2864
	Pricing
	\$ 45.00 / 1 gm \$186.00 / 5 gm Purity: 98% +

Nucleosides & Reagents

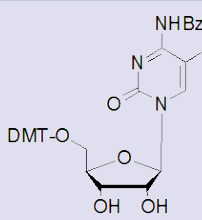
DMT-protected Nucleosides

DMT Protected Modified Ribo Nucleosides

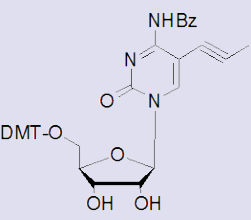
5'-DMT-8-Bromo Adenosine (*N,N*-dibutyl-dmf)

 <chem>C40H47BrN6O6</chem> Mol. Wt.: 787.74	Catalog#
	PM-1834
	Pricing
	\$160.00 / 1 gm
	Purity: 98% +

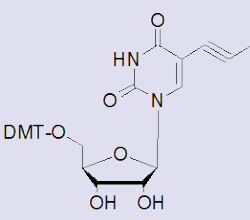
5'-DMT-5-Methyl Cytidine (*N*-Bz)

 <chem>C38H37N3O8</chem> Mol. Wt.: 663.72	Catalog#
	PM-2647
	Pricing
	\$134.00 / 1 gm
	Purity: 98% +

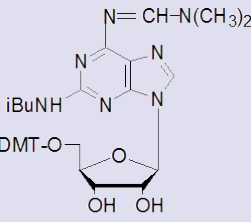
5'-DMT-5-Propynyl Cytidine (*N*-Bz)

 <chem>C40H37N3O8</chem> Mol. Wt.: 687.74	Catalog#
	PM-1126
	Pricing
	\$115.00 / 100 mg \$910.00 / 1 gm
	Purity: 98% +

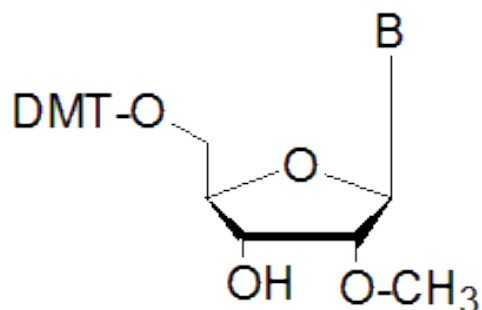
5'-DMT-5-Propynyl Uridine

 <chem>C33H32N2O8</chem> 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)

 <chem>C38H43N7O7</chem> Mol. Wt.: 709.79	Catalog#
	PM-2476
	Pricing
	\$115.00 / 1 gm
	Purity: 98% +

DMT-protected Nucleosides



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) <i>M.W. 687.74</i>	\$180	\$340
PM-5732	5'-O-DMT 2'-O-Methyl Cytidine (N-Bz) <i>M.W. 683.72</i>	\$150	\$280
PM-5733	5'-O-DMT 2'-O-Methyl Guanosine (N-iBu) <i>M.W. 669.72</i>	\$180	\$340
PM-5734	5'-O-DMT 2'-O-Methyl Uridine <i>M.W. 580.59</i>	\$150	\$280
PM-5735	5'-O-DMT 2'-O-Methyl Cytidine (N-Ac) <i>M.W. 601.65</i>	\$180	\$340
PM-3701	5'-O-DMT 2'-O-Methyl Adenosine (N-PAC) <i>M.W. 717.77</i>	\$195	\$355
PM-3702	5'-O-DMT 2'-O-Methyl Cytidine (N-PAC) <i>M.W. 693.74</i>	\$165	\$310
PM-3703	5'-O-DMT 2'-O-Methyl Guanosine (N-PAC) <i>M.W. 733.77</i>	\$195	\$355

Purity: Ultrapure products: Isomeric impurity undected by HPLC. _____

5'-DMT-5-Propynyl-2'-(O-Methyl) Uridine

Catalog#
 PM-1027 _____
Pricing
 \$375.00 / 100 mg _____
Purity: 98% + _____
 Isomeric impurity undected by HPLC.

$C_{34}H_{34}N_2O_8$
 Mol. Wt.: 598.64

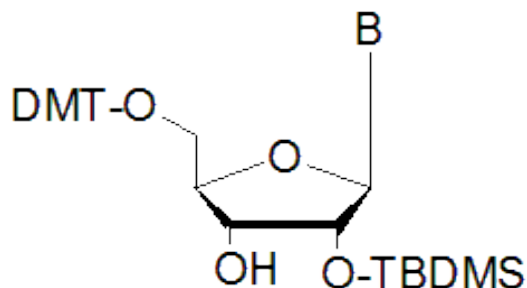
5'-DMT-5-Propynyl-2'-(O-Methyl) Cytidine (N-Bz)

Catalog#
 PM-1129 _____
Pricing
 \$1,300.00 / 100 mg _____
Purity: 98% + _____
 Isomeric impurity undected by HPLC.

$C_{41}H_{36}N_3O_8$
 Mol. Wt.: 701.76

Nucleosides & Reagents

DMT-protected Nucleosides



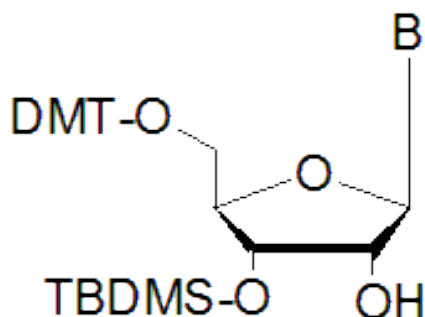
DMT Protected 2'-O-TBDMS Ribo Nucleosides

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) <i>M.W. 787.97</i>	\$75	\$356	\$675
PM-5852	5'-O-DMT 2'-O-TBDMS Cytidine (N-Bz) <i>M.W. 783.95</i>	\$75	\$356	\$675
PM-5853	5'-O-DMT 2'-O-TBDMS Guanosine (N-iBu) <i>M.W. 769.96</i>	\$95	\$555	\$845
PM-5854	5'-O-DMT 2'-O-TBDMS Uridine <i>M.W. 660.83</i>	\$75	\$356	\$675
PM-5855	5'-O-DMT 2'-O-TBDMS Inosine <i>M.W. 684.85</i>	\$98	\$451	\$845
PM-5856	5'-O-DMT 2'-O-TBDMS Cytidine (N-Ac) <i>M.W. 701.88</i>	\$95	\$555	\$845
PM-5857	5'-O-DMT 2'-O-TBDMS Adenosine (N,N-diBz) <i>M.W. 892.08</i>	\$95	\$555	\$845
PM-3501	5'-O-DMT 2'-O-TBDMS Adenosine (N-PAC) <i>M.W. 818.00</i>	\$83	\$380	\$700
PM-3502	5'-O-DMT 2'-O-TBDMS Cytidine (N-PAC) <i>M.W. 793.98</i>	\$83	\$380	\$700
PM-3503	5'-O-DMT 2'-O-TBDMS Guanosine (N-PAC) <i>M.W. 834.00</i>	\$93	\$388	\$705

Purity: 0% Isomeric Impurity. These are Ultrapure Products.

DMT-protected Nucleosides



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) <i>M.W. 787.97</i>	\$ 90	\$427
PM-5862	5'-O-DMT 3'-O-TBDMS Cytidine (N-Bz) <i>M.W. 783.95</i>	\$ 90	\$427
PM-5863	5'-O-DMT 3'-O-TBDMS Guanosine (N-iBu) <i>M.W. 769.96</i>	\$126	\$577
PM-5864	5'-O-DMT 3'-O-TBDMS Uridine <i>M.W. 660.83</i>	\$ 90	\$427

Purity: Ultrapure Products. Isomeric impurity undected by HPLC. _____

Unprotected Nucleosides N-protected Nucleosides

DMT-protected Nucleosides

Reagents

Triphosphates

NHS Esters

Nucleosides & Reagents

Phosphoramidite Chemistry Reagents

Activation Reagents

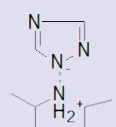
1,2,4-Triazole

 $C_2H_3N_3$ Mol. Wt.: 69.07	Catalog#	Pricing
	RN-1412	\$ 17.00 / 25 gm
		\$ 60.00 / 100 gm
		\$240.00 / 500 gm

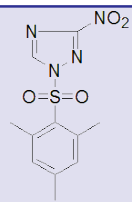
Dicyanoimidazole (DCI)

 $C_5H_2N_4$ 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

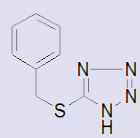
Diisopropyl Ammonium Tetrazolide

 $C_8H_{18}N_4$ 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

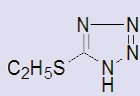
Mesitylene Sulphonyl-3-nitro-1,2,4-Triazole (MSNT)

 $C_{11}H_7N_4O_4S$ 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

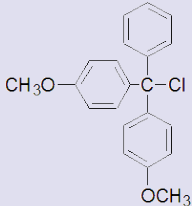
5-ethylthio-tetrazole has been demonstrated to be a superior coupling reagent for oligoribonucleotide synthesis. This reagent increases the stepwise coupling efficiency by 2-3% as compared to the conventional activator 1-H Tetrazole (*B. Sproat, F. Colonna, B. Mullah, D. Tsou, A. Andrus, A. Hampel, R. 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-ethylthio-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*).

