Nucleic Acid Analysis

This section contains a compilation of special products and reagents frequently used by molecular biologists. These products have been arranged in the following categories:

- Nucleic Acid Analysis
- Nucleic Acid Isolation/Purification
- Enzymes
- PCR Reagents
- Restriction Enzymes
- DNA and Nucleic Acid Modifying Enzymes
- RNA Modifying Enzymes
- Cloning and Expression Vectors
- DNA Plasmid Vectors
- Oligonucleotides
  - DNA Linkers
  - DNA Primers
- Molecular Biology Cell Culture Components
- Molecular Biology Kits
  - DNA Purification
  - DNA Labeling
  - Chemiluminesent
  - Bioluminesent
- Additional Reagents

NUCLEIC ACID ANALYSIS

CATALOG NUMBER

150254 RT **ACRIDINE ORANGE BASE** — 5 g, 25 g, 100 g
[494-38-2]
(3,6-bis(Dimethylamino)acridine)
C.I. 46005
Fluorescent stain for proteins.
RNA Polymerase inhibitor
Dye content approx. 78%
Nature, **187**, 964 (1960).
$C_{17}H_{19}N_3$ MW 265.4

193982 RT **ACRYLAMIDE** — 25 g, 100 g, 500 g, 1 kg
[79-06-1]
Molecular Biology Reagent
Purity: >99%
No detectable DNase, RNase, or protease.
$E^{1\%}_{1cm}$ (290 nm): <0.10
Acrylic acid content: <0.001%
C_3H_5NO MW 71.08

ACRYLAMIDE/BIS PREMIX
Premix Ratio: 19:1
For convenience and safety, ICN is pleased to offer premixed acrylamide and methylene-bis-acrylamide.
Avoid handling of toxic powders, tedious weighings, and concern over spillage and waste. Each bottle contains our *Ultra Pure* Acrylamide and *Ultra Pure* N,N′-Methylene-bis-acrylamide in a choice of two sizes and three different ratios.
Just add the appropriate volume of deionized water to form a stock solution stable for up to one month at 4°C. For the 30 gm size, addition of 73.5 ml of deionized water will prepare 100 ml of stock solution. For the 200 gm size, addition of 490 ml deionized water will prepare approx. 665 ml of stock solution.

800655 — 30 g
800656 — 200 g

ACRYLAMIDE/BIS PREMIX
Premix Ratio: 29:1

800657 — 30 g
800658 — 200 g

ACRYLAMIDE/BIS PREMIX
Premix Ratio: 37.5:1

800659 — 30 g
800660 — 200 g

193983 RT **AGAROSE** — 10 g, 25 g, 50 g, 100 g, 250 g, 500 g
[9012-36-6]
Molecular Biology Reagent
Ideal for nucleic acid electrophoresis, analysis and purification.
EEO: 0.09-0.13
Moisture: <10%
No detectable DNase, RNase, or protease.

193984 **AGAROSE** — 25 g, 100 g
[9012-36-6]
High Resolution
Molecular Biology Reagent
EEO: ≤0.12
Gel Temperature (1%): <30°C
A 1% solution remains fluid at 37°C for up to 24 hours. Will set to a firm gel at <25°C, and not remelt until temperatures exceed 65°C. This ability to remain in solution at 30-37°C allows a second digest on a restriction enzyme fragment without need to recover it from the gel. Separates small DNA fragments (200-800 bp) with a resolution comparable to acrylamide.

193985 **AGAROSE** — 25 g, 100 g, 250 g
[9012-36-6]
Pulsed Field Electrophoresis
Molecular Biology Reagent
Ideal for high molecular weight DNA separation.
EEO: 0.1±0.02; Gel Temperature (1.5%): 36°C
Also, suitable for RID, counterelectrophoresis, double diffusion and other immunological procedures.

193986 **AGAROSE** — 500 mg, 1 g
[9012-36-6]
Pulsed Field Electrophoresis Sample Preparation
Molecular Biology Reagent
Gel Temperature (1%): <30°C
Excellent for making gel plugs for high molecular weight DNA separation. When embedded in plugs constructed from this agarose, cells are easily lysed and the resulting DNA released may be digested with restriction enzymes.

CATALOG NUMBER

193987 RT **AGAROSE** — 5 g, 10 g, 25 g, 100 g, 500 g
[9012-36-6]
Molecular Biology Reagent
EEO: <0.15
Gel Temperature: ≤35°C
This is a general use agarose capable of separating DNA from 50 to 1,000 base pairs on a 3% gel.

801676 **AGAROSE GEL FILM (AMP)** — 12/box
Pre-cast, ready-to-use thin film agarose gel in 2-amino-2-methyl-propanol buffer, pH 8.6. 0.4 mm thin agarose gels, 11.4 cm x 12.7 cm size. Ideal for rapid, reproducible electrophoresis work.

801677 **AGAROSE GEL FILM (BSE)** — 12/box
Pre-cast, ready-to-use thin film agarose gel in Barbital-Sucrose-EDTA buffer, pH 8.6. 0.4 mm thin agarose gels, 11.4 cm x 12.7 cm size. Ideal for rapid, reproducible electrophoresis work.

801675 **AGAROSE GEL FILM (TBE)** — 12/box
Pre-cast, ready-to-use thin film agarose gel in Tris-Borate-EDTA buffer, pH 8.8. 0.4 mm thin agarose gels, 11.4 cm x 12.7 cm size. Ideal for rapid, reproducible electrophoresis work.

193988 RT **AMMONIUM PERSULFATE** — 25 g, 100 g, 500 g
[7727-54-0]
Molecular Biology Reagent
Purity: >98%
Polymerization catalyst used with TEMED for polyacrylamide gel formation.
$(NH_4)_2S_2O_8$ MW 228.2

821559 0-5°C **AURORA™ SOUTHERN BLOT KIT** — 10 blot
For Chemiluminescent Nucleic Acid Detection
Capacity: 10-20 blots or 50-100 blots
(10x10 cm membrane)
The Aurora™ Southern Blot Kit is a highly sensitive and versatile NON-isotopic chemiluminescence-based system for the detection of biotinylated nucleic acids in Southern and Northern blotting. This system offers convenience and speed over isotopic methods by utilizing the StarLight™ high performance chemiluminescent substrate and ActiBind™-AP streptavidin-alkaline phosphatase conjugate for maximum signal intensity and low background results. As little as 1 pg of hybridized DNA and even sub-picogram quantities of biotinylated DNA bound to the membrane have been detected. Exposures require less than 60 minutes on either standard X-ray or instant film. The chemiluminescence emission will last for several days permitting multiple exposures and easy stripping and reprobing.

Kit Contents:

- StarLight™ substrate
- ActiBind™-AP
- Aurora™ Blocking reagent
- Diethanolamine

A complete protocol booklet is supplied with each kit.
See also Biotrans Nylon and PVDF Transfer Membranes.

CATALOG NUMBER

821560 0-5°C **AURORA™ SOUTHERN BLOT KIT** — 50 blot
For Chemiluminescent Nucleic Acid Detection
Capacity: 10-20 blots or 50-100 blots
(10x10 cm membrane)
The Aurora™ Southern Blot Kit is a highly sensitive and versatile NON-isotopic chemiluminescence-based system for the detection of biotinylated nucleic acids in Southern and Northern blotting. This system offers convenience and speed over isotopicemethods by utilizing the StarLight™ high performance chemiluminescent substrate and ActiBind™-AP streptavidin-alkaline phosphatase conjugate for maximum signal intensity and low background results. As little as 1 pg of hybridized DNA and even sub-picogram quantities of biotinylated DNA bound to the membrane have been detected. Exposures require less than 60 minutes on either standard X-ray or instant film. The chemiluminescence emission will last for several days permitting multiple exposures and easy stripping and reprobing.

Kit Contents:

- StarLight™ substrate
- ActiBind™-AP
- Aurora™ Blocking reagent
- Diethanolamine

A complete protocol booklet is supplied with each kit.
See also Biotrans Nylon and PVDF Transfer Membranes.

194771 0-5°C **ALBUMIN, BOVINE** — 5 g, 10 g, 50 g, 100 g, 500 g
[9048-46-8]
From Bovine Plasma
Cell Culture Reagent
Purity: 96-99%
Prepared fresh by the Cohn cold ethanol fractionation method followed by crystallization at low temperature from an alcohol containing solution. The material is not heated at any stage in the process. It can be utilized as a nutrient for tissue culture, for preparation of protein standards, and as an antigen in immunological studies in sensitive research applications.
pH 1% solution: 5.2 ±0.2
Sulfated Ash: <0.5%
Carbohydrates: <0.1%
Moisture: <5.2%

193989 0°C **5-BROMO-4-CHLORO-3-INDOLYL PHOSPHATE** — 25 mg, 100 mg, 500 mg
[102185-33-1]
Molecular Biology Reagent
Disodium Salt
Purity: >98%
Chromogenic substrate for alkaline phosphatase in ELISA.
$C_8H_4BrClNO_4PNa_2$ MW 370.4

193991 RT **5-BROMO-4-CHLORO-3-INDOLYL PHOSPHATE** — 25 mg, 100 mg, 500 mg
[6578-06-9]
Molecular Biology Reagent
p-Toluidine Salt
Purity: ≥98%
A chromogenic substrate for alkaline phosphatase in ELISA.
$C_8H_6BrClNO_4P \bullet C_7H_9N$ MW 433.6

193990 RT **BROMOPHENOL BLUE** — 5 g, 10 g, 25 g
[62625-28-9]
Molecular Biology Reagent
Sodium Salt
Ideal tracking dye for nucleic acid gel electrophoresis.
$C_{19}H_9Br_4O_5SNa$ MW 692.0

CATALOG NUMBER

193992 RT **DEXTRAN SULFATE** — 5 g, 10 g, 50 g, 100 g, 500 g
[9011-18-1]
Molecular Biology Reagent
Sodium Salt
Avg Mol. Weight: 500,000
Ideal for nucleic acid hybridizations.

