Nucleosides, Nucleotides, Nucleic Acids and Related Reagents

Nucleosides and Their Analogs
Nucleotides and Their Analogs
Nucleic Acids
Enzymes and Coenzymes related to Nucleic Acids
Nucleobases and Their Analogs
Pharmacologically-Active Nucleosides and Nucleobases
Nucleic Acid Synthesis Agents
Genetic information is stored in DNA as combinatorial codes held in nucleosides and nucleotides, in which form it is passed from parents to their offspring. Analogs of nucleosides and nucleotides are used clinically as medicinal agents such as reverse transcriptase inhibitors. Therefore, the preparation and development of these species as effective, selective and nontoxic antiviral and antitumor agents has been the subject of intense research.\(^1\)

In addition to this, the development of Polymerase Chain Reaction (PCR) methodology has brought a dramatic change and rapid development in studies of DNA. At the current time the draft version in decoding and mapping human genome has been almost completed, and the functional analyses of genome and analyses of “Single Nucleotide Polymorphism” (SNP) are being vigorously pursued. Discovery of the RNAi process has facilitated the fast progression of studies of RNA. At the same time, chemically synthesized oligoDNA and oligoRNA have been studied as potential antisense DNAs, siRNAs and DNA aptamers, as oligonucleotide therapeutic agents, primers for PCR method, and elements of DNA computers.

Nucleosides and Their Analogs

Nucleosides are glycosylamines made by attaching a nucleobase to a ribose or 2’-deoxyribose, which can be phosphorylated producing nucleotides. Nucleoside analogs are an established class of clinically useful medicinal agents possessing a wide range of antiviral and anticancer activities. Consequently, extensive modifications have been made to both the heterocyclic base and the sugar moiety. Some representative examples of these are 9-[(2-hydroxyethoxy)methyl]guanine (acyclovir) developed by Elion in 1977, which shows antiviral activity; 3’-azido-3’-deoxythymidine (AZT) discovered by Mitsuya et al. in 1985 and used for the treatment of HIV infection; and cytosine β-D-arabinofuranoside (cytarabine) approved by the FDA in 1969 and which has been shown to display a range anticancer activities. In addition, modified nucleosides such as 2’-deoxy-5-methylcytidine are ubiquitous in living systems, and their functions have received due attention from the scientific community.\(^2\)

Protected nucleosides, in which reactive amino and hydroxyl groups have been masked, e.g. N\(^6\)-benzoyl-5’-O-(4,4’-dimethoxytrityl)-2’-deoxyadenosine (Bz-DMT-dA), have been used for chemical synthesis of DNA and RNA.

**Nucleosides and Their Analogs**

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Please inquire for pricing and availability of listed products to our local sales representatives.
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Nucleosides, Nucleotides, Nucleic Acids and Related Reagents