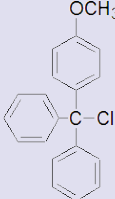
Phosphoramidite Chemistry Reagents

Bulk Production: Beaucage Reagents & DMT Chlorides

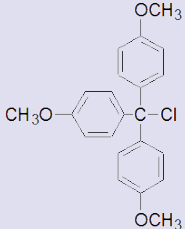
DMT-Chloride

 $C_{21}H_{19}ClO_2$ 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.

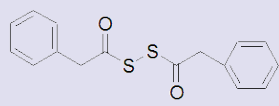
Reactivity: 1.2 equivalent reacts to produce colorless DMT-deoxynucleosides quantitatively.

Nucleosides & Reagents

Phosphoramidite Chemistry Reagents

Sulfurizing Reagent

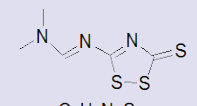
Phenylacetyl Disulfide (PADS)

 $C_{16}H_{14}O_2S_2$ Mol. Wt.: 302.41	Catalog#	Pricing
	RN-1496	\$26.50 / 5 gm \$108.00 / 25 gm

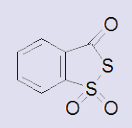
Silanized Bottle (for Beaucage Reagent)

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 literature¹⁻² and demonstrated high sulfurizing efficiency in oligonucleotide synthesis. ChemGenes is now offering an efficient sulfurizing reagent, DDTT³ 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 sulfurizing 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.

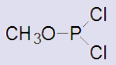
3. Patent Pending, AM Chemicals, LLC

* DDTT Sulfurizing solutions are listed on Ancillary Reagents Section, Page No. 17-23

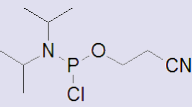
Phosphoramidite Chemistry Reagents

Phosphorylating Reagents

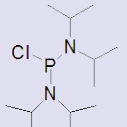
Dichloromethoxy phosphite

	Catalog#	Pricing
 <chem>CH3O-P(=O)(Cl)2</chem> $\text{CH}_3\text{Cl}_2\text{OP}$ Mol. Wt.: 132.91	RN-1407	\$18.00 / 1 gm
		\$84.00 / 5 gm

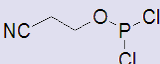
N,N-Diisopropylamino Cyanoethylphosphonamidic-chloride

	Catalog#	Pricing
 <chem>C9H18ClN2OP</chem> Mol. Wt.: 236.68	RN-1505	\$ 13.50 / 1 gm
		\$ 55.50 / 5 gm
		\$250.00 / 25 gm
		\$700.00 / 100 gm

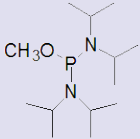
Bis (diisopropylamino) chlorophosphine

	Catalog#	Pricing
 <chem>C12H28ClN2P</chem> Mol. Wt.: 266.79	RN-8882	\$15.00 / 1 gm
		\$70.00 / 5 gm
		\$900.00 / 100 gm

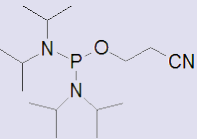
Cyanoethyl dichlorophosphite

	Catalog#	Pricing
 <chem>C3H4Cl2NOP</chem> Mol. Wt.: 171.95	RN-8883	\$16.00 / 1 gm
		\$75.00 / 5 gm

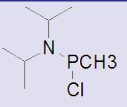
Methoxy N,N,N,N-tetraisopropylphosphane

	Catalog#	Pricing
 <chem>C13H31N2OP</chem> Mol. Wt.: 262.37	RN-8881	\$20.00 / 1 gm
		\$95.00 / 5 gm

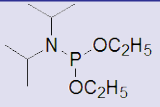
2-Cyanoethyl N,N,N,N-teraisopropyl phosphane

	Catalog#	Pricing
 <chem>C15H32N3OP</chem> Mol. Wt.: 301.41	RN-1545	\$ 12.00 / 1 gm
		\$ 40.00 / 5 gm
		\$550.00 / 100 gm

N,N-Diisopropylamino methylphosphonamidic-chloride

	Catalog#	Pricing
 <chem>C7H17ClNP</chem> Mol. Wt.: 181.64	RN-1510	\$135.00 / 5 gm
		\$980.00 / 50 gm

Diethoxy N,N-Diisopropyl phosphoramidite

	Catalog#	Pricing
 <chem>C10H24NO2P</chem> Mol. Wt.: 221.28	RN-1410	\$90.00 / 5 gm

Diethoxy N,N-Diisopropylphosphoramidite: A stable capping Reagent

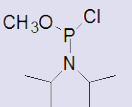
This reagent is utilized for capping directly during oligodeoxy-nucleotide synthesis by phosphoramidite method and avoids preparation of the commonly used, and rather unstable, Diethylphosphotriazolidine capping reagent.

Nucleosides & Reagents

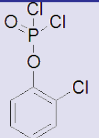
Phosphoramidite Chemistry Reagents

Phosphorylating Reagents

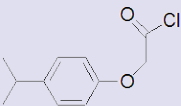
N,N-Diisopropyl methoxy phosphonamidic-Cl

 $C_7H_{17}ClNOP$ Mol. Wt.: 197.64	Catalog#	Pricing
	RN-1409	\$ 17.00 / 1 gm
		\$60.00 / 5 gm
		\$264.00 / 25 gm
		\$816.00 / 100 gm

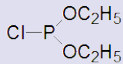
O-Chlorophenyl phosphorodichloridate

 $C_6H_4Cl_3O_2P$ Mol. Wt.: 245.43	Catalog#	Pricing
	RN-1421	\$30.00 / 5 gm
		\$91.00 / 25 gm

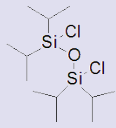
4-Isopropyl Phenoxy Acetyl Chloride

 $C_{11}H_{13}ClO_2$ Mol. Wt.: 212.67	Catalog#	Pricing
	RN-1705	\$15.00 / 1 gm
		\$70.00 / 5 gm

Diethyl phosphorochloride

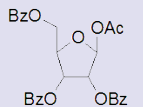
 $C_4H_{10}ClO_2P$ Mol. Wt.: 156.55	Catalog#	Pricing
	RN-1408	\$30.00 / 5 gm
		\$99.00 / 25 gm

Bis-Silylating Reagent

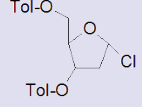
 $C_{12}H_{28}Cl_2OSi_2$ Mol. Wt.: 315.43	Catalog#	Pricing
	RN-1521	\$ 72.00 / 1 gm
		\$132.00 / 5 gm
		\$420.00 / 50 gm

Phosphoramidite Chemistry Reagents

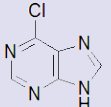
2,3,5-O-Tribenzoyl-D-Ribofuranosyl-1-Acetate

 $C_{28}H_{24}O_9$ Mol. Wt.: 504.48	Catalog#	Pricing
	RN-4131	\$ 44.00 / 5 gm \$150.00 / 25 gm

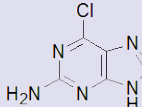
1-alpha-chloro-3,5-ditoluoyl-2-deoxy-D-ribose

 $C_{21}H_{21}O_5$ Mol. Wt.: 388.84	Catalog#	Pricing
	RN-4130	\$ 45.00 / 1 gm \$200.00 / 5 gm

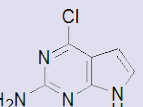
6-Chloro Purine

 $C_5H_3ClN_4$ Mol. Wt.: 154.56	Catalog#	Pricing
	RN-1030	\$20.00 / 1 gm \$80.00 / 5 gm

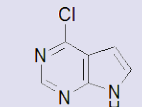
6-Chloro Guanine

 $C_5H_4ClN_5$ 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#	Pricing
	BS-1011	\$138.00 / 1 gm Purity: 98% +

6-Chloro-7-deaza Purine

 $C_6H_4ClN_3$ Mol. Wt.: 153.57	Catalog#	Pricing
	RP-1021	\$138.00 / 1 gm Purity: 98% +

Unprotected Nucleosides

DMT-protected Nucleosides

Reagents

Sugars

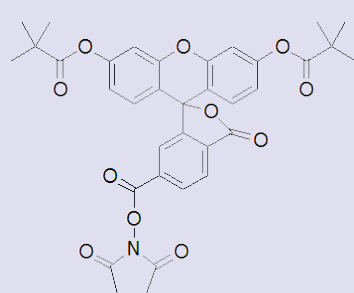
NHS Esters

Nucleosides & Reagents

Sugars & Purines for Synthesis

5 & 6 Fluoresceins

6-Fluorescein Dipivalate NHS Ester (6-FAM Dipivalate NHS Ester)



$C_{35}H_{31}NO_{11}$
Mol. Wt.: 641.62

Catalog#

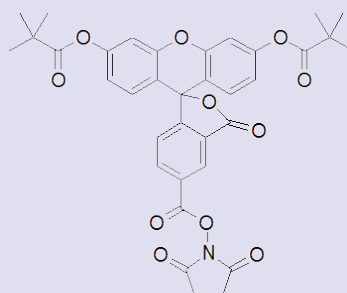
RN-9651

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#

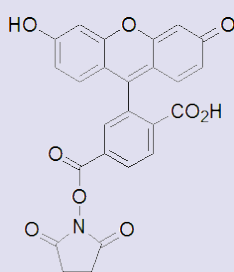
RN-9652

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#

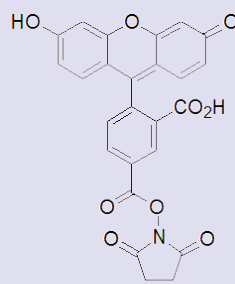
RN-9661

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

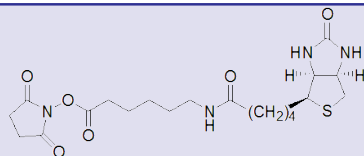
Pricing

\$ 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#

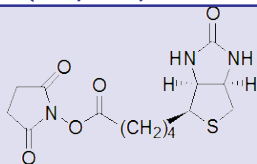
RN-1449

Pricing

\$12.00 / 25 mg

\$42.00 / 100 mg

Biotin Ester (N-Hydroxysuccinimide)