157574 0°C **4′,6-DIAMIDINO-2-PHENYLINDOLE** — 1 mg, 5 mg, 10 mg, 25 mg
[28718-90-3]
(DAPI)
Dihydrochloride
Crystalline
$C_{16}H_{15}N_5 \bullet 2HCl$ MW 350.2

193993 RT **ETHIDIUM BROMIDE** — 250 mg, 1 g, 5 g, 25 g
[1239-45-8]
(2,7-Diamino-10-ethyl-9-phenylphenanthridinium bromide; Homidium bromide)
Molecular Biology Reagent
Purity: 98%
Ideal for fluorometric detection of double stranded nucleic acids in gel electrophoresis. Also acts as an RNA polymerase inhibitor, and in separation of high molecular weight DNA's.
$C_{21}H_{20}N_3Br$ MW 394.3

802511 RT **ETHIDIUM BROMIDE SOLUTION** — 10 ml
[1239-45-8]
A 10mg/ml easy-to-use solution of ethidium bromide in specially filtered, deionized water.
- Excellent for nucleic acid electrophoresis and purification applications.
- Eliminates the dust hazard associated with powdered ethidium bromide
- Saves time spent on weighing and mixing.

$C_{21}H_{20}BrN_3$ MW 394.3

ETHIDIUM BROMIDE TABLETS
[1239-45-8]
(2,7-Diamino-10-ethyl-9-phenylphenanthridinium bromide)
Syn: Homidium bromide
Ethidium Bromide tablets from ICN are the safest and most convenient way to prepare DNA staining solutions when using genetic molecular biochemistry procedures. The tablet form of Ethidium Bromide makes it safer and easier to dispense chemicals and enhances accuracy of results without exposure to Ethidium Bromide powder.
Ethidium Bromide tablets are useful for all applications requiring nucleic acid staining, including CsCl plasmid DNA isolation and gel electrophoresis. ICN's Ethidium Bromide confers a deep red stain to DNA by acting as an intercalating agent between the starch bases. Subsequent fluorescence techniques enable the extraction and characterization of DNA bands.

Key Benefits:

- Minimizes risk of dust inhalation
- Simplifies dispensing
- Extremely convenient & accurate
- Fast dissolving

100 mg per tablet

806808 10 tab.
806810 25 tab.
806812 50 tab.
806814 100 tab.

CATALOG NUMBER

194047 RT **FORMALDEHYDE, ACS** — 100 ml, 500 ml
[50-00-0]
Formalin
ACS Reagent Grade
37% Solution
Purity: 36.5-38%
Contains 10-15% methanol.
CH_2O MW 30.03

193995 RT **FORMAMIDE** — 100 g, 250 g, 500 g, 1 kg
[75-12-7]
Molecular Biology Reagent
Purity: ≥99.5%
Ideal for sequencing, denaturing polyacrylamide gels, and nucleic acid hybridization.
CH_3NO MW 45.0

193996 RT **GLYCEROL** — 100 ml, 500 ml, 1 liter
[56-81-5]
Molecular Biology Reagent
Purity: 99+%
Heavy metals (Pb): <5 ppm
No detectable DNase, RNase, or protease.
Prevents back-diffusion and protein samples into the buffer.
$C_3H_8O_3$ MW 92.09

193997 RT **N,N′-METHYLENE-*bis*-ACRYLAMIDE** — 10 g, 25 g, 100 g, 250 g
[110-26-9]
Molecular Biology Reagent
Purity: 98+%
Ideal for precise, critical PAGE gels.
Acrylic acid content: <0.1%
$C_7H_{10}N_2O_2$ MW 154.2

193998 RT **METHYLENE BLUE** — 5 g, 25 g, 100 g
[61-73-4]
(Methylthionine chloride; C.I. 53015)
Trihydrate
Molecular Biology Reagent
An ethidium bromide alternative for the visualization of nucleic acids in gels.
- Gels are viewable in visible light
- Does not require a darkroom
- No UV induced DNA damage
- Gels can be stored for several days
- Only 30 minute destaining time for PAGE gels

Ref.: Peacock, A.C. and Dingman, C.W., Biochemistry, **6**, 1818 (1967).
$C_{16}H_{18}ClN_3S \bullet 3H_2O$ MW 373.9

193999 0-5°C **p-NITRO BLUE TETRAZOLIUM** — 50 mg, 250 mg, 1 g
[298-83-9]
(3,3′-(3,3′-Dimethoxy-4,4′-biphenylene)-bis-(2-p-nitrophenyl)-5-(phenyl)-2H-tetrazolium chloride)
Molecular Biology Reagent
Ideal for alkaline phosphatase conjugate detection in nucleic acid probe detection systems.
$C_{40}H_{30}Cl_2N_{10}O_6$ MW 817.6

194014 RT **ORANGE G** — 25 g, 100 g
[1936-15-8]
(Acid Orange 10; 7-Hydroxy-8-phenylazo-1,3-naphthalenedisulfonic acid; C.I. 16230)
Molecular Biology Reagent
Sodium Salt
A tracking dye in nucleic acid gel electrophoresis which runs significantly faster than bromophenol blue.
$C_{16}H_{10}N_2O_7S_2Na_2$ MW 452.4

CATALOG NUMBER

194015 0-5°C **PAGE SOLUTION FOR DNA SEQUENCING** — 100 ml, 5x100 ml
6% PAGE Solution
Acrylamide/bis-Acrylamide (19:1) solution in TBE with 7M urea. Simply add TEMED and fresh ammonium persulfate and you are ready to pour a sequencing gel. No DNase, RNase, or protease detected.

194016 0-5°C **PAGE SOLUTION FOR DNA SEQUENCING** — 100 ml, 5x100 ml
8% PAGE Solution
Acrylamide/bis-Acrylamide (19:1) solution in TBE with 7M urea. Simply add TEMED and fresh ammonium persulfate and you are ready to pour a sequencing gel. No DNase, RNase, or protease detected.

194017 RT **POLYVINYLPYRROLIDONE** — 100 g, 500 g, 1 kg
[9003-39-8]
Molecular Biology Reagent
Average MW 360,000
Suitable for nucleic acid hybridizations. No detectable nuclease activity.

800506 **PYRONIN Y** — 5 g
[92-32-0]
Molecular Biology Reagent
A marker dye for acid buffer systems which indicates the migrating boundary during electrophoresis.
$C_{17}H_{19}N_2OCl$ MW 302.8

193994 0-5°C **STAINS-ALL** — 250 mg, 1 g, 5 g
[7423-31-6]
(1-Ethyl-2-(3-[1-ethylnaphtho(1,2-d)thiazolin-2-ylidene]-2-methyl-propenyl)naphtho(1,2-d)thiazolium bromide; 3,3′-Diethyl-9-methyl-4,5,4′,5′-dibenzothia-carbocyanine)
Molecular Biology Reagent
Purity: ~95%
Cationic carbocyanine dye used as stain in electrophoresis. Differentially stains proteins and nucleic acids.
$C_{30}H_{27}BrN_2S_2$ MW 559.6

194018 RT **SUCROSE** — 500 g, 1 kg, 5 kg
[57-50-1]
Molecular Biology Reagent
Purity: 99+%
Glucose: <.1%
Heavy metals (Pb): <5 ppm
DNase, RNase, and protease free.
$C_{12}H_{22}O_{11}$ MW 342.30

194019 RT **N,N,N′,N′-TETRAMETHYL-ETHYLENEDIAMINE** — 25 ml, 50 ml, 100 ml
[110-18-9]
(TEMED; TMEDA)
Molecular Biology Reagent
Purity: ~99%
Polyacrylamide gel formation catalyst.
1 ml = approx. 0.77 g
$C_6H_{16}N_2$ MW 116.2

152113 RT **TETRAMETHYLAMMONIUM CHLORIDE** — 100 g, 250 g, 500 g, 1 kg
[75-57-0]
Crystalline
Purity: ~98%
$C_4H_{12}NCl$ MW 109.6

CATALOG NUMBER

816202 **TRIS-BORATE-EDTA BUFFER** — 1 box
0.089M Tris
0.089M Boric acid
0.0025M EDTA
Empty contents of 1 packet into a 4-liter flask and add deionized water. Four liters of pH 8.3 TBE buffer is now ready to use. This non-SDS based buffer is commonly used for Polyacrylamide Gel Electrophoresis.
(1 box contains 12 packets)

821581 RT **TRIS-BORATE-EDTA GEL RUNNING BUFFER SYSTEM** — 1 kit
A Tris-Borate-EDTA 5X concentrated running buffer, consisting of 2 x 500 ml of Tris-Borate-EDTA 5X, and 1 x 25 ml Tris-Borate-EDTA 2X sample solubilization buffer.

821697 **TRIS-BORATE-EDTA SAMPLE SOLUBILIZATION BUFFER** — 25 ml
This is a prepared solution for dissolving samples prior to electrophoresis. Samples should be mixed in a 1:1 ratio with this sample solubilization buffer. This buffer contains Tris 0.18M, Boric Acid 0.16M, EDTA 0.0052, Sodium Azide 0.01%, Sucrose 10.0%, Bromophenol Blue 0.02%, and it is tritrated to pH 8.0 with HCl.

816204 **TRIS-EDTA BUFFER** — 1 box
10 mM Tris HCl
0.1 mM EDTA
Empty contents of 1 packet into a 4-liter flask and add deionized water. Four liters of pH 7.4 buffer is now ready for use. This buffer is useful for DNA extractions from Low Gelling Temperature (LGT) Agarose gels.
Note: If contents of 1 packet are dissolved in only 2 liters of deionized water, this buffer is then useful for DNA isolations with cesium chloride protocols.
(1 box contains 12 packets)

816200 **TRIS-GLYCINE BUFFER** — 1 box
0.025M Tris
0.192M Glycine
Empty contents of 1 packet into a 4-liter flask, add 800 ml of methanol, and quesce to volume with deionized water. Four liters of pH 8.3 buffer is now ready to use.
This buffer is routinely used for electroblotting of proteins (Western Protein Transfer). Recommended buffer for use with our Biotrans™ Membranes for Western Transfers.
(1 box contains 12 packets)

821580 RT **TRIS-GLYCINE-SDS GEL RUNNING BUFFER SYSTEM** — 1 kit
A Tris-Glycine-SDS 10X concentrated running buffer, consisting of 1 x 500 ml of 10X Tris-Glycine-SDS, 1 x 25 ml Tris-Glycine-SDS 2X sample solubilization buffer, and 1 x 25 ml Tris-Glycine-SDS 2X sample solubilization buffer with 2-mercaptoethanol.