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CAS RN: 69304-43-4

**L0217** 100mg 1g  
Lamivudine  
CAS RN: 134678-17-4

**C0525** 100mg 1g  
Cytidine Sulfate  
CAS RN: 32747-18-5

**B3087** 1g 5g  
N°-Benzoyl-5‘-O-(4‘,4‘-dimethoxytrityl)-2‘-deoxyctydine  
CAS RN: 67219-55-0

**F0842** 500mg 5g  
Famciclovir  
CAS RN: 104227-87-4

**H1290** 5g 25g  
9-(2-Hydroxyethyl)adenine  
CAS RN: 707-99-3

**A1915** 1g 5g 25g  
Adefovir Dipivoxil  
CAS RN: 142340-99-6

**D4256** 1g 5g  
Diethyl [2-(6-Amino-9-purin-9-yl)ethoxy]methylphosphonate  
CAS RN: 116384-53-3

**A2414** 100mg 1g  
Acyclovir  
CAS RN: 59277-89-3

**B3087** 1g 5g  
Penciclovir  
CAS RN: 82410-32-0

**E0899** 50mg 200mg  
Entecavir Monohydrate  
CAS RN: 209216-23-9

**P2164** 200mg 1g  
Valacyclovir Hydrochloride  
CAS RN: 209216-23-9

**D4137** 5g  
2‘-Deoxyadenosine Anhydrous  
CAS RN: 958-09-8

**D3584** 1g 5g  
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CAS RN: 890-38-0

**D0046** 5g 25g  
2‘-Deoxyadenosine Monohydrate  
CAS RN: 163773-93-6

**N1144** 100mg  
Nelarabine  
CAS RN: 121032-29-9

**C2206** 1g 5g  
6-Chloropurine Riboside  
CAS RN: 5399-87-1

**I0037** 25g 500g  
Inosine  
CAS RN: 58-63-9

**C3460** 100mg 1g  
N°-Dibenzoyladenosine  
CAS RN: 98463-04-0

**F0656** 200mg 1g  
2-Fluoroadenosine  
CAS RN: 146-78-1

**A2054** 1g 5g  
2-Amino-8-chloropurine Riboside  
CAS RN: 2004-07-1

**C2192** 100mg 1g  
2-Chloroadenosine  
CAS RN: 146-77-0

**A2135** 5g 25g  
2-Aminoadenosine  
CAS RN: 2096-10-8

**G0171** 5g 25g 100g  
Guanosine  
CAS RN: 118-00-3

**B3087** 1g 5g  
2°-O-Methylguanosine  
CAS RN: 2140-71-8

**M2318** 200mg 1g  
2°-O-Methyladenosine  
CAS RN: 2140-79-6

**T2691** 1g 5g  
2°-O-Methyladenosine  
CAS RN: 2140-79-6

**T2692** 1g 5g  
2°-O-Methyladenosine  
CAS RN: 2140-79-6

**G0315** 5g 25g  
Triacetlyganciclovir  
CAS RN: 86357-14-4

**D0052** 1g 5g 25g  
2‘-Deoxyguanosine Hydrate  
CAS RN: 961-07-9

**C2206** 1g 5g  
6-Chloropurine Riboside  
CAS RN: 5399-87-1

**A0152** 1g 5g 25g 100g  
Adenosine  
CAS RN: 58-61-7

**M2291** 1g  
2°-O-Methyladenosine  
CAS RN: 2140-79-6

**B3087** 1g 5g  
9-(2-Hydroxypropyl)adenine  
CAS RN: 958-09-8

**D3584** 1g 5g  
5,6-Dichlorobenzimidazole  
1-β-D-Ribofuranoside  
CAS RN: 53-85-0

**C4999** 50mg  
Cladribine  
CAS RN: 4291-63-8

**D3065** 100mg 1g  
Ganciclovir  
CAS RN: 82410-32-0

**D3066** 100mg 500mg  
Didanosine  
CAS RN: 69655-05-6

**D4292** 100mg 1g  
2°,3°-Dideoxynosine  
CAS RN: 4097-22-7

**C2206** 1g 5g  
6-Chloropurine Riboside  
CAS RN: 5399-87-1

**F0656** 200mg 1g  
2-Fluoroadenosine  
CAS RN: 146-78-1

**A0152** 1g 5g 25g 100g  
Adenosine  
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Adenosine  
CAS RN: 58-61-7

**A0152** 1g 5g 25g 100g  
Adenosine  
CAS RN: 58-61-7

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Nucleotides and Their Analogs

Nucleotides are formed from the condensation of nucleoside and a phosphate group. The nucleosides themselves are formed from a nucleobase (see below) and a sugar moiety which is either ribose (RNA) or 2'-deoxyribose (DNA). Nucleotides are the minimum structural units of DNA and RNA, and serve as important cofactors in metabolism.
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Nucleosides, Nucleotides, Nucleic Acids and Related Reagents

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Pharmacologically-Active Nucleosides and Nucleobases for Research and Experimental Use

Typical nucleosides and nucleobases used in pharmacology research are shown below, and serve as important cofactors in metabolism.

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Nucleic Acid Synthesis Agents

Silylation converts insoluble nucleobases into lipophilic trimethylsilylated derivatives, which are readily soluble in organic solvents, permitting homogenous chemical reactions. The trimethylsilylated nucleobases react with protected sugars to afford nucleosides. The procedure is commonly referred to as the Hilbert-Johnson reaction modified by Vorbrüggen et al.

Phosphorylating and phosphorothioating agents, condensing agents and protecting agents for hydroxy and amino groups are of importance in the synthesis of DNA and RNA chains. Active research on chemical synthesis of DNA and RNA is being conducted, and a variety of synthetic methods using these agents are being developed.

The dicyclohexylcarbodiimide (DCC) method exemplified by the Khorana group, the phosphiteester method and phosphiteester method by the team of Letsinger and the phosphoramidite method by the Caruthers group are examples of the various synthetic methods. Recently, the phosphoramidite method has been used frequently in tandem with the penetration of DNA synthesizers, thus 2-cyanoethyl N,N,N',N'-tetraisopropyldiphosphorodiamidite has been the reagent of frequent choice for the phosphorylation due to its ease in handling and safety. 1,2,4-Triazole and 1H-tetrazole are also used for chemical conversion of uridines into cytidines.

Chemically synthesized DNA is becoming important as a primer for the PCR method, an antisense molecule, or an element of the DNA computer.
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References