$C_{14}H_{19}N_3O_5S$
Mol. Wt.: 341.38

Catalog#

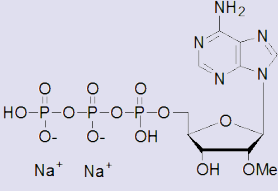
RN-1500

Pricing

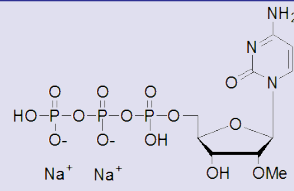
\$30.00 / 100 mg

5 & 6 Fluorescein NHS Esters

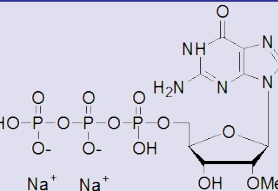
2'-(O-Methyl) Adenosine 5'-triphosphate disodium salt

Chemical Structure	Catalog#	Pricing
 <chem>C11H16N5Na2O13P3</chem> Mol. Wt.: 565.17	NTP-3386	\$ 71.50 / 1 mg (1 μ mole = 0.57 mg)
		\$126.50 / 2 mg (2 μ mole = 1.30 mg)
		\$308.00 / 5 mg (5 μ mole = 2.83 mg)
	Purity: 98% +	

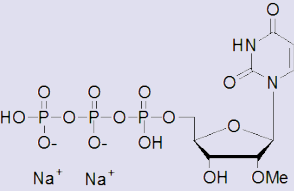
2'-(O-Methyl) Cytidine 5'-triphosphate disodium salt

Chemical Structure	Catalog#	Pricing
 <chem>C10H16N3Na2O14P3</chem> Mol. Wt.: 541.15	NTP-3387	\$ 71.50 / 1 mg (1 μ mole = 0.54 mg)
		\$126.50 / 2 mg (2 μ mole = 1.08 mg)
		\$308.00 / 5 mg (5 μ mole = 2.71 mg)
	Purity: 98% +	

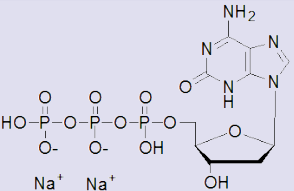
2'-(O-Methyl) Guanosine 5'-triphosphate disodium salt

Chemical Structure	Catalog#	Pricing
 <chem>C11H16N5Na2O14P3</chem> Mol. Wt.: 581.17	NTP-3388	\$ 71.50 / 1 mg (1 μ mole = 0.58 mg)
		\$126.50 / 2 mg (2 μ mole = 1.16 mg)
		\$308.00 / 5 mg (5 μ mole = 2.90 mg)
	Purity: 98% +	

2'-(O-Methyl) Uridine 5'-triphosphate disodium salt

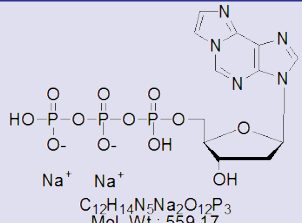
Chemical Structure	Catalog#	Pricing
 <chem>C10H15N2Na2O15P3</chem> Mol. Wt.: 542.13	NTP-3389	\$ 71.50 / 1 mg (1 μ mole = 0.54 mg)
		\$126.50 / 2 mg (2 μ mole = 1.08 mg)
		\$308.00 / 5 mg (5 μ mole = 2.71 mg)
	Purity: 98% +	

deoxy Isoguanosine 5'-triphosphate disodium salt

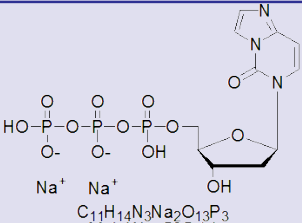
Chemical Structure	Catalog#	Pricing
 <chem>C10H14N5Na2O13P3</chem> Mol. Wt.: 551.14	NTP-4396	\$165.00 / 1 mg (1 μ mole = 0.55 mg)
		\$280.00 / 2 mg (2 μ mole = 1.10 mg)
		\$650.00 / 5 mg (5 μ mole = 2.76 mg)
	Purity: 98% +	

Triphosphates

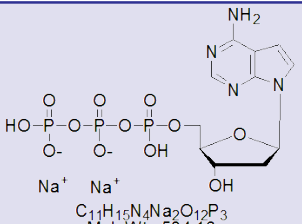
Etheno deoxy Adenosine 5'-triphosphate disodium salt

Chemical Structure	Catalog#	Pricing
 $\text{C}_{12}\text{H}_{14}\text{N}_5\text{Na}_2\text{O}_{12}\text{P}_3$ Mol. Wt.: 559.17	NTP-4344	\$165.00 / 1 mg (1 μ mole = 0.56 mg)
		\$310.00 / 2 mg (2 μ mole = 1.12 mg)
		\$645.00 / 5 mg (5 μ mole = 2.80 mg)
	Purity:	98% +

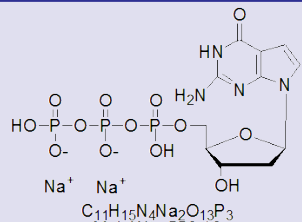
Etheno deoxy Cytidine 5'-triphosphate disodium salt

Chemical Structure	Catalog#	Pricing
 $\text{C}_{11}\text{H}_{14}\text{N}_3\text{Na}_2\text{O}_{13}\text{P}_3$ Mol. Wt.: 535.14	NTP-4346	\$165.00 / 1 mg (1 μ mole = 0.54 mg)
		\$310.00 / 2 mg (2 μ mole = 1.07 mg)
		\$645.00 / 5 mg (5 μ mole = 2.68 mg)
	Purity:	98% +

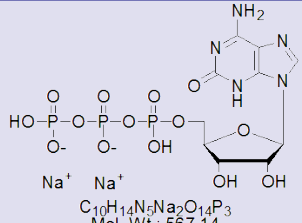
7-deaza deoxy Adenosine 5'-triphosphate disodium salt

Chemical Structure	Catalog#	Pricing
 $\text{C}_{11}\text{H}_{15}\text{N}_4\text{Na}_2\text{O}_{12}\text{P}_3$ Mol. Wt.: 534.16	NTP-4384	\$153.00 / 1 mg (1 μ mole = 0.53 mg)
		\$275.00 / 2 mg (2 μ mole = 1.07 mg)
		\$650.00 / 5 mg (5 μ mole = 2.67 mg)
	Purity:	98% +

7-deaza deoxy Guanosine 5'-triphosphate disodium salt

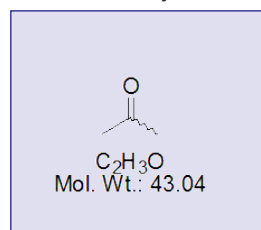
Chemical Structure	Catalog#	Pricing
 $\text{C}_{11}\text{H}_{15}\text{N}_4\text{Na}_2\text{O}_{13}\text{P}_3$ Mol. Wt.: 550.16	NTP-4386	\$153.00 / 1 mg (1 μ mole = 0.55 mg)
		\$275.00 / 2 mg (2 μ mole = 1.10 mg)
		\$650.00 / 5 mg (5 μ mole = 2.75 mg)
	Purity:	98% +

isoguanosine 5'-triphosphate disodium salt

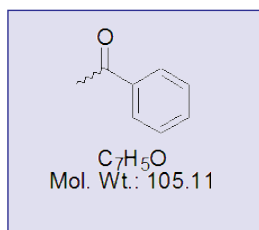
Chemical Structure	Catalog#	Pricing
 $\text{C}_{10}\text{H}_{14}\text{N}_5\text{Na}_2\text{O}_{14}\text{P}_3$ Mol. Wt.: 567.14	NTP-4348	\$165.00 / 1 mg (1 μ mole = 0.57 mg)
		\$280.00 / 2 mg (2 μ mole = 1.13 mg)
		\$680.00 / 5 mg (5 μ mole = 2.84 mg)
	Purity:	98% +