816201 **TRIS-GLYCINE-SDS BUFFER** — 1 box
0.025M Tris
0.192M Glycine
0.1% SDS
Empty contents of 1 packet into a 4-liter flask and add deionized water. Four liters of buffer is now ready to use. This is a commonly used protein running buffer in electrophoresis.
(1 box contains 12 packets)

CATALOG NUMBER

194020 RT **XYLENE CYANOLE F.F.** — 10 g
[2650-17-1]
(C.I. 42135, Acid Blue 147)
Molecular Biology Reagent
Dye Content: ~75%
A tracking dye for DNA sequencing in agarose or polyacrylamide gels.
$C_{25}H_{27}N_2O_6S_2Na$ MW 538.6

NUCLEIC ACID ISOLATION/ PURIFICATION REAGENTS

194000 RT **AMMONIUM ACETATE** — 100 g, 250 g, 500 g
[631-61-8]
Purity: ~98%
Molecular Biology Reagent
$NH_4C_2H_3O_2$ MW 77.1

194001 RT **n-BUTANOL** — 25 ml, 100 ml, 500 ml
[71-36-3]
(1-Butanol; Butyl Alcohol)
Molecular Biology Reagent
Purity: 99+%
Useful for ethidium bromide removal from DNA purified by CsCl gradient ultracentrifugation. It may also be used in the concentrationof dilute nucleic acid solutions by repeated extractions. Improved recovery by ethanol precipitation results from increased nucleic acid concentration.
$C_4H_{10}O$ MW 74.12

150589 RT **CESIUM CHLORIDE** — 5 g, 25 g, 100 g, 500 g, 1 kg
ULTRA PURE
[7647-17-8]
Ultra Pure
Purity: 99.999%
A_{260} of 50% solution < 0.02
Solutions are clear and colorless. Especially suited for critical density gradient techniques.
CsCl MW 168.4

101321 RT **CESIUM CHLORIDE** — 25 g, 100 g, 250 g, 500 g, 1 kg
[7647-17-8]
Reagent Grade
Purity: 99.0%
Solubility: Clear, colorless (50% aqueous solution)
pH: 5.5-6.5 (1% aqueous solution)
CsCl MW 168.4

194002 RT **CHLOROFORM** — 25 ml, 100 ml, 500 ml
[67-66-3]
Molecular Biology Reagent
Purity: 99+%
For nucleic acid purification. Improves extraction of crude DNA when used with phenol.
$CHCl_3$ MW 119.4

190176 RT **CETYLDIMETHYLETHYL-AMMONIUM BROMIDE** — 25 g, 100 g, 500 g
[124-03-8]
(Hexadecyldimethylethylammonium bromide)
Approx. 85% Cetyl (C_{16}); balance: Stearyl (C_{18}) homolog
Phase transfer catalyst.
$C_{20}H_{44}BrN$ MW 378.4

CATALOG NUMBER

194003 RT **GUANIDINE THIOCYANATE** — 100 g, 250 g, 500 g
[593-84-0]
Molecular Biology Reagent
Purity: ≥99%
Strong protein denaturant which inactivates nucleases approximately 2.5 times faster than guanidine hydrochloride.
$CH_5N_3 \bullet HSCN$ MW 118.2

194005 RT **ISOAMYL ALCOHOL** — 25 ml, 100 ml, 500 ml
[123-51-3]
(Isopentyl alcohol; 3-Methyl-1-butanol)
Molecular Biology Reagent
Purity: ≥98%
Ideal for nucleic acid purification.
$C_5H_{12}O$ MW 88.15

194006 RT **ISOPROPYL ALCOHOL** — 25 ml, 100 ml, 500 ml
[67-63-0]
(Isopropanol; 2-Propanol)
Molecular Biology Reagent
Purity: 99+%
Ideal for precipitating nucleic acids. In comparison to ethanol, approximately half the amount is required for precipitation which minimizes the total volume for recovery.
C_3H_8O MW 60.1

194008 RT **N-LAUROYLSARCOSINE** — 50 g, 100 g, 250 g
[7631-98-3]
Molecular Biology Reagent
Sodium Salt
Purity: ≥97%
Useful in concentrated salt solutions used in the cell lysis step during RNA purification.
$C_{15}H_{28}NO_3Na$ MW 293.4

800800 RT **LIQUACRYL™** — 500 ml
A 40% (W/V) solution of Ultra Pure Acrylamide in specially-prepared deionized water.
How to Use:

$$\text{ml of LiquAcryl to use} = \frac{(MC)\left(\text{Final desired gel concentration}\right)\left(\text{Final ml of gel to be prepared}\right)}{(40\%)}$$

Where *MC*

$$\left(\text{Monomer Content}\right) = \frac{(\text{Parts of monomer in final gel})}{\left(\text{Parts of Monomer content}\right) + \left(\text{Parts of Cross-linker content}\right)}$$

Example: A 19:1 mixture would have a 0.95 MC (Monomer Content)

800801 RT **LIQUABIS™** — 500 ml
A 2%(W/V) solution of Ultra Pure *bis*-Acrylamide (N,N′-Methylene-*bis*-Acrylamide) solution in specially-prepared deionized water.
How to Use:

$$\text{ml of LiquaBis to use} = \frac{(CC)\left(\text{Final desired gel concentration}\right)\left(\text{Final ml of gel to be prepared}\right)}{(2\%)}$$

Where *CC*

$$\left(\text{Cross-linker Content}\right) = \frac{(\text{Parts of Cross-Linker in final gel})}{\left(\text{Parts of Cross-linker content}\right) + \left(\text{Parts of Monomer content}\right)}$$

For Example: A 19:1 mixture would have a 0.05 CC (Cross-linker Content)

CATALOG NUMBER

800802 RT **LIQUI-GEL™ 19:1** — 500 ml

A 40% (W/V) solution of Ultra Pure Acrylamide (38%) and *bis*-Acrylamide (2%) in specially deionized water.
Final ratio is 19:1
How to Use:

$$\text{ml of Liqui-Gel}_{19:1\ use} = \frac{(\text{Final desired gel concentration})(\text{Final ml of gel to be prepared})}{(40\%)}$$

800803 RT **LIQUI-GEL™ 29:1** — 500 ml

A 40% (W/V) solution of Ultra Pure Acrylamide (38.67%) and *bis*-Acrylamide (1.33%) in specially-prepared deionized water. Final ratio is 29:1.
How to Use:

$$\text{ml of Liqui-Gel}_{29:1\ use} = \frac{(\text{Final desired gel concentration})(\text{Final ml of gel to be prepared})}{(40\%)}$$

800804 RT **LIQUI-GEL™ 37.5:1** — 500 ml

A 40% (W/V) solution of Ultra Pure Acrylamide (38.96%) and *bis*-Acrylamide (1.04%) in specially-prepared deionized water. Final ratio is 37.5:1.
How to Use:

$$\text{ml of Liqui-Gel}_{37.5:1\ use} = \frac{(\text{Final desired gel concentration})(\text{Final ml of gel to be prepared})}{(40\%)}$$

LIQUI-GENE™ 4%

A premixed liquid acrylamide denaturing gel mix containing *bis*acrylamide, 1x TBE as a buffer, and 7M urea for use in polyacrylamide gel electrophoresis. It is available in three concentrations allowing for flexible applications and efficiency.

- Saves Time - Comes ready-to-use, no mixing or filtering necessary. Just de-gas, polymerize, and pour.
- Economical - Eliminates waste and the need for numerous separate reagents.
- Safer To Use - No exposure to acrylamide dust or concentrated solutions.
- Variable Concentrations - 4%, 6%, and 8% for different applications. The 4% gel strength suitable for traditional DNA and RNA isolation applications.

802522 5x100ml
802523 4x500ml

LIQUI-GENE™ 6%

This is a premixed liquid acrylamide denaturing gel mix for use in polyacrylamide gel electrophoresis prepared at a 6% gel strength. This concentration is optimal for DNA sequencing applications.

802524 5x100ml
802525 4x500ml

LIQUI-GENE™ 8%

This is a premixed liquid acrylamide denaturing gel mix for use in polyacrylamide gel electrophoresis prepared at an 8% gel strength. This concentration is suitable for traditional DNA and RNA isolation applications.

802526 5x100ml
802527 4x500ml

CATALOG NUMBER

LIQUI-PRO™ 6%

A premixed liquid denaturing acrylamide gel mix for the discontinuous polyacrylamide gel electrophoresis of proteins containing 0.375M Tris (pH 8.8), 0.1% SDS as a denaturing agent, and ultra pure acrylamide in filtered, distilled, and deionized water. Additionally, each resolving mix is supplied with 4% acrylamide stacking gel made with 0.125M Tris (pH 6.8). Available in four convenient strengths.

- Saves Time - No need to prepare separate gel mixes. It is ready-to-use.
- Economical - Eliminates numerous individual reagents and reduces risk of costly errors associated with inconsistent reagent quality and concentrations.
- Safer To Use - No exposure to acrylamide dust or concentrated solutions.
- Excellent Reproducibility - Ultra Pure reagents and strict quality control of formulation assures lot-to-lot consistency.
- Choice of Strengths - 6%, 8%, 10%, and 12% resolving gels allows for flexibility.

802528 5x100ml
802529 4x500ml

LIQUI-PRO™ 8%

This is a premixed liquid denaturing acrylamide gel mix for the discontinuous polyacrylamide gel electrophoresis of proteins prepared essentially the same as Liqui-Pro™ 6%, only this one is at an 8% strength. Additionally, it is supplied with 4% acrylamide stacking gel made with 0.125M Tris (pH 6.8).

802530 5x100ml
802531 4x500ml

LIQUI-PRO™ 10%

This is a premixed liquid denaturing acrylamide gel mix for the discontinuous polyacrylamide gel electrophoresis of proteins prepared at a 10% strength. It is also supplied with 4% acrylamide stacking gel.

802532 5x100ml
802533 4x500ml

LIQUI-PRO™ 12%

This is a premixed liquid denaturing acrylamide gel mix for the discontinuous polyacrylamide gel electrophoresis of proteins prepared at a 12% strength. It is also supplied with 4% acrylamide stacking gel.

802534 5x100ml
802535 4x500ml

158386 -20°C **OLIGO (dT) CELLULOSE** — 100 mg, 250 mg, 500 mg, 1 g

ICN's Oligo (dT) Cellulose has the advantages of specificity of binding, quantitative binding, dependability, simplicity of use and economy (can be recycled many times).
Applications:
- large scale isolation of mRNA
- poly (rA) binding
- [^{3}H] HeLa mRNA binding (*see radiochemicals section*)

Binds chains up to 18 nucleotides long
Binds minimum ≥100 A_{260}/gm

ICN's Oligo dT Cellulose has a 2 fold higher binding activity than most other products. Compare it with the material you are now using and you may be in for a pleasant surprise!

194011 **PHENOL** — 25 g, 100 g, 500 g

[108-95-2]
Molecular Biology Reagent
Purity: 99+%
Melting Point: 40.0°C
Water: <0.5%
Heavy Metals: <0.01%
Nuclease Content: None detected
Distilled in glass into argon purged containers to yield a highly purified phenol for critical nucleic acid extractions. Useful for extraction of viral, plasmid and phage DNAs, and to solubilize and dissociate proteins.
C_6H_6O MW 94.1

CATALOG NUMBER

PHENOL:CHLOROFORM SATURATED SOLUTION, pH 4.7
This is a ready-to-use saturated solution of phenol and chloroform suitable for the purification of RNA from mixtures containing DNA, RNA, and other proteins.
5:1 solution, pH 4.7

802512 — 100 ml
802513 — 400 ml

154170 -20°C **RIBONUCLEASE INHIBITOR** — 1 KU, 2 KU, 5 KU, 10 KU
From Human Placenta
Activity: 10.0 units/µl min.
Unit Definition: One unit is the amount required to inhibit 50% of the activity of 5 ng of Ribonuclease A in a cytidine 2',3'-cyclic monophosphate system at 25°C.
Supplied as a solution in 50% glycerol, 20 mM HEPES-KOH, pH 7.6, 50 mM KCl, 5 mM DTT.

156534 0°C **RIBONUCLEIC ACID, TRANSFER** — 100 U, 500 U, 1 KU, 5 KU
[9014-25-9]
(Transfer RNA; t-RNA)
Activity: ~19 A_{260} units/mg.
Acceptor activities given in picomoles (10^{-12} moles) per A_{260} unit.
Unit Definition: One unit will yield an A_{260} of 1.0 in 1.0 ml of water (1 cm light path).
From Bakers Yeast
Lyophilized powder
Typical Amino Acid Acceptor Activity (picomoles per A_{260} unit): glutamic acid: 45; phenylalanine: 55; valine: 90; alanine: 70.

821682 RT **RNase ERASE™** — 250 ml
Spray Bottle
A novel RNase decontamination solution. Completely removes RNase contamination from glass and plastic surfaces, pipettes, and equipment that must be "RNase-free."

821683 RT **RNase ERASE™** — 2x125 ml
Dropper/Squirt Bottle
A novel RNase decontamination solution. Completely removes RNase contamination from glass and plastic surfaces, pipettes, and equipment that must be "RNase-free."

195253 RT **SEPHADEX® G-25** — 10 g, 50 g, 100 g
[9041-35-4]
Super-FineFractionation Range (MW)
Globular proteins: 1000-5000
Dextrans: 100-5000
Dry Bead Diameter: 20-50 µg
Bed Volume: 4-6 ml/g

195581 RT **SEPHADEX® G-50** — 10 g, 50 g, 100 g
[9048-71-9]
FineFractionation Range (MW)
Globular proteins: 1500-30,000
Dextrans: 500-10,000
Dry Bead Diameter: 20-80 µg
Bed Volume: 9-11 ml/g

195580 RT **SEPHADEX® G-50** — 10 g, 50 g, 100 g
[9048-71-9]
MediumFractionation Range (MW)
Globular proteins: 1500-30,000
Dextrans: 500-10,000
Dry Bead Diameter: 50-150 µg
Bed Volume: 9-11 ml/g

CATALOG NUMBER

195583 RT **SEPHADEX® G-100** — 10 g, 50 g, 100 g
[9050-94-6]
Super-Fine
Fractionation Range (MW)
Globular proteins: 4000-100,000
Dextrans: 1000-100,000
Dry Bead Diameter: 20-50 µg
Bed Volume: 15-20 ml/g

194012 RT **SODIUM ACETATE** — 250 g, 1 kg, 5 kg
[127-09-3]
Molecular Biology Reagent
Anhydrous
Purity: >98%
$C_2H_3O_2Na$ MW 82.03

194013 0°C **SPERMINE** — 1 g, 5 g, 10 g
[306-67-2]
Tetrahydrochloride
Molecular Biology Reagent
Purity: >96
Ideal for DNA precipitation from low salt aqueous buffers.
$C_{10}H_{26}N_4 \bullet 4HCl$ MW 348.2

ENZYMES

194119 -20°C **AGARASE** — 25 U, 100 U
[37288-57-6]
(Agarose 3-glycanohydrolase; EC 3.2.1.81)
From *Pseudomonas atlantica*
Lyophilized powder containing BSA as a stabilizer.
Activity: ≥10 units/mg protein.
Highly purified, DNase, RNase, and phosphatase undetectable.
Unit Definition: one unit will solubilize 500 mg of molten 1% LMP agarose per hour at 40-42°C.

100575 0-5°C **DEOXYRIBONUCLEASE I** — 5 mg, 10 mg, 20 mg, 100 mg, 250 mg
[9003-98-9]
Bovine Pancreas
Activity: 2,000-2,600 Kunitz units/mg, Dry weight.
A lyophilized powder containing a small amount of glycine stabilizer.
Stable: 2-3 years

190062 0°C **DEOXYRIBONUCLEASE I** — $1x10^7$ U, $5x10^7$ U
[9003-98-9]
From Bovine pancreas
E.C.3.1.4.5
Lyophilized solid
Activity: 50,000-150,000 Dornase units/mg solid.
Unit Definition: One Dornase unit is defined as the amount of enzyme that causes the fall of 1.0 relative viscosity unit in a solution of highly polymerized DNA in ten minutes at 30°C from the initial relative viscosity of 4.0 (95,000 Dornase units equal approx. 3,000 Kunitz units.

CATALOG NUMBER

195303 0°C **LYSOZYME** — 1 g, 5 g, 25 g
[9001-63-2]
(Muramidase)
From Chicken Eggwhite
Type VI
Molecular Biology Reagent
3X Crystallized
Salt-Free, Albumin-Free
Lyophilized
Activity: ~60,000 units/mg protein
Unit Definition: one unit will produce a decrease in A_{450} of 0.001 per minute at pH 6.24 and 25°C using *Micrococcus lysodeikticus* as substrate.

150208 0°C **NEUTRALASE™, GRADE I** — 10 KU, 25 KU, 50 KU
(Neutral Protease)
From *Streptomyces griseus*
A neutral, non-specific protease.
Activity: Approx. 1,000,000 PU/gm
Unit Definition: One PU is the amount of enzyme that will liberate folin-positive amino acids and peptides equivalent to 1 µg of tyrosine within 1 minute at pH 7.5 and 40°C, using casein as a substrate.
This enzyme is most active at neutral pH. Allows isolation of double-stranded DNA in high yield without the use of phenol. Digests almost any protein to free amino acid without decomposition. Useful in cell culture work to break down tissue cell matrix without damaging individual cells (e.g. isolation of chrondrocytes).

152341 0°C **NEUTRALASE™, GRADE II** — 1 g, 5 g, 10 g, 50 g
(Neutral Protease)
From *Streptomyces griseus*
Activity: Approx. 250,000 PU/gm
Unit Definition: One PU is the amount of enzyme that will liberate folin-positive amino acids and peptides equivalent to 1 µg of tyrosine within 1 minute at pH 7.5 and 40°C, using casein as a substrate.

150209 0-5°C **PROTEASE** — 100 U, 500 U, 1 KU
[9001-92-7]
Alkaline
From *Streptomyces griseus*
Lyophilized powder
Activity: 15-20 units/mg solid
Unit Definition: One unit will hydrolyze casein to produce peptide equivalent to 1.0 µmole of tyrosine per minute at 30°C and pH 11.0.
This protease is approx. twice as active as most proteases at pH 11, compared to the typical assay conditions of pH 7.5 and 37°C.

193625 0°C **20S PROTEASOME** — 500 µg
Recombinant
Expressed in *E. coli*
A threonine protease with two distinct endopeptidase activities hydrolyzing proteins on the carboxyl side of hydrophobic and acidic amino acid residues (chymotrypsin-like and peptidylglutamyl-peptide hydrolase activities).
Activity: chymotrypsin-like activity: hydrolysis of Suc-Ala-Ala-Phe-AMC yields 1.2 nmol of 7-amino-4-methylcoumarin (AMC) per minute per mg protein.
Petidylglutamyl-peptide hydrolase activity: hydrolysis of CBZ-Leu-Leu-Glu-β-NA yields 8.9 nmol of β-naphthylamine per minute per mg protein.
Unit Definition: one unit is the amount of enzyme that hydrolyzes one nmol of peptide in one minute at 60°C.
Ref.: Maupin-Furlow, J.A. and Ferry, J.G., *J. Biol. Chem.*, **270**, 28,617-28,622 (1995).