Common Abbreviations

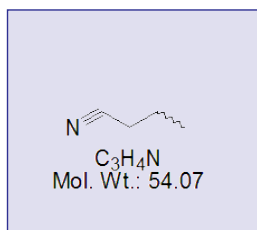
Acetyl



Bz Benzoyl

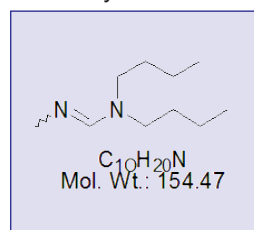


CE Cyanoethyl



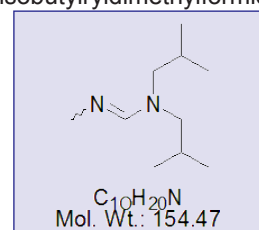
DBF

Di-N-butylformamidine



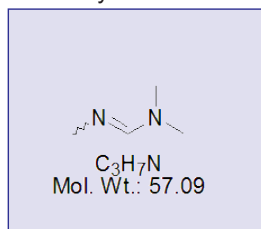
DIBF

diisobutylryldimethylformidine



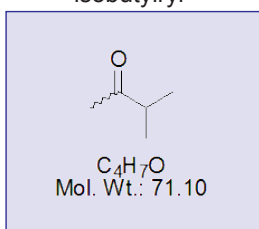
DMF

Dimethylformamide



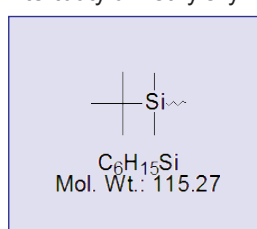
iBu

isobutylryl



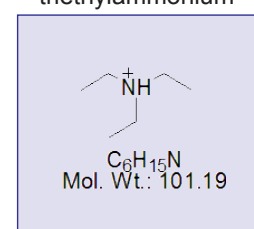
O-TBDMS

tertbutyldimethylsilyl



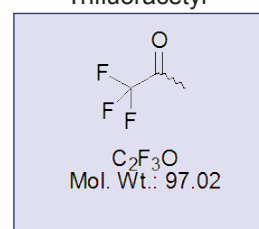
TEA

triethylammonium



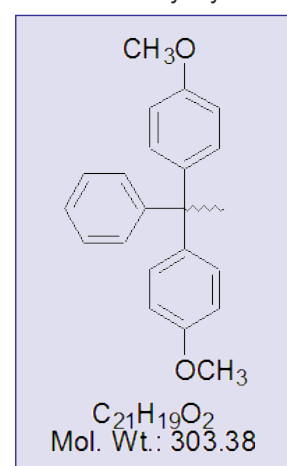
TFA

Trifluoroacetyl



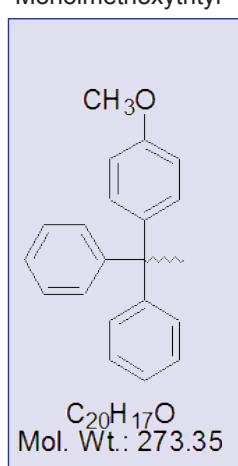
DMT

Dimethoxytrityl



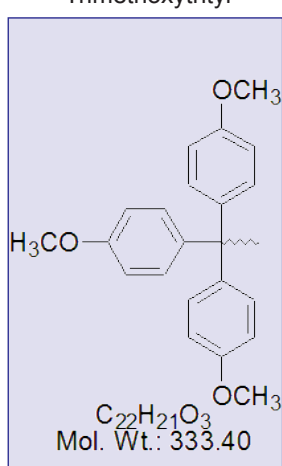
MMT

Monoimethoxytrityl

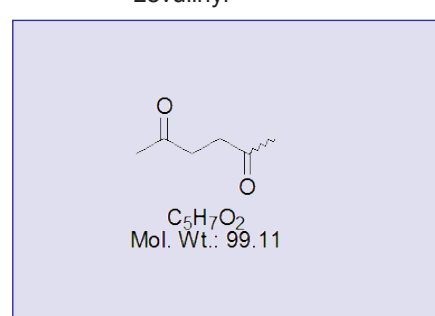


TMT

Trimethoxytrityl



Levulinyl



THF=tetrahydrofuran

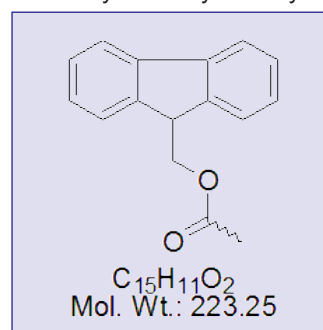
lcaa= long chain alkylamino

CPG=Control Pore Glass

AMA=ammonium methyl amine(aq)

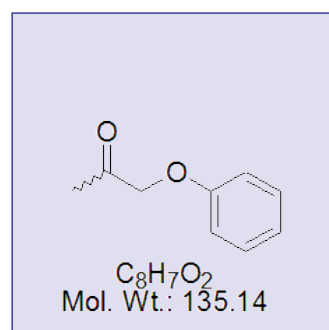
Fmoc

Fluorenylmethoxycarbonyl



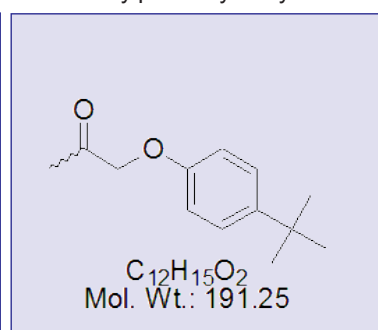
PAC

Phenoxyacetyl



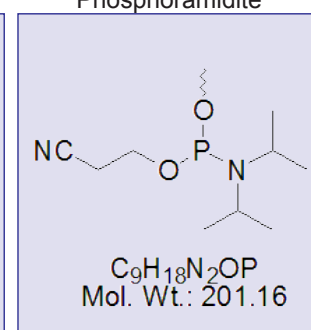
tBPAC

tert-butylphenoxyacetyl



CEP

O-Cyanoethyl-N,N-diisopropyl Phosphoramidite



#

2'-5'-Linkage RNA Amidites: 60

A

Abasic Amidites: 40

ABI Oligonucleotide Synthesizer Ancillary Reagents: 18,19

Acetonitrile:

Acetonitrile (wash): 17-23

Acetonitrile Anhydrous (Phosphoramidite diluent, Synthesis grade): 17-23

Acetonitrile/Pyridine (50:50), Anhydrous (H-Phosphonate Chemistry): 17

Acetonitrile/Pyridine (95:5), Anhydrous (H-Phosphonate Chemistry): 17

Acetonitrile/Pyridine (Wash solvent for H-Phosphonate Chemistry): 17

3'-(O-acetyl)-deoxy A (N-Bz), C (N-Bz), G (N-Bu), T, & U: 124 Activation

Reagents:

Activation Reagent: 17-23

Activator for H-phosphonate monomers and Capping Reagent: 17

Akta Oligonucleotide Synthesizer Ancillary Reagents: 20

Adenosine modifications:

alpha-deoxy Adenosine: 117

DMT-alpha-deoxy Adenosine (N-Bz) amidite: 27

2-Amino deoxy Adenosine Amidite & CPG: 36

2-Amino-O-TBDMS Adenosine Amidite & CPG: 66

araAdenosine (N-Bz) Amidite & CPG: 29

N6-Benzyl-O-TBDMS Adenosine Amidite & CPG: 63

8-Bromo-deoxy Adenosine mononucleoside: 118

8-Bromo-deoxy Adenosine (N-Bz) Amidite & CPG: 33

8-Bromo-deoxy Adenosine (n,n-isobutyl) Amidite & CPG: 33

8-Bromo-ribo Adenosine mononucleoside: 124

8-Bromo-O-TBDMS Adenosine (n,n-dibutyl) Amidite & CPG: 68

5'-DMT 8-Bromo deoxy Adenosine (n,n-dibutyl) mononucleoside: 138

5'-DMT 8-Bromo deoxy Adenosine (N-Bz) mononucleoside: 138

5'-DMT 8-Bromo ribo Adenosine (n,n-dibutyl) mononucleoside: 139

2'-(O-butyl) Adenosine (N-Bz) 3'-succinyl Icaa CPG: 111

2'-(O-butyl) Adenosine (N-Bz) amidite: 111

7-Deaza-7-Iodo deoxy Adenosine mononucleoside: 122

7-Deaza-7-Iodo deoxy Adenosine (N,N-Dmf) amidite: 31

7-Deaza-7-Iodo 2'-(O-Methyl) Adenosine (N-Bz) amidite: 103

7-Deaza-7-propargyl 2'-(O-Methyl) Adenosine (N-Bz) phosphoramidite:

103 7-Deaza deoxy Adenosine mononucleoside: 122

7-Deaza deoxy Adenosine (N-Bz) amidite: 30

7-Deaza deoxy Adenosine (N,N-Dmf) 7-propargyl phosphoramidite:

31 7-Deaza deoxy Adenosine (N-Bz) 3'-succinyl Icaa CPG: 30

7-Deaza deoxy Adenosine 5'-triphosphate disodium salt: 151

7-Deaza 2',3'-dideoxy Adenosine: 122

7-Deaza ribo Adenosine mononucleoside: 126

7-Deaza-2'-O-TBDMS Adenosine (N-Bz) amidite: 69

7-Deaza 3'-O-TBDMS Adenosine (N-Bz) 2'-succinyl Icaa CPG:

69 7-Deaza-2'-(O-Methyl) Adenosine (N-Bz) amidite: 103

5'-DMT-7-Deaza deoxy Adenosine (N-Bz) mononucleoside: 137

dideoxy Adenosine: 117

2',3'-dideoxy Adenosine 5'-amidite: 41

2',3'-dideoxy Adenosine n-succinyl Icaa CPG: 41

Ethno deoxy Adenosine: 118

Ethno deoxy Adenosine 3'-succinyl Icaa CPG: 90

Ethno deoxy Adenosine phosphoramidite: 90

Ethno deoxy Adenosine 5-triphosphate disodium salt: 151

Ethno ribo Adenosine: 125

Ethno ribo Adenosine 2'/3'-succinyl Icaa CPG: 90

Ethno-2'-O-TBDMS Adenosine phosphoramidite: 90

N6-Isopentenyl-O-TBDMS Adenosine Amidite & CPG:

63 **Beta-L-deoxy Adenosine: 120**

Beta-L-deoxy Adenosine (N-Bz) 3'-succinyl Icaa CPG: 39

Beta-L-deoxy Adenosine (N-Bz) amidite: 38

Beta-L-ribo Adenosine: 126

Beta-L-2'-O-TBDMS Adenosine (N-Bz) 3'-amidite: 71

Beta-L-3'-O-TBDMS Adenosine (N-Bz) 2'-succinyl Icaa CPG: 72

5'-OH 3'-Levulinyl deoxy Adenosine (N-Bz): 133

5'-Levulinyl-deoxy Adenosine (N-Bz): 133

5'-Levulinyl deoxy Adenosine (N-Bz) amidite: 14

N1-Methyl deoxyAdenosine mononucleoside: 119

N1-Methyl-deoxyAdenosine (n-fmoc)Amidite & CPG: 34, 35

8-Oxo deoxy Adenosine (N-Bz) Amidite & CPG: 40

2'-(O-Methyl) Adenosine 5'-triphosphate disodium salt: 150

7-Deaza deoxy Adenosine 5'-triphosphate disodium salt: 151

Ethno deoxy Adenosine 5'-triphosphate disodium salt: 151

deoxy Adenosine monohydrate: 116

Common deoxy Adenosine mononucleosides:

deoxy Adenosine (N-Bz) mononucleoside: 131

deoxyAdenosine (N-PAC) mononucleoside: 131

deoxy Adenosine (N,N-DMF) mononucleoside: 131

5'-DMT deoxy Adenosine (N-Ac) mononucleoside: 135

5'-DMT deoxy Adenosine (N-Bz) mononucleoside: 135

5'-DMT deoxy Adenosine (N-PAC) mononucleoside: 135

3'-(O-acetyl) Adenosine (N-Bz): 134

Common ribo Adenosine mononucleosides:

ribo Adenosine: 123

ribo Adenosine (N-Bz) mononucleoside: 132

ribo Adenosine (N-PAC) mononucleoside: 132

5'-DMT ribo Adenosine (N-Bz) mononucleoside: 136

5'-DMT ribo Adenosine (N-PAC) mononucleoside: 136

5'-DMT 2'-(O-Methyl) Adenosine (N-Bz) mononucleoside: 140

5'-DMT 2'-(O-Methyl) Adenosine (N-PAC) mononucleoside: 140

5'-DMT-2'-O-TBDMS Adenosine (N-Bz) mononucleoside: 141

5'-DMT-2'-O-TBDMS Adenosine (n,n-dibz) mononucleoside: 141

5'-DMT-2'-O-TBDMS Adenosine (N-PAC) mononucleoside: 141

5'-DMT-3'-O-TBDMS Adenosine (N-Bz) mononucleoside: 142

2'-(O-allyl) Adenosine: 129

2'-(O-Methyl) Adenosine mononucleoside: 127

2'-(O-Methyl) RNA amidites 98

3'-Azido 3'-deoxy Thymidine 121

2'-(O-Propargyl) Adenosine mononucleoside: 130

3'-(O-allyl) Adenosine: 129

3'-(O-Methyl) Adenosine mononucleoside: 128

3'-(O-Propargyl) Adenosine mononucleoside: 130

Common deoxy Adenosine for Oligo Synthesis:

deoxyAdenosine (N-Bz) 3'-succinyl Polystyrene: 11

deoxy Adenosine (N-Bz) 3'-non-cleavable long chain spacer: 12

deoxy Adenosine (N-PAC) 3'-oxalyl Icaa CPG: 107

deoxy Adenosine (N-Bz) 3'-succinyl Icaa CPG: 4

deoxy Adenosine (N-PAC) 3'-succinyl Icaa CPG: 6

deoxy Adenosine (N-Bz) P-O-benzyl phosphoramidite: 9

deoxy Adenosine (N-Bz) amidite: 2

deoxy Adenosine (N-PAC) amidite: 5,7

deoxy Adenosine (N-Bz) p-ethoxy phosphoramidite: 106

deoxy Adenosine (N-PAC) p-ethoxy phosphoramidite: 106

deoxy Adenosine (N-Bz) H-phosphonate TEA Salt: 15

deoxyAdenosine (N-Bz) p-isopropoxy phosphoramidite: 110

deoxy Adenosine (N-Bz) p-methoxy phosphoramidite: 8

deoxy Adenosine (N-PAC) p-methoxy phosphoramidite: 110

deoxy Adenosine (N-Bz) p-methyl phosphoramidite: 108

3'-deoxy Adenosine (N-Bz) (Cordycepin) 2'-Amidite & CPG: 29

3'-DMT deoxy Adenosine (N-Bz) 5'-Amidite & CPG: 10

Common ribo Adenosine for Oligo Synthesis:

3'-O-TBDMS Adenosine (*N*-Bz) 2'-succinyl Polystyrene: 53
 3'-O-TBDMS Adenosine (*N*-PAC) 2'-oxalyl Icaa CPG: 52
 3'-O-TBDMS Adenosine (*N*-Bz) 2'-succinyl Icaa CPG: 50
 3'-O-TBDMS Adenosine (*N*-PAC) 2'-succinyl Icaa CPG: 50
 2'-O-TBDMS Adenosine (*N*-Ac) amidite: 49
 2'-O-TBDMS Adenosine (*N*-Bz) amidite: 49
 2'-O-TBDMS Adenosine (*N*-PAC) amidite: 51
 2'-O-TBDMS Adenosine (*N*-Bz) p-methoxy phosphoramidite: 54
 2'-O-TBDMS Adenosine (*N*-PAC) p-methoxy phosphoramidite: 54
 3'-O-TBDMS Adenosine (*N*-Bz) phosphoramidite (Reverse Amidite): 60
 2'-(O-Methyl) p-ethoxy Adenosine (*N*-Bz) phosphoramidite: 104
 2'-(O-Methyl) Adenosine (*N*-Bz) p-methyl phosphoramidite: 109
 2'-(O-Propargyl) Adenosine (*N*-Bz) phosphoramidite & support: 112
 3'-(O-Methyl) Adenosine (*N*-Bz) phosphoramidite & support: 105
 3'-(O-Propargyl) Adenosine (*N*-Bz) phosphoramidite & support: 113
 3'-DMT-2'-(O-Methyl) Adenosine (*N*-Bz) 5'-amidite & support: 114, 115
2' & 3'-(O-allyl) A, C, G, & U: 129
Alpha-deoxy A, C, G, & T nucleosides: 117
Alpha-deoxy A (*N*-Bz), C (*N*-Bz), G (*N*-iBu), & T Amidites: 27
AMA Reagent: 17-23
Ammonia Free Oligo Deprotection Solution: 52, 107
2-Amino deoxy Adenosine Amidite & CPG: 36
2-Amino-O-TBDMS Adenosine Amidite & CPG: 66
2-Amino deoxy Purine Amidite & CPG: 36
3'-TFA Amino deoxy Cytidine 5'-phosphoramidite: 28
3'-TFA Amino deoxy Uridine 5'-phosphoramidite: 28
5'-Amino Thymidine phosphoramidite: 28
5'-Amino Thymidine 3'-Amidite & CPG: 28
Amino Icaa CPG: 3
Amino Modifiers:
 TFA-Amino C-4 phosphoramidite: 78
 TFA-Amino C-5 phosphoramidite: 78
 MMT-Amino C-6 phosphoramidite: 78
 TFA-Amino C-6 phosphoramidite: 78
 MMT-Amino C-12 phosphoramidite: 80
 TFA-Amino C-12 phosphoramidite: 80
 3'-Amino Modifier C-3 Support: 81
 3'-Amino Modifier TFA-Amino C-6 Support: 81
 Amino dT (C-6) 3'-Amidite & CPG: 81
 Amino Modifier 2'-(O-Methyl) Cytidine phosphoramidite: 102
 Amino Modifier 2'-(O-Methyl) Uridine phosphoramidite: 102
 Fmoc-Amino-DMT C-3 phosphoramidite: 81
 deoxy Cytidine N4-Amino Linker phosphoramidite: 79
 deoxy Cytidine N4-Amino Linker 3'-CPG: 81
2-Amino Purine Riboside Amidite & CPG: 66
2'-Amino TFA Cytidine (*N*-Bz) 3'-phosphoramidite: 65
2'-Amino TFA Uridine 3'-Amidite & CPG: 65
Ancitabine: 125
2,2'-Anhydro Cytidine-HCl: 125
2,2'-Anhydro Uridine: 125
2,2'-Anhydro Uridine Amidite & CPG: 62
Anhydrous Ammonia (in Ethanol): 74
araAdenosine (*N*-Bz) Amidite & CPG: 31
araCytidine (*N*-Bz) Amidite & CPG: 31
Asymmetrical Branching Amidite & CPG: 87
5-aza deoxy Cytidine: 121

B

Barrels for Purification: 46
Beaucage Reagent (Sulfurizing Reagent): 17-23,145
Beckman Synthesizer Ancillary Reagents: 19

P-O-benzyl phosphoramidites: 9

5-benzylthio tetrazole: 143

BioSearch Synthesizer Ancillary Reagents: 20

Biotin:

Biotin (t-butyl-bz) Amidite & CPG: 86
 Biotin-Amido Caproate-N-Hydroxy: 149
 Biotin Ester (N-Hydroxysuccinimide): 149
 Biotin Thymidine phosphoramidite: 86