CATALOG NUMBER

193981 0-5°C **PROTEINASE K** — 5 mg, 10 mg, 25 mg, 100 mg, 500 mg, 1 g
[39450-01-6]
From *Tritirachium album*
Molecular Biology Reagent
Chromatographically Purified
Suitable for both protein and nucleic acid isolation. Exhibits proteolytic activity on proteins, peptides, glycoproteins, amides and esters. Also active with nitroanilides of amino acids with protected amino groups, excluding arginine. Useful in the isolation of DNA and RNA, in the analysis of membrane structures and protein structure.
Activity: 10-30 units per mg protein.
Unit Definition: one unit is the amount of enzyme which liberates 1 µmol of Folin-positive amino acids per minute at pH 7.5 and 35°C, using hemoglobin as substrate.
Protein Content: >80%
RNase: < 5 x 10^{-4} U/mg
DNase: < 5 x 10^{-4} U/mg

193980 0°C **RIBONUCLEASE A** — 10 mg, 50 mg, 250 mg, 500 mg, 1 g
[9001-99-4]
From Bovine Pancreas
E.C. 2.7.7.16
Molecular Biology Reagent
Chromatographically Purified
Lyophilized powder
Salt-free and protease-free
Activity: ≥70 Kunitz units/mg
Unit Definition: one unit causes the hydrolysis of RNA at a rate such that the velocity constant (k) equals 1 at 25°C and pH 5.0

101076 0°C **RIBONUCLEASE A** — 100 mg, 250 mg, 1 g
[9001-99-4]
From Beef Pancreas
Prepared from aggregate-free RNase; Lyophilized;
Activity: 50 Kunitz units/mg.
Free of phosphate and protease; any aggregates can be converted to monomers:
Ref.: J. Biol. Chem., **240**, 3868 (1965).

PCR REAGENTS

194799 RT **ACETAMIDE** — 10 g, 50 g
[60-35-5]
(Acetic Acid Amide)
Molecular Biology Reagent
A 5% (w/v) aqueous acetamide added to PCR mixtures reduces non-specific annealing of primers and prevents amplification of replication artifacts.
Ref.: Reyesenbach, A.L., Appl. Environ. Microbiol., **58**, 3417 (1992).
C_2H_5NO MW 59.07

194800 RT **CHLOROFORM** — 1 vial, 5 vials
[67-66-3]
Molecular Biology Reagent
Purity: 99+%
Used for PCR aqueous phase recovery overlaid with mineral oil.
Each vial contains 1.5 ml.
$CHCl_3$ MW 119.4

CATALOG NUMBER

191421 RT **MAGNESIUM CHLORIDE, ACS** — 100 g, 500 g, 1 kg, 5 kg
[7791-18-6]
ACS Reagent Grade
Purity: 99.0-101.0%
Hexahydrate
Crystalline
$MgCl_2 \bullet 6H_2O$ MW 203.3

194801 RT **MINERAL OIL** — 1 vial, 5 vials
Molecular Biology Reagent
1 ml = approx. 0.84 gm
For PCR applications.
Each vial contains 1.5 ml.

1696054 **WATER** — 500 ml
For Cell Culture
Double deionized via reverse osmosis
Sterile
Storage temperature: 15-30°C

RESTRICTION ENZYMES

153798 -20°C **Aat II** — 500 U
5′...GACGT/C...3′
[84067-31-2]
Isolated from *Acetobacter aceti* (IFO 3281).
Activity: 15,000 to 25,000 units/ml. Supplied in 50 mM KCl,10 mM Tris-HCl (pH 7.4),0.1 mM EDTA, 1mM dithiothreitol, 200 µg/ml acetylated bovine serum albumin and 50% glycerol.
Aat II requires 50 mM K^+ ions, 20mM Tris-acetate, 10mM magnesium acetate, 1mM dithiothreitol (pH 7.9 at 25°C) for optimal activity. Incubate at 37°C. This enzyme cleaves pBR322 DNA 5-10 times more efficiently than lambda DNA. Purified free of *Aat* I.
Ref.: Sugisaki, H., Maekawa, Y., Kanazawa, S. and Takanami, M. (1982)*Nucleic Acids Res.* **10**, 5747-5752.

150221 0°C **Acc I** — 100 U, 500 U
5′...GT/(A,C)(T,G)AC...3′
[87683-74-7]
From *Acinetobacter calcoaceticus*
Supplied in 50% glycerol containing 10 mM Tris-HCl pH 7.5, 0.1 mM EDTA, 50 mM KCl, 1 mM dithiothreitol, 200 µg/ml acetylated bovine serum albumin.
Activity: 3,000 to 10,000 units/ml
Ref.: 1. Nelson, M. and McClelland, M., *Nucl. Acids Res.*, **s19**, 2045 (1991). 2. Zabeau, M. and Roberts, R.J., unpublished observations.

159381 -20°C **Acc III** — 200 U, 1 KU
5′...T/CCGGA...3′
From *Acinetobactor calcoaceticus*
Activity: 8,000 to 12,000 units/ml.
Supplied in 50 mM NaCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 500 µg/ml acetylated BSA, and 50% glycerol.
Isoschizomers: BspE I, Mro I. Incubation should be at 65°C, will exhibit approx. 10-25% activity at 37°C.

CATALOG NUMBER

159382 -20°C **Acc65 I** — 1 KU, 5 KU
5′...G/GTACC...3′
From *Acinetobactor calcoaceticus*
Isoschizomers: Kpn I, Asp718 I
Activity: 500 to 15,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.
Does not display star activity like Kpn I.

159383 -20°C **AccB7 I** — 200 U, 1 KU
5′..CCANNNN/NTGG...3′
From *Acinetobacter calcoa* B7
Activity: 8,000 to 12,000 units/ml.
Supplied in 300 mM NaCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 500 µg/ml acetylated BSA, and 50% glycerol.
It is not sensitive to overlapping *dcm* methylation like its isoschizomer PflM I. Also, possible star activity with low salt or high pH conditions.

159384 -20°C **Aci I** — 200 U, 1 KU
5′...C/CGC...3′
From *Arthrobacter citreus*
Activity: 5,000 to 15,000 units/ml.
Supplied in 100 mM NaCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

159385 -20°C **Acy I** — 100 U, 500 U
5′...GR/CGYC...3′
From *Anabaena cylindrica*
Activity: 3,000 to 20,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.6), 0.1 mM EDTA, 7 mM 2-mercaptoethanol, and 50% glycerol.

159386 -20°C **Afl II** — 1 KU, 5 KU
5′...C/TTAAG...3′
From *Anabaena flosaquae*
Activity: 5,000 to 15,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml, and 50% glycerol.

159387 -20°C **Afl III** — 250 U
5′...A/CPuPyGT...3′
From *Anabaena flosaquae*
Activity: 1,000 to 10,000 units/ml.
Supplied in 100mM NaCl, 50 mM Tris-HCl (pH 7.4), 10 mM $MgCl_2$, 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

159388 -20°C **Age I** — 100 U, 500 U
5′...A/CCGGT...3′
From *Agrobacterium gelatinovorum*
Activity: 1,000 to 5,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

CATALOG NUMBER

150277 -20°C **Alu I** 400 U, 2 KU
5′...AG/CT...3′
[81295-04-7]
From *Arthrobacter luteus* (ATCC 21606)
Solution in 50% glycerol containing 10 mM Tris-HCl pH 7.5, 0.1 mM EDTA, 50 mM KCl, 1.0 mM dithiothreitol, 200 µg/ml bovine serum albumin
Activity: 3,000 to 10,000 units/ml
Ref.: Recognition sequence from Roberts, R.J., Meyers, P.A. Morrison, A and Murry, K. (1976). J. Mol. Biol. 102, 157-165

159389 -20°C **Alu I METHYLASE** 100 U, 500 U
5′...AG/C-(CH_3)T...3′
From *Arthrobacter luteus*
Activity: 3,000 to 10,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.5), 0.1 mM EDTA, 1 mM DTT, 200 µg/ml acetylated BSA, and 50% glycerol.

159390 -20°C **Alw44 I** 1 KU, 5 KU
5′...G/TGCAC...3′
From *Acinetobactor iwoffi* RFL44
Activity: 8,000 to 12,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.5), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

159391 -20°C **Alw I** 100 U, 500 U
5′...GGATC($N)_4$/...3′
From *Acinetobacter lwoffii*
Activity: 500 to 5,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

159392 -20°C **AlwN I** 500 U
5′...CAGNNN/CTG...3′
From *Acinetobacter iwoffii N*
Activity: 5,000 to 15,000 units/ml.
Supplied in 50 mM NaCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 100 µg/ml acetylated BSA, and 50% glycerol.

153799 -20°C **Apa I** 2 KU, 5 KU, 25 KU
5′...GGGCC/C...3′
[85270-15-1]
Isolated from *Acetobacer pasteurianus* sub. *pasteurianus* (NCIB 7215).
Activity: 20,000 to 60,000 units/ml. Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1mM dithiothreitol, 200 µg/ml bovine serum albumin and 50% glycerol.
Apa I is sensitive to NaCl concentrations higher than 80 mM.
Ref.: Seurinck, J., van de Voorde, A. and van Montagu, M., (1983), Nucleic Acids Res., **11**, 4409-4415.

153800 -20°C **ApaL I** 1 KU, 5 KU
5′...G/TGCAC...3′
[100630-51-1]
Isolated from *Acetobacter pasteurianus*
Activity: 5,000 to 20,000 units/ml. Supplied in 50 mM KCl, 10 mM Tris-HCl (pH7.4), 0.1mM EDTA,1mM dithiothreitol, 200µg/ml acetylated bovine serum albumin and 50% glycerol.
Sensitive to NaCl concentrations higher than 50 mM.
Ref.: Yamada, Y. and Murakami, M., (1985), Agri.Biol.Chem., **49:12**, 3627-3629.

CATALOG NUMBER

159393 -20°C **Apo I** 500 U
5′...Pu/AATTPy...3′
From *Arthrobacter protophormiae*
Activity: 2,000 to 10,000 units/ml.
Supplied in 100 mM NaCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

159394 -20°C **Asc I** 50 U, 250 U
5′...GG/CGCGCC...3′
From *Arthrobacter* species
Activity: 1,000 to 5,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

159395 -20°C **Ase I** 2 KU, 10 KU
5′...AT/TAAT...3′
From *Aquaspirillum serpens*
Activity: 5,000 to 50,000 units/ml.
Supplied in 500 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

153814 -20°C **AspH I** 100 U, 500 U
5′...G($\frac{A}{T}$)GC($\frac{T}{A}$)C ... 3′
Isolated from *Achromobacter sp.*
Activity: 2,000 to 10,000 units/ml. Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml bovine serum albumin and 50% glycerol. High concentrations of salt (NaCl > 100 mM) is required for optimal activity.
Ref.: Brown, N.L., McClelland, M. and Whitehead, P.R., (1980), Gene, **9**, 49-68.