Branching Amidites & Supports: 87

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5-Bromo-deoxy Cytidine mononucleoside: 118
 5-Bromo-ribo Cytidine mononucleoside: 124
 5-Bromo-ribo Uridine mononucleoside: 124
 5-Bromo-deoxy Uridine mononucleoside: 118
 5-Bromo-deoxy Cytidine (*N*-Bz) Amidite & CPG: 32, 33
 5-Bromo-deoxy Uridine Amidite & CPG: 32, 32
 5-Bromo 2'-(O-Methyl) Uridine Amidite & CPG: 101, 102
 5-Bromo-O-TBDMS Cytidine (*N*-Bz) Amidite & CPG: 68, 69
 5-Bromo-O-TBDMS Uridine Amidite & CPG: 69, 69
 8-Bromo-deoxy Adenosine mononucleoside: 118
 8-Bromo-deoxy Guanosine mononucleoside: 118
 8-Bromo-ribo Adenosine mononucleoside: 124
 8-Bromo-ribo Guanosine mononucleoside: 124
 8-Bromo-deoxy Adenosine (*N*-Bz) Amidite & CPG: 33
 8-Bromo-deoxy Adenosine (n,n-isobudmf) Amidite & CPG: 33
 8-Bromo-deoxy Guanosine (*N*-iBu) Amidite & CPG: 34, 33
 8-Bromo-O-TBDMS Adenosine (n,n-dibuf) Amidite & CPG: 69
 5'-DMT 8-Bromo deoxy Adenosine (*N*-Bz) mononucleoside: 138
 5'-DMT 8-Bromo deoxy Adenosine (n,n-dibuf) mononucleoside: 138
 5'-DMT 8-Bromo deoxy Guanosine (*N*-iBu) mononucleoside: 138
 5'-DMT 5-Bromo deoxy Uridine mononucleoside: 138
 5'-DMT 8-Bromo ribo Adenosine (n,n-dibuf) mononucleoside: 139

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2'-(O-butyne) A (*N*-Bz), C (*N*-Bz), G (*N*-iBu), & U: 111

C

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CAP 2 (17% N-Methylimidazole/THF): 20
 CAP A (Acetic Anhydride/Pyridine/THF): 18, 19, 22, 25
 CAP A (Acetic Anhydride/THF): 21
 CAP A (Acetic Anhydride/THF/2,6-Lutidine): 20, 23, 24
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 CAP B (10% N-Methylimidazole/THF): 17, 18, 21-25
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 CAP B (10% N-Methylimidazole/THF/Pyridine): 21
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6-Chloro-7-Deaza Purine: 148

6-Chloro Guanine: 148

6-Chloro Inosine: 124

6-Chloro Purine: 148

o-Chlorophenyl phosphorodichloridate: 147

Cholesterol Amidites & CPG: 88

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Cordycepin (3'-deoxy Adenosine (*N*-Bz)) Amidite & CPG: 31

5 & 6 FAM Phosphoramidites & Supports: 95

CEP amidites, Natural DNA with Standard Protection: 2
CEP amidites, Natural DNA with PAC Protection: 5
CEP amidites, Natural DNA with Fast deprotection: 7
CEP amidites, Natural RNA with Standard Protection: 49
CEP amidites, Natural RNA with PAC Protection: 51
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Cytidine modifications:
 alpha-deoxy Cytidine: 117
 DMT-alpha-deoxy Cytidine (*N-Bz*) amidite: 27
 2'-Amino TFA Cytidine (*N-Bz*) 3'-phosphoramidite: 65
 3'-TFAAmino deoxy Cytidine 5'-phosphoramidite: 28
 Amino Modifier 2'-(O-Methyl) Cytidine phosphoramidite: 102
 deoxy Cytidine N4-Amino Linker 3'-CPG: 81
 deoxy Cytidine N4-Amino linker amidite: 79
 2,2'-Anhydro Cytidine-HCl: 125
 araCytidine (*N-Bz*) Amidite & CPG: 29
 5-aza deoxy Cytidine: 120
 5-Bromo-deoxy Cytidine mononucleoside: 118
 5-Bromo-deoxy Cytidine (*N-Bz*) Amidite & CPG: 32, 33
 5-Bromo-ribo Cytidine mononucleoside: 124
 5-Bromo-O-TBDMS Cytidine (*N-Bz*) Amidite & CPG: 68, 69
 2'-(O-butyne) Cytidine (*N-Bz*) 3'-succinyl Icaa CPG: 111
 2'-(O-butyne) Cytidine (*N-Bz*) amidite: 111
 dideoxy Cytidine: 117
 2',3'-dideoxy Cytidine 5'-amidite: 41
 2',3'-dideoxy Cytidine n-succinyl Icaa CPG: 41
 Etheno deoxy Cytidine: 118
 Etheno deoxy Cytidine 3'-succinyl Icaa CPG: 90
 Etheno deoxy Cytidine phosphoramidite: 90
 Etheno deoxy Cytidine 5'-triphosphate disodium salt: 151
 Etheno ribo Cytidine: 125
 Etheno ribo Cytidine 2'/3'-succinyl Icaa CPG: 90
 Etheno-2'-O-TBDMS Cytidine phosphoramidite: 90
 N3-Ethyl deoxy Cytidine phosphoramidite: 35
 N4-Ethyl deoxy Cytidine Amidite & CPG: 35
 N4-Ethyl-2'-tBDSilyl Cytidine Amidite and CPG: 64
 2'-Fluoro Cytidine mononucleoside: 123
 2'-Fluoro Cytidine (*N-Ac*) amidite: 65
 2'-Fluoro Cytidine 3'-succinyl Icaa CPG: 65
 5-Iodo-deoxy Cytidine: 118
 5-Iodo-deoxy Cytidine (n,n-isobudmf) amidite: 32
 5-Iodo-deoxy Cytidine (n,n-isobudmf) 3'-succinyl Icaa CPG: 33
 5-Iodo-ribo Cytidine: 124
 5-Iodo-2'-O-TBDMS Cytidine (*N-Bz*) amidite: 68
 5-Iodo-3'-O-TBDMS Cytidine (*N-Bz*) 2'-succinyl Icaa CPG: 69
 5'-DMT-5-Iodo deoxy Cytidine (n,n-isobudmf) mononucleoside: 138
 deoxy isoCytidine (n,n-isobutyl) Amidite & CPG: 37
 IsoCytidine (n,n-dibf) tBDSilyl Amidite & CPG: 70
 Beta-L-deoxy Cytidine: 120
 Beta-L-deoxy Cytidine (*N-Ac*) 3'-succinyl Icaa CPG: 39
 Beta-L-deoxy Cytidine (*N-Ac*) amidite: 38
 Beta-L-deoxy Cytidine (*N-Bz*) 3'-succinyl Icaa CPG: 39
 Beta-L-deoxy Cytidine (*N-Bz*) amidite: 38
 Beta-L-ribo Cytidine: 126
 Beta-L-3'-O-TBDMS Cytidine (*N-Ac*) 2'-succinyl Icaa CPG: 72
 Beta-L-2'-O-TBDMS Cytidine (*N-Ac*) 3'-amidite: 71
 Beta-L-3'-O-TBDMS Cytidine (*N-Bz*) 2'-succinyl Icaa CPG: 72
 Beta-L-2'-O-TBDMS Cytidine (*N-Bz*) 3'-amidite: 71
 5'-OH 3'-Levulinyl deoxy Cytidine (*N-Bz*): 133

5'-Levulinyl-deoxy Cytidine (*N-Bz*): 133
 5'-Levulinyl deoxy Cytidine (*N-Bz*) amidite: 14
 5-Methyl-deoxy Cytidine mononucleoside: 119
 5-Methyl-deoxy Cytidine (*N-Bz*) Amidite & CPG: 26
 5-Methyl-deoxy Cytidine (*N,N-Dmf*) Amidite & CPG: 26
 5-Methyl-ribo Cytidine mononucleoside: 123
 5-Methyl-ribo Cytidine (*N-Bz*) mononucleoside: 132
 5-Methyl-2'-(O-Methyl) Cytidine mononucleoside: 127
 5-Methyl-3'-(O-Methyl) Cytidine mononucleoside: 128
 5-Methyl-2'-(O-Methyl) Cytidine (*N,N-Dmf*) Amidite & CPG: 101, 102
 5-Methyl-2'-O-TBDMS Cytidine (*N-Bz*) amidite: 62
 5-Methyl-3'-O-TBDMS Cytidine (*N-Bz*) 2'-succinyl Icaa CPG: 62
 3'-DMT-5-Methyl-2'-(O-Methyl) Cytidine 5'-Amidite & CPG: 114, 115
 5'-DMT-5-Methyl Cytidine (*N-Bz*) mononucleoside: 137
 5'-DMT-S-Methyl ribo Cytidine (*N-Bz*) mononucleoside: 139
 N3-Methyl deoxy Cytidine mononucleoside: 119
 N3-Methyl deoxy Cytidine amidite: 34
 N3-Methyl ribo Cytidine mononucleoside: 125
 5-Propynyl-deoxy Cytidine mononucleoside: 119
 5-Propynyl-ribo Cytidine mononucleoside: 125
 5-Propynyl-2'-O-Methyl Cytidine mononucleoside: 128
 5-Propynyl-2'-(O-Methyl) Cytidine (*N-Bz*) amidite: 102
 5'-DMT 5-Propynyl deoxy Cytidine (*N-Bz*) mononucleoside: 137
 5'-DMT 5-Propynyl ribo Cytidine (*N-Bz*) mononucleoside: 139
 5'-DMT 5-Propynyl-2'-(O-Methyl) Cytidine (*N-Bz*) mononucleosid 140
 N4 6-TAMRA Cytidine Amidite & CPG: 96
 2'-O-Trifluoroacetamido propyl Cytidine (*N-Bz*) amidite: 28
2'-(O-Methyl) Cytidine 5'-triphosphate disodium salt: 150
Etheno deoxy Cytidine 5'-triphosphate disodium salt: 151
deoxy Cytidine monohydrochloride: 116
Common deoxy Cytidine mononucleosides:
 deoxy Cytidine (*N-Ac*) mononucleoside: 131
 deoxy Cytidine (*N-Bz*) mononucleoside: 131
 deoxy Cytidine (*N-iBu*) mononucleoside: 131
 deoxy Cytidine (*N-PAC*) mononucleoside: 131
 5'-DMT deoxy Cytidine (*N-Ac*) mononucleoside: 135
 5'-DMT deoxy Cytidine (*N-Bz*) mononucleoside: 135
 5'-DMT deoxy Cytidine (*N-iBu*) mononucleoside: 135
 5'-DMT deoxy Cytidine (*N-PAC*) mononucleoside: 135
 3'-(O-acetyl) Cytidine (*N-Bz*): 134
Common ribo Cytidine mononucleosides:
 ribo Cytidine: 123
 ribo Cytidine (*N-Ac*) mononucleoside: 132
 ribo Cytidine (*N-Bz*) mononucleoside: 132
 ribo Cytidine (*N-iBu*) mononucleoside: 132
 ribo Cytidine (*N-PAC*) mononucleoside: 132
 5'-DMT ribo Cytidine (*N-Ac*) mononucleoside: 136
 5'-DMT ribo Cytidine (*N-Bz*) mononucleoside: 136
 5'-DMT ribo Cytidine (*N-iBu*) mononucleoside: 136
 5'-DMT ribo Cytidine (*N-PAC*) mononucleoside: 136
 5'-DMT 2'-(O-Methyl) Cytidine (*N-Ac*) mononucleoside: 140
 5'-DMT 2'-(O-Methyl) Cytidine (*N-Bz*) mononucleoside: 140
 5'-DMT 2'-(O-Methyl) Cytidine (*N-PAC*) mononucleoside: 140
 5'-DMT-2'-O-TBDMS Cytidine (*N-Ac*) mononucleoside: 141
 5'-DMT-2'-O-TBDMS Cytidine (*N-Bz*) mononucleoside: 141
 5'-DMT-2'-O-TBDMS Cytidine (*N-PAC*) mononucleoside: 141
 5'-DMT-3'-O-TBDMS Cytidine (*N-Bz*) mononucleoside: 142
 2'-(O-allyl) Cytidine: 129
 2'-(O-Methyl) Cytidine mononucleoside: 127
 2'-(O-Propargyl) Cytidine mononucleoside: 130
 3'-(O-allyl) Cytidine: 129
 3'-(O-Methyl) Cytidine mononucleoside: 128
 3'-(O-Propargyl) Cytidine mononucleoside: 130

Common deoxy Cytidine for Oligo Synthesis:

deoxy Cytidine (*N*-Ac) 3'-succinyl polystyrene: 11
 deoxy Cytidine (*N*-Bz) 3'-succinyl Polystyrene: 11
 deoxy Cytidine (*N*-Bz) 3'-non-cleavable long chain spacer: 12
 deoxy Cytidine (*N*-PAC) 3'-oxalyl Icaa CPG: 107
 deoxy Cytidine (*N*-Ac) 3'-succinyl Icaa CPG: 4
 deoxy Cytidine (*N*-Bz) 3'-succinyl Icaa CPG: 4
 deoxy Cytidine (*N*-PAC) 3'-succinyl Icaa CPG: 6
 deoxy Cytidine (*N*-iBu) 3'-succinyl Icaa CPG: 4
 deoxy Cytidine (*N*-Bz) *P*-O-benzyl phosphoramidite: 9
 deoxy Cytidine (*N*-Ac) amidite: 2,7
 deoxy Cytidine (*N*-Bz) amidite: 2
 deoxy Cytidine (*N*-iBu) amidite: 2
 deoxy Cytidine (*N*-PAC) amidite: 5
 deoxy Cytidine (*N*-Bz) p-ethoxy phosphoramidite: 106
 deoxy Cytidine (*N*-PAC) p-ethoxy phosphoramidite: 106
 deoxy Cytidine (*N*-Bz) H-phosphonate TEA Salt: 15
 deoxy Cytidine (*N*-Bz) p-isopropoxy phosphoramidite: 110
 deoxy Cytidine (*N*-Bz) p-methoxy phosphoramidite: 8
 deoxy Cytidine (*N*-PAC) p-methoxy phosphoramidite: 110
 deoxy Cytidine (*N*-iBu) p-methyl phosphonamidite: 112
 3'-DMT deoxy Cytidine (*N*-Bz) 5'-Amidite & CPG: 10

D

Dabcyl phosphoramidite & support: 81

7-Deaza Adenosine:

7-Deaza-7-Iodo deoxy Adenosine mononucleoside: 122
 7-Deaza-7-Iodo deoxy Adenosine (*N,N*-Dmf) amidite: 31
 7-Deaza-7-Iodo 2'-(O-Methyl) Adenosine (*N*-Bz) amidite: 103
 7-Deaza-7-propargyl 2'-(O-Methyl) Adenosine (*N*-Bz) amidite: 103
 7-Deaza deoxy Adenosine mononucleoside: 122
 7-Deaza deoxyAdenosine (*N*-Bz) amidite: 30
 7-Deaza deoxyAdenosine (*N,N*-Dmf) 7-propargyl amidite: 31
 7-Deaza deoxyAdenosine (*N*-Bz) 3'-succinyl Icaa CPG: 30
 7-Deaza deoxy Adenosine 5'-triphosphate disodium salt: 151
 7-Deaza 2',3'-dideoxyAdenosine: 122
 7-Deaza ribo Adenosine mononucleoside: 126
 7-Deaza-2'-O-TBDMS Adenosine (*N*-Bz) amidite: 69
 7-Deaza 3'-O-TBDMS Adenosine (*N*-Bz) 2'-succinyl Icaa CPG: 69
 7-Deaza-2'-(O-Methyl) Adenosine (*N*-Bz) amidite: 103
 5'-DMT-7-Deaza deoxy Adenosine (*N*-Bz) mononucleoside: 137

7-Deaza Guanosine:

7-Deaza-7-Iodo deoxy Guanosine mononucleoside: 122
 7-Deaza-7-Iodo deoxy Guanosine (*N,N*-Dmf) amidite: 31

7-Deaza-7-Iodo 2'-(O-Methyl) Guanosine (*N*-iBu) amidite: 103
 7-Deaza-7-propargyl 2'-(O-Methyl) Guanosine (*N*-iBu) amidite: 103
 7-Deaza deoxy Guanosine mononucleoside: 122
 7-Deaza deoxy Guanosine (*N*-iBu) amidite: 30
 7-Deaza deoxy Guanosine (*N,N*-Dmf) 7-propargyl amidite: 31
 7-Deaza deoxy Guanosine (*N*-iBu) 3'-succinyl Icaa CPG: 30
 7-Deaza deoxy Guanosine 5'-triphosphate disodium salt: 151
 7-Deaza 2',3'-dideoxy Guanosine: 127
 7-Deaza-6-methoxy deoxy Guanosine: 127
 7-Deaza ribo Guanosine mononucleoside: 126
 7-Deaza-2'-(O-Methyl) Guanosine (*N*-iBu) amidite: 103
 7-Deaza-2'-O-TBDMS Guanosine (*N*-iBu) amidite: 69
 7-Deaza-3'-O-TBDMS Guanosine (*N*-iBu) 2'-succinyl Icaa CPG: 69

5'-DMT-7-Deaza deoxy Guanosine (*N*-iBu) mononucleoside: 137

7-Deaza Inosine:

7-Deaza-deoxy Inosine mononucleoside: 122
 7-Deaza deoxy Inosine amidite: 30
 7-Deaza deoxy Inosine 3'-succinyl Icaa CPG: 30
 7-Deaza ribo Inosine mononucleoside: 126
 5'-DMT-7-Deaza deoxy Inosine mononucleoside: 137
 deoxy nucleosides: 116
 deoxy nucleosides with base protection only: 131
 deoxy Guanosine (n,n-dimethylacetamidite) 8
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 4-Thio-deoxy Uridine mononucleoside: 120
 4-Thio deoxy Uridine Amidite & CPG: 25
 4-Thio Thymidine mononucleoside: 120
 4-Thio Thymidine Amidite & CPG: 25
 4-Thio Uridine mononucleoside: 123
 4-Thio Uridine amidite: 64
 N3-Thiobenzoylthio-O-TBDMS Uridine Amidite & CPG: 62
Thiol:
 3'-Thiol Modifier C-3 Icaa CPG: 85
 5'-Thiol C-3 Disulfide Modifier phosphoramidite: 85

5'-Thiol C-6 Disulfide Modifier phosphoramidite: 85
 5'-Thiol Modifier C-6 phosphoramidite: 85