197021 -20°C **Ava I** 2 KU, 10 KU
5′...C/PyCGPuG...3′
[81295-06-9]
Derived from *Anabaena variabilis*
Activity: 2,000-10,000 units/ml.
Unit Definition: One unit of activity is defined by the amount of enzyme required to completely digest one microgram of lambda DNA in 60 minutes at 37°C in a total volume of .05 ml. Supplied in 50mM KCL, 10mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200µg/ml acetylated bovine serum albumin, and 50% glycerol.

197011 -20°C **Ava II** 100 U, 200 U, 500 U
5′...G/G(A,T)CC...3′
[81295-07-0]
Derived from *Anabaena variabilis* for sequence G/G (A,T) CC
Activity: 2,000-20,000 units/ml.
Unit Definition: One unit of activity is defined by the amount of enzyme required to completely digest one microgram of lambda DNA in 60 minutes at 37°C in a total volume of .05 ml. Supplied in 50mM KCL, 10mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1mM dithiothreitol, 200µg/ml acetylated BSA, and 50% glycerol.

159396 -20°C **Avr II** 100 U, 500 U
5′...C/CTAGG...3′
From *Anabaena variabilis* UW
Activity: 1,000 to 10,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 8.0), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

CATALOG NUMBER

153801 -20°C **Bal I** — 50 U
5′...TGG/CCA...3′
Isolated from *Brevibacterium albidum* (ATCC 15831).
Activity: 2000 to 10,000 units/ml.
Supplied in 50mM KCl, l0 mM Tris-HCl (pH 7.4), 0.1 mMEDTA, 1 mM dithiothreitol,200 μg/ml bovine serum albumin and 50% glycerol.
This enzyme is stable and a fraction of a unit can be incubated for extended periods of time (16 hrs) to give complete digestion of DNA. BAL I is sensitive to NaCl concentrations higher than 40 mM and to overlapping dcm methylation.
Ref.: Gelinas, R.E., Myers, P.A., Weiss, G.A., Roberts, R.J. and Murray, K.E., (1977), J. Mol. Biol., **114**, 433-440

150421 -20°C **BamH I** — 10 KU, 50 KU
5′...G/GATCC...3′
[81295-09-2]
From *Bacillus amylolique faciens*
Solution in 50% glycerol containing 10 mM Tris pH 7.5, 0.1mM EDTA, 50 mM KCl, 1 mM Dithiothreitol, 200 μg/ml acetylated Bovine Serum Albumin.
Activity: 2,000 to 20,000 units/ml
Ref.: Recognition sequence from: Roberts, R.J., Wilson, G.A. and Young, E., Nature, **265**, 82-84 (1977).

159397 -20°C **BamH I METHYLASE** — 100 U, 500 U
5′...G/GATC-(CH_3)C...3′
From *Bacillus amyloliquefaciens* H
Activity: 3,000 to 10,000 units/ml.
Supplied in 50 mM Tris-HCl (pH 7.5), 10 mM EDTA, 1 mM DTT, 200 μg/ml acetylated BSA, and 50% glycerol.

153802 -20°C **Ban I** — 5 KU, 25 KU
5′...G/GPyPuCC...3′
[85876-07-9]
Isolated from *Bacillus aneurinolyticus* (IAM 1077).
Activity: 10,000 to 60,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA,
1 mM dithiothreitol, 200 μg/ml bovine serum albumin and 50% glycerol. *Ban* I is sensitive to NaCl concentrations higher than 80 mM. Purified free of Ban II and III.
Ref.: Sugisaki, H., Maekawa, Y., Kanazawa, S. and Takanami, M., (1982), Nucleic Acids Res., **10**, 5747-5752. Schildkraut, I., Lynch, J. and Morgan, R., (1987), Nucleic Acids Res., **15**, 5492.

153803 -20°C **Ban II** — 1 KU, 5 KU
5′...GPuGCPy/C...3′
[84067-33-4]
Isolated from *Bacillus aneurinolyticus* (IAM 1077)
Activity: 4,000 to 20,000 units/ml.
Supplied in 50 mM KCl, 10 mM tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 μg/ml bovine serum albumin and 50%
glycerol.
Ref.: Sugisaki, H., Maekawa, Y., Kanazawa, S. and Takanami, M., (1982), Nucleic Acids Res., **10**, 5747-5752.

CATALOG NUMBER

159398 -20°C **Ban III** — 1 KU, 5 KU
5′...AT/CGAT...3′
From *Bacillus aneurinolyticus*
Activity: 3,000 to 20,000 units/ml.
Supplied in 100 mM KCl, 10 mM Tris-HCl (pH 7.5), 0.1 mM EDTA, 10 mM 2-mercaptoethanol, 500 μg/ml acetylated BSA, and 50% glycerol.

159399 -20°C **Bbs I** — 200 U, 1 KU
5′...GAAGAC($N)_2$/...3′
From *Bacillus laterosporus*
Activity: 1,000 to 10,000 units/ml.
Supplied in 150 mM KCl, 10 mM Tris-HCl (pH 7.5), 0.1 mM EDTA, 1 mM dithiothreitol, 200 μg/ml acetylated BSA, and 50% glycerol.

159400 -20°C **Bbu I** — 200 U, 1 KU
5′...GCATG/C...3′
From *Bacillus* sp.
Activity: 8,000 to 12,000 units/ml.
Supplied in 50 mM NaCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 500 μg/ml acetylated BSA, and 50% glycerol.

153804 -20°C **Bbv I** — 150 U
5′...GCAGC($N)_{8/12}$/...3′
Isolated from *Bacillus brevis* (ATCC 9999)
Activity: 200 to 2,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mMdithiothreitol, 200 μg/ml bovine serum albumin and 50% glycerol.
Ref.: Gingeras, T.R., Milazzo, J.P. and Roberts, R.J., (1978), Nucleic Acids Res., **5**, 4105-4127. Schildkraut,I., unpublished observations.

150426 -20°C **Bcl I** — 2 KU, 10 KU
5′...T/GATCA...3′
[81295-11-6]
From the thermophile *Bacillus caldolyticus* solution in 50% glycerol containing 10 mM Tris-HCl pH 7.5, 0.1 mM EDTA, 50 mM KCl, 1 mM dithiothreitol, 200 μg/ml bovine serium albumin.
Activity: 3,000 to 15,000 units/ml
Ref.: Recognition sequence from: Bingham, A.H.A., Atkinson, T., Sciaky, D. and Roberts, R.J., (1978), Nucleic Acids Res., **5**, 3457-3460.

159401 -20°C **Bfa I** — 500 U
5′...C/TAG...3′
From *Bacteroides fragilis*
Activity: 1,000 to 10,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 μg/ml acetylated BSA, and 50% glycerol.

150463 -20°C **Bgl I** — 1 KU, 5 KU
5′...GCCNNNN/NGGC...3′
[80449-04-3]
From *Bacillus globigii* Rub 561
Solution contains 50% glycerol containing 10 mM K_3PO_4 pH 7.4, 0.1 mM EDTA, 200 mM KCl, 10 mM 2-mercaptoethanol, 200 μg/ml bovine serum albumin.
Activity: 2,000 to 20,000 units/ml
Ref.: Recognition sequence from: Bickle, T.A. and Ineichen, K., (1980), Gene, **9**, 205-211; and Van Heuverswyn, H., and Fiers, W., (1980), Gene, **9**, 195-203.

CATALOG NUMBER

150464 -20°C **BgI II** — 1 KU, 5 KU
5′...A/GATCT...3′
[81295-12-7]
From *Bacillus globigii* Rub 562
Solution in 50% glycerol containing 10 mM Tris-HCl pH 7.4, 10 mM $MgCl_2$, 10 mM 2-mercaptoethanol, 100 µg/ml bovine serum albumin.
Activity: 3,000 to 40,000 units/ml
Ref.: Recognition sequence from: Pirotta, V., (1976), Nucleic Acids Res., **3**, 1747-1760.

159402 -20°C **Bpm I** — 50 U, 250 U
5′...CTGGAG(N)$_{16}$/...3′
From *Bacillus pumilus*
Activity: 1,000 to 5,000 units/ml.
Supplied in 100 mM NaCl, 50 mM Tris-HCl (pH 7.4), 10 mM $MgCl_2$, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

159403 -20°C **Bpu1102 I** — 200 U
5′...GC/TNAGC...3′
(Esp I)
Activity: 1,000 to 20,000 units/ml.
Supplied in a reaction bufer.

159404 -20°C **Bsa I** — 500 U
5′...GGTCTC(N)$_1$/...3′
From *Bacillus stearothermophilus*
Activity: 1,000 to 10,000 units/ml.
Supplied 100 mM NaCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

159405 -20°C **BsaA I** — 500 U
5′...PyAC/GTPu...3′
From *Bacillus stearothermophilus* A
Activity: 1,000 to 5,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

159406 -20°C **BsaB I** — 200 U, 1 KU
5′...GATNN/NNATC...3′
From *Bacillus stearothermophilus* B
Activity: 5,000 to 20,000 units/ml.
Supplied in 50 mM NaCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200µg/ml acetylated BSA, and 50% glycerol.

151256 -20°C **BsaH I** — 1 KU, 5 KU
5′...GPu/CGPyC...3′
[92228-42-7]
From *Bacillus stearothermophilus*
Solution in 50% glycerol containing 10 mM Tris-HCl pH 7.5, 0.1 mM EDTA, 50 mM KCl, 1.0 mM dithiothreitol, 200 µg/ml bovine serum albumin.
Activity: 2,000 to 20,000 units/ml
Ref.: Recognition Sequence from: Kroger, M., Hobom, G., Schutte, H. and Mayer, H., (1984), Nucleic Acids Res., **12**, 3127-3141.

159408 -20°C **BsaJ I** — 250 U
5′...C/CNNGG...3′
From *Bacillus stearothermophilus* J
Activity: 1,000 to 10,000 units/ml.
Supplied in 50 mM NaCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

CATALOG NUMBER

159409 -20°C **BsaW I** — 100 U, 500 U
5′...(A/T)CCGG(A/T)...3′
From *Bacillus stearothermophilis* WI
Activity: 1,000 to 10,000 units/ml.
Supplied in 100 mM NaCl, 50 mM Tris-HCl (pH 7.6), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol

159410 -20°C **Bsh1236 I** — 500 U
5′...CG/CG...3′
From *Bacillus sphaericus*
Activity: 3,000 to 10,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.5), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

159411 -20°C **BsiE I** — 1 KU, 5 KU
5′...CGPuPy/CG...3′
From *Bacillus stearothermophilis*
Activity: 5,000 to 15,000 units/ml.
Supplied in 50 mM NaCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

159412 -20°C **BsiHKA I** — 1 KU, 5 KU
5′...G(A/T)GC(A/T)C...3′
From *Bacillus stearothermophilis*
Activity: 5,000 to 15,000 units/ml.
Supplied in 100 mM NaCl, 50 mM Tris-HCl (pH 7.6), 0.1 mM EDTA, 1 mM dithiotheitol, 200 µg/ml acetylated BSA, and 50% glycerol.

159413 -20°C **BsI I** — 500 U
5′...CCNNNNN/NNGG...3′
From *Bacillus* species
Activity: 3,000 to 20,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

153805 -20°C **Bsm I** — 200 U, 1 KU
5′...GAATGC(N)$_{1/-1}$ /...3′
[122007-72-1]
Isolated from *Bacillus stearothermophilus* NUB 36 (N. Welker).
Activity: 4,000 to 20,000 units/ml.
Supplied in 50 mM KCl, 10mM Tris-HCl (pH 7.4),0.1mM EDTA, I mM dithiothreitol, 200 µg/ml bovine serum albumin and 50% glycerol.
Ref.: Myers, P.A. and Roberts, R.J., unpublished observations.
Christ, C. and Ingalls, D., unpublished observations.

159414 -20°C **BsmA I** — 1 KU, 5 KU
5′...GTCTC(N)$_1$/...3′
From *Bacillus stearothermophilis*
Activity: 3,000 to 20,000 units/ml.
Supplied in 200 mM KCl, 10 mM Tris-HCl (pH7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 500 µg/ml acetylated BSA, and 50% glycerol.

159415 -20°C **BsmF I** — 100 U, 500 U
5′...GGGAC(N)$_{10/14}$/...3′
From *Bacillus stearothermophilis* F
Activity: 2,000 to 10,000 units/ml.
Supplied in 50 mM NaCl, 10 mM Tris-HCl (pH 7.4), 1 mM dithiothreitol, 0.1 mM EDTA, 200 µg/ml acetylated BSA, and 50% glycerol.

CATALOG NUMBER

159416 -20°C **Bsp120 I** — 3 KU, 15 KU
5′...G/GGCCC...3′
Activity: 3,000 to 20,000 units/ml.
Supplied in reactive buffer.

150527 -20°C **Bsp1286 I** — 500 U, 2.5 KU
5′... G(G/A/T)GC(C/A/T)C...3′
From *Bacillus sphaericus*
Activity: 3,000 to 10,000 units/ml.
Solution in 50% glycerol containing 100 mM Tris-HCl pH 7.4, 50 mM KCl, 0.1 mM EDTA, 1.0 mM dithiothreitol, 200 µg/ml bovine serum albumin.
Ref.: Shibata, T., Ikawa, S., Kim, C. and Ando, T.J. (1976), J. Bacteriol, 128, 473-476. Recognition sequence from: Roberts, R.J. unpublished observations. Cleavage sequence from: Schildkraut, I. and Christ, C. unpublished observations.

159417 -20°C **BspD I** — 1 KU, 5 KU
5′...AT/CGAT...3′
From *Bacillus* species
Activity: 3,000 to 15,000 units/ml.
Supplied in 50 mM NaCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

159418 -20°C **BspE I** — 1 KU, 5 KU
5′...T/CCGGA...3′
From *Bacillus* sp.
Activity: 3,000 to 20,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

159419 -20°C **BspH I** — 200 U, 1 KU
5′...T/CATGA...3′
From *Bacillus* species H
Activity: 1,000 to 10,000 units/ml.
Supplied in 100 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

159420 -20°C **BspM I** — 100 U, 500 U
5′...ACCTGC(N)$_4$/...3′
From *Bacillus* species M
Activity: 1,000 to 5,000 units/ml.
Supplied in 150 mM KCl, 10 mM Tris-HCl (pH 7.4), 10 mM $MgCl_2$, 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

150528 -20°C **BssH II** — 100 U, 500 U
5′...G/CGCGC...3′
From *Bacillus stearothermophilus*
Strain H3
Activity: 4,000 to 20,000 units/ml.
Solution in 50% glycerol containing 10 mM Tris-HCl pH 7.4, 0.1 mM EDTA, 50 mM KCl, 1.0 mM dithiothreitol, 200 µg/ml bovine serum albumin.
Ref.: Langdale, J.A., Myers, P.A. and Roberts, R.J. unpublished observations. Cleavage sequence from: Schildkraut, I. and Greenough, L. unpublished observations.

159421 -20°C **Bst1107 I** — 200 U
5′...GTA/TAC...3′
Activity: 1,000 to 15,000 units/ml.
Supplied in reactive buffer.

CATALOG NUMBER

159422 -20°C **BstB I** — 2.5 KU
5′...TT/CGAA...3′
From *Bacillus stearothermophilus* B
Activity: 5,000 to 25,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

150529 -20°C **BstE II** — 2 KU, 10 KU
5′...G/GTNACC...3′
From *Bacillus stearothermophilus*
Activity: 5,000 to 50,000
Solution in 50% glycerol containing 10 mM Tris-HCl pH 7.4, 0.1 mM EDTA, 50 mM KCl, 1.0 mM dithiothreitol, 200 µg/ml bovine serum albumin.
Ref.: Recognition sequence from: Lautenberger, J.A., Edgell, M.H. and Hutchison, C.A. III, (1980), Gene, **12**, 171-174.

150530 -20°C **BstN I** — 2 KU, 10 KU
5′...CC(A/T)GG...3′
[81811-51-0]
From *Bacillus stearothermophilus*
Activity: 5,000 to 20,000
Solution in 50% glycerol containing 10 mM Tris-HCl pH 7.5, 0.1 mM EDTA, 50 mM KCl, 1.0 mM dithiothreitol, 200 µg/ml bovine serum albumin.
Ref.: Recognition sequence from: Langdale, J.A., Myers, P.A. and Roberts, R.J. unpublished observations.

159423 -20°C **BstU I** — 1 KU, 5 KU
5′...CG/CG...3′
From *Bacillus stearothermophilis* U
Activity: 3,000 to 20,000 units/ml.
Supplied in 50 mM NaCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

150531 -20°C **BstX I** — 1 KU, 2 KU, 5 KU
5′...CCANNNNN/NTGG...3′
[92228-43-8]
From *Bacillus stearothermophilus*
Activity: 5,000 to 15,000 units/ml
Solution in 50% glycerol containing 10 mM Tris-HCl pH 7.5, 0.1 mM EDTA, 1.0 mM dithiothreitol 50 mM KCl, 200 µg/ml bovine serum albumin.

159424 -20°C **BstY I** — 500 U
5′...Pu/GATCPy...3′
From *Bacillus stearothermophilis* Y
Activity: 3,000 to 15,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

159425 -20°C **Bsu36 I** — 500 U
5′...CC/TNAGG...3′
From *Bacillus subtilis* 36 I
Activity: 3,000 to 20,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.5), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

CATALOG NUMBER

159426 -20°C **Cfo I** — 3 KU, 15 KU
5′...GCG/C...3′
From *Clostridium formicoaceticum* sp.
Activity: 8,000 to 12,000 units/ml.
Supplied in 50 mM NaCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 500 µg/ml acetylated BSA, and 50% glycerol.

153806 -20°C **Cla I** — 500 U
5′...AT/CGAT...3′
[83589-01-9]
Isolated from *Caryophanon latum* L (H. Mayer)
Activity: 4,000 to 10,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml bovine serum albumin and 50% glycerol. *Cla* I is inhibited by overlapping *dam* methylation. Cleaves to produce a 5' CG extension which can be readily ligated with DNA fragments generated by *Aha* II,*Asu* II, *Hin*P I, *Hpa II, Mae* II,*Msp* I, *Nar* I, and *Taq* I.
Ref.: Mayer, H., Grosschedl, R., Schutte, H. and Hobom, G., (1981), Nucleic Acids Res., **19**, 4833-4845.

159427 -20°C **Cla I METHYLASE** — 500 U
5′...AT/CGA-(CH_3)T...3′
From *Caryophanon latum*
Activity: 3,000 to 10,000 units/ml.
Supplied in 50 mM Tris-HCl (pH 7.5), 10 mM EDTA, 5 mM 2-mercaptoethanol, 200 µg/ml acetylated BSA, and 50% glycerol.

159428 -20°C **dam METHYLASE** — 500 U
5′...GA-(CH_3)TC...3′
From *E. coli* with *dam* modification
Activity: 5,000 to 20,000 units/ml.
Supplied in 50 mM KCl, 50 mM Tris-HCl (pH 7.5), 10 mM EDTA, 1 mM DTT, 200 µg/ml acetylated BSA, and 50% glycerol.

153807 -20°C **Dde I** — 200 U, 500 U, 1 KU
5′...C/TNAG...3′
Isolated from *Desulfovibrio desulfuricans* (NCIB 8310).
Activity: 2,000 to 10,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml bovine serum albumin and 50% glycerol. Cleaves single-stranded DNA very slowly.
Ref.: Makula, R.A. and Meagher, R.B., (1980), Nucleic Acids Res., **8**, 3125-3131. Gelinas, R.E. and Roberts, R.J., unpublished observations.