Thiophenol/Triethylamine/Dioxane: 17-23

Thymidine modifications:

alpha-deoxy Thymidine: 117
 DMT-alpha-Thymidine Amidite: 27
 3'-Amino Thymidine phosphoramidite: 28
 5'-Amino Thymidine 3'-Amidite & CPG: 28
 Amino deoxy Thymidine (C-6) 3'-Amidite & CPG: 81
 Biotin Thymidine phosphoramidite: 86
 Thymidine C-5 DABCYL phosphoramidite: 89
 dideoxy Thymidine: 117
 2',3'-dideoxy Thymidine 5'-Amidite: 41
 Fluorescein Thymidine Amidite & CPG: 92
 Beta-L-3'-O-TBDMS Thymidine 2'-succinyl Icaa CPG: 72
 Beta-L-2'-O-TBDMS Thymidine 3'-Amidite: 71
 Beta-L-Thymidine: 120
 Beta-L-Thymidine Amidite & CPG: 38, 39
 Beta-L-ribo Thymidine: 126
 5'-OH 3'-Levulinyl deoxy Thymidine: 133
 5'-Levulinyl-deoxy Thymidine: 133
 5'-Levulinyl deoxy Thymidine amidite: 13
 N3-Methyl Thymidine mononucleoside: 119
 N3-Methyl Thymidine Amidite & CPG: 34, 35
 N3-Methyl-O-TBDMS Thymidine Amidite & CPG: 61
 5'-DMT-N3-Methyl Thymidine mononucleoside: 137
 Thymidine-succinyl Hexamide phosphoramidite (Carboxyl Generating): 88
 2-Thio Thymidine Amidite & CPG: 37
 4-Thio Thymidine mononucleoside: 120
 4-Thio Thymidine Amidite & CPG: 25
 4-Triazolyl Thymidine Amidite: 25

Common Thymidine mononucleosides:

Thymidine: 116
 ribo Thymidine: 123
 3'-(O-acetyl) Thymidine: 134
 5'-DMT Thymidine mononucleoside: 135
Common Thymidine for Oligo Synthesis:
 Thymidine 3'-succinyl Polystyrene: 11
 Thymidine 3'-non-cleavable long chain spacer: 12
 Thymidine 3'-oxalyl Icaa CPG: 107
 Thymidine 3'-succinyl Icaa CPG: 4, 6
 Thymidine *P-O-benzyl* phosphoramidite: 9
 Thymidine amidite: 2, 5, 7
 Thymidine p-ethoxy phosphoramidite: 106
 Thymidine H-phosphonate TEA Salt: 15
 Thymidine p-isopropoxy phosphoramidite: 119
 Thymidine p-methoxy phosphoramidite: 8, 119
 Thymidine p-methyl phosphoramidite: 108
 3'-DMT Thymidine 5'-Amidite & CPG: 10
 2'-(O-Methyl) p-ethoxy Thymidine phosphoramidite: 104
 2'-(O-Methyl) ribo Thymidine Amidite & CPG: 101, 102
 ribo Thymidine Silyl Amidite & CPG: 62

TMT-Chloride: 142
Drying Traps: 44
1,2,4-Triazole: 143
4-Triazolyl:

4-Triazolyl Thymidine amidite: 25
 4-Triazolyl deoxy Uridine amidite: 25
 4-Triazolyl Uridine amidite: 64
2,3,5-O-Tribenzoyl-beta-D-Ri bofu ranosyl-1-Acetate: 148
Triethyloxy-glycol phosphoramidite (Spacer 9): 84
2'-O-Trifluoroacetamido propyl Cytidine (N-Bz) amidite: 28
2'-O-Trifluoroacetamido propyl Uridine amidite: 28
Triphosphates: 150, 151
Tubercidin: 126

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Uridine modifications:

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 2,2'-Anhydro Uridine: 125
 2,2'-Anhydro-Uridine Amidite & CPG: 62
 3'-TFAmino deoxy Uridine 5'-phosphoramidite: 28
 Amino Modifier 2'-(O-Methyl) Uridine phosphoramidite: 102
 Amino Modifier (C-6) Amidite & CPG: 81
 2'-Amino TEA Uridine 3'-Amidite & CPG: 65
 5-Bromo-deoxy Uridine mononucleoside: 118
 5-Bromo-deoxy Uridine Amidite & CPG: 32, 33
 5-Bromo-O-TBDMS Uridine Amidite & CPG: 67, 68
 5-Bromo-ribo Uridine mononucleoside: 124
 5-Bromo Uridine 2'-O-Methyl Amidite & CPG: 101, 102
 5'-DMT 5-Bromo deoxy Uridine mononucleoside: 138
 2',3'-Diacetyl Uridine 5'-amidite: 70
 2',3'-Diacetyl Uridine: 134
 dideoxy Uridine: 117
 di hydro Uridine 70
 5-formyl (diacetyl)-2'-deoxyuridine 39
 2'-Fluoro Uridine mononucleoside: 123
 2'-Fluoro Uridine 3'-succinyl Icaa CPG: 65
 2'-Fluoro Uridine amidite: 65
 5-Fluoro-deoxy Uridine 3'-Amidite & CPG: 32, 33
 5-Fluoro-O-TBDMS Uridine Amidite & CPG: 68
 5-Iodo Uridine 2'-(O-Methyl) 3'-succinyl Icaa CPG: 67
 5-Iodo Uridine 2'-(O-Methyl) amidite: 101
 5-Iodo-2'-O-TBDMS Uridine amidite: 67
 5-Iodo-3'-O-TBDMS Uridine 2'-succinyl Icaa CPG: 68
 5-Iodo-deoxy Uridine 3'-succinyl Icaa CPG: 32
 5-Iodo-deoxy Uridine CEP phosphoramidite: 32
 5-Iodo-deoxy Uridine: 118
 5-Iodo-ribo Uridine: 124
 2'-(O-Methyl) 5-Iodo Uridine: 127
 5'-DMT-S-Iodo deoxy Uridine mononucleoside: 138
 Uridine 2',3'-isopropylidene: 134
 Beta-L-2'-O-TBDMS Uridine 3'-amidite: 71
 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
 N3-Methyl Uridine mononucleoside: 125
 N3-Methyl-deoxy Uridine mononucleoside: 119
 N3-Methyl Uridine Amidite & CPG: 61
 deoxy Uridine 5-methylacrylate amidite: 88
 5-Propynyl-deoxy Uridine mononucleoside: 119
 5-Propynyl-ribo Uridine mononucleoside: 125
 5-Propynyl-2'-O-Methyl Uridine mononucleoside: 128
 5-Propynyl-2'-(O-Methyl) Uridine amidite: 102
 5'-DMT 5-Propynyl deoxy Uridine mononucleoside: 137
 5'-DMT 5-Propynyl ribo Uridine mononucleoside: 139
 5'-DMT 5-Propynyl-2'-(O-Methyl) Uridine mononucleoside: 140
 2-Thio deoxy Uridine Amidite & CPG: 37
 4-Thio-deoxy Uridine mononucleoside: 120
 4-Thio deoxy Uridine Amidite & CPG: 25
 4-Thio Uridine mononucleoside: 123
 4-Thio Uridine amidite: 64
 N3-Thiobenzoyl-O-TBDMS Uridine Amidite & CPG: 61

4-Triazolyl deoxy Uridine Amidite: 25
 4-Triazolyl O-TBDMS Uridine Amidite: 64
 2'-O-Trifluoroacetamido propyl Uridine amidite: 28
2'-(O-Methyl) Uridine 5'-triphosphate disodium salt: 150
Common Uridine mononucleosides:
 Uridine: 123
 deoxy Uridine: 116
 2'-(O-allyl) Uridine: 129
 2'-O-Propargyl Uridine mononucleoside: 130
 2'-(O-Methyl) Uridine mononucleoside: 127
 2'-(O-Methyl)-5-Iodo Uridine mononucleoside: 127
 3'-(O-acetyl) Uridine: 134
 3'-(O-allyl) Uridine: 129
 3'-(O-Methyl) Uridine mononucleoside: 128
 3'-O-Propargyl Uridine mononucleoside: 130
 5'-DMT ribo Uridine mononucleoside: 136
 5'-DMT-2'-(O-Methyl) Uridine mononucleoside: 140
 5'-DMT-2'-O-TBDMS Uridine mononucleoside: 141
 5'-DMT-3'-O-TBDMS Uridine mononucleoside: 142
Common Uridine for Oligo Synthesis:
 deoxy Uridine phosphoramidite & CPG: 26
 deoxy Uridine p-methyl phosphoramidite: 112
 Uridine 3'-O-TBDMS 2'-oxalyl Icaa CPG: 52
 2'-(O-butyne) Uridine 3'-succinyl Icaa CPG: 111
 2'-(O-butyne) Uridine amidite: 111
 2'-(O-Methyl) Uridine p-methyl phosphoramidite: 109
 2'-(O-Methyl) p-ethoxy Uridine phosphoramidite: 104
 3'-(O-Methyl) Uridine phosphoramidite & support: 105
 2'-O-Propargyl Uridine phosphoramidite & support: 112
 3'-O-Propargyl Uridine phosphoramidite & support: 113
 2'-O-TBDMS Uridine amidite: 49, 51
 2'-O-TBDMS Uridine p-methoxy phosphoramidite: 54
 3'-O-TBDMS Uridine amidite (Reverse Amidite): 60
 3'-O-TBDMS Uridine 2'-succinyl Icaa CPG: 50, 51
 3'-O-TBDMS Uridine 2'-succinyl Polystyrene: 53
 3'-DMT-2'-(O-Methyl) Uridine 5'-phosphoramidite & support: 114, 115

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Vials for Beckman Synthesizers: 19



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