153808 -20°C **Dpn I** — 1 KU, 5 KU
5′...GmA/TC...3′
[81295-14-9]
E. coli recombinant isolated from *Diplococcus pneumoniae* strain 641 (S. Lacks).
Activity: 5,000 to 20,000 units/ml.
Supplied in 100 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 0.1 mM dithiothreitol, 200 µg/ml bovine serum albumin and 50% glycerol.
Dpn I is an isoschizomer of *Sau* 3A I and *Mbo* I. However, *Dpn I* requires N^6-methylation of the A residues on both strands of the recognition sequence for cleavage activity.
Ref.: Lacks, S. and Greenberg, B., (1975), J. Biol. Chem., **250**, 4060-4066. Geier, G.E. and Modrich, P., (1979), J. Biol. Chem., **254**, 1048-1413. Lacks, S. and Greenberg, B., (1977), J. Mol. Biol., **114**, 153-168.

CATALOG NUMBER

159429 -20°C **Dpn II** — 1 KU, 5 KU
5′.../GATC...3′
From *E. coli*
Activity: 5,000 to 20,000 units/ml.
Supplied in 200 mM NaCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

190516 -20°C **Dra I** — 2 KU, 10 KU
5′...TTT/AAA..3′
[87843-68-3]
From *Deinococcus radiophilus* (ATCC 27603)
Activity: 5,000 to 20,000 units/ml.
Solution in 50% glycerol containing 10 mM Tris-HCl pH 7.5, 0.1 mM EDTA, 50 mM KCl, 1.0 mM dithiothreitol, 200 µg/ml bovine serum albumin.
Ref.:(1) Recognition Sequence from: Purvis, I.J., and Moseley, B.E.B., (1983), Nucleic Acid Res., **11**, 5467-5474; (2) Recognition Sequence from: Hedgpeth, J., Goodman, H.M. and Boyer, H.M., (1972), Proc. Natl. Acad. Sci. USA, **69**, 3448-3452.

159430 -20°C **Dra II** — 50 U, 250 U
5′...RG/GNCCY...3′
From *Deinococcus radiophilus*
Activity: 1,000 to 5,000 units/ml.
Supplied in 200 mM NaCl, 20 mM Tris-HCl (pH 8.0), 0.1 mM EDTA, 10 mM 2-mercaptoethanol, 500 µg/ml acetylated BSA, and 50% glycerol.

153809 -20°C **Dra III** — 150 U, 500 U
5′...CACNNN/GTG...3′
Isolated from *Deinococcus radiophilus* (ATCC 27603).
Activity: 2,000 to 15,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml bovine serum albumin and 50% glycerol.
Ref.: Grosskopt, R., Wolf, W., Kessler, C., (1985), Nucleic Acids Res., **13**, 1517-1528.

159431 -20°C **Drd I** — 300 U
5′...GACNNNN/NNGTC...3′
From *Deinococcus radiodurans*
Activity: 1,000 to 10,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

153810 -20°C **Eae I** — 100 U, 500 U
5′...Py/GGCCPu...3′
[86352-28-5]
Isolated from *Enterobacter aerogenes* (P.R. Whitehead).
Activity: 1,000 to 10,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml bovine serum albumin and 50% glycerol.
Ref.: Whitehead, P.R. and Brown, N.L., (1983), FEBS Letters, **155**, 97-101. Jacobs, D. and Brown, N.L., (1986), Biochem. J., **238**, 613-616.

159432 -20°C **Eag I** — 500 U
5′...C/GGCCG...3′
From *Enterobacter agglomerans*
Activity: 3,000 to 20,000 units/ml.
Supplied in 500 mM NaCl, 10 mM Tris-HCl (pH 8.2), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

CATALOG NUMBER

159433 -20°C **Ear I** — 500 U
5′...CTCTTC(N)$_1$/...3′
From *Enterobacter aerogenes*
Activity: 1,000 to 5,000 units/ml.
Supplied in 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

159434 -20°C **Eco130 I** — 1 KU, 5 KU
5′...C/CWWGG...3′
From *Escherichia coli*
Activity: >1,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

159435 -20°C **Eco47 I** — 200 U, 1 KU
5′...G/GWCC...3′
From *Escherichia coli*
Activity: 3,000 to 20,000 units/ml.
Supplied in 100 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

159436 -20°C **Eco47 III** — 200 U
5′...AGC/GCT...3′
Activity: 1,000 to 10,000 units/ml.
Supplied in reactive buffer.

159437 -20°C **Eco52 I** — 50 U, 250 U
5′...C/GGCCG...3′
From *Escherichia coli*
Activity: 1000 to 5,000 units/ml.
Supplied in 50 mM NaCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 500 µg/ml acetylated BSA, and 50% glycerol.

159438 -20°C **Eco57 I** — 100 U
5′...CTGAAG(N)$_{16}$/...3′
Activity: 1,000 to 15,000 units/ml.
Supplied in reagent buffer.

159439 -20°C **Eco72 I** — 200 U, 1 KU
5′...CAC/GTG...3′
Activity: 5,000 to 12,000 units/ml.
Supplied in 100 mM KCl, 10 mM Tris-HCl (pH 7.4), 1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

159440 -20°C **EcoN I** — 1 KU, 5 KU
5′...CCTNN/NNNAGG...3′
From *Escherichia coli*
Activity: 3,000 to 20,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.5), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

153811 -20°C **EcoO 109 I** — 2 KU, 10 KU
5′...PuG/GNCCPy...3′
[95725-92-1]
Isolated from *E. coli* H709c (I. Orskov).
Activity: 5,000 to 20,000 units/ml.
Supplied in 60 mM NaCl, 20 mM Tris-HCl (pH 8.2), 0.5 mM EDTA, 14 mM 2-mercaptoethanol, 50% glycerol. This enzyme is an isoschizomer of *Dra* II.
Ref.: Mise, K. and Nakajima, K., (1985), Gene, **36**, 363-367.

CATALOG NUMBER

151025 -20°C **EcoR I** — 10 KU, 50 KU
5′...G/AATTC...3′
From *E. coli.* RY13
Solution in 50% glycerol containing 5 mM Tris-KPO_4 pH 7.4, 0.1 mM EDTA, 5 mM 2-Mercaptoethanol, 400 mM NaCl, 0.15% Triton X-100, 200 µg/ml bovine serum albumin
Ref.: Recognition Sequence from: Hedgpeth, J., Goodman, H.M. and Boyer, H.M., (1972), Proc. Natl. Acad. Sci USA, **69**, 3448-3452.

For a complete selection of restriction enzymes, DNA/RNA modifying enzymes, linkers, primers, and vectors, please see the Molecular Biology Section.

159441 -20°C **EcoR I METHYLASE** — 10 KU, 50 KU
5′...G/AA-(CH$_3$)TTC...3′
From *Escherichia coli*
Activity: 5,000 to 40,000 units/ml.
Supplied in 200 mM NaCl, 100 mM KPO_4 (pH 7.4), 0.1 mM EDTA, 10 mM 2-mercaptocethanol, 200 µg/ml acetylated BSA, and 50% glycerol.

159442 -20°C **EcoR II** — 100 U, 500 U
5′.../CCWGG...3′
From *Escherichia coli*
Activity: 3,000 to 20,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.5), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

151026 -20°C **EcoR V** — 2 KU, 10 KU
5′...GAT/ATC...3′
[83589-02-0]
From *Escherichia coli.* J62P7G74
Activity: 5,000 to 20,000
Solution in 50% glycerol containing 10 mM Tris-HCl pH 7.4 0.1 mM EDTA, 50 mM KCl, 1.0 mM dithiothreitol, 200µg/ml bovine serum albumin.
Ref.: Recognition Sequence from: Kholmina, G.V., Rebentish, B.A., Skoblov, Yu.S., et al., Pokl. Akad. Nauk. SSSR, **253**, 495-497.

159443 -20°C **Fnu4H I** — 100 U, 500 U
5′...GC/NGC...3′
From *Fusobacterium nucleatum* 4H
Activity: 1,000 to 5,000 units/ml.
Supplied in 50 mM NaCl, 10 mM Tris-HCl (pH 7.4), 0,1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

159444 -20°C **FnuD II METHYLASE** — 200 U, 1 KU
5′...C-(CH$_3$)GCG...3′
From *Fusobacterium nucleatum* D
Activity: 5,000 to 15,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.5), 0.1 mM EDTA, 1 mM DTT, 200 µg/ml acetylated BSA, and 50% glycerol.

153812 -20°C **Fok I** — 1 KU, 5 KU
5′...GGATG(N)$_{9/13}$/...3′
Isolated from *Flavobacterium okeanokoites* (IFO 12536)
Activity: 2,000 to 12,000 units/ml. Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml bovine serum albumin and 50% glycerol.
Ref.: Sugisaki, H. and Kanazawa, S. (1981) *Gene 16, 73-78.*

CATALOG NUMBER

159445 -20°C **Fsp I** — 500 U
5′...TGC/GCA...3′
From *Fischerella* species
Activity: 1,000 to 5,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.5), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

151220 -20°C **Hae II** — 2 KU, 10 KU
5′...GG/CC...3′
[81295-17-2]
From *Haemophilus aegyptius* (ATCC11116)
Activity: 2,000 to 15,000 units/ml.
Solution in 50% glycerol containing 10 mM Tris-HCl pH 7.4, 0.1 mM EDTA, 50 mM KCl, 1.0 mM dithiothreitol, 200 µg/ml bovine serum albumin.
Ref.: Recognition Sequence from: Tu, C.-P.D., Roychoudhury, R. and Wu R., (1976), Biochem. Biophys. Res. Comm., **72**, 355-362.

151221 -20°C **Hae III** — 3 KU, 15 KU
5′...GG/CC...3′
[81295-18-3]
Source: *E.coli* strain that carries the cloned Hae III gene from*Haemophilus aegyptius*
Supplied in 100 mM KCl, 10 mM Tris-HCl, pH 7.4, 0.1 mM EDTA, 10 mM 2-mercaptoethanlol, 500 µg/ml BSA, 50% glycerol.
Activity: 5,000 to 20,000 units/ml.
Ref.: Recognition Sequence from: Kroger, M., Hobom, G., Schutte, H. and Mayer, H., (1984), Nucleic Acids Res., **12**, 3127-3141.

159446 -20°C **Hae III METHYLASE** — 250 U
5′...GG/C-(CH_3)C...3′
From *Haemophilus aegyptius*
Activity: 1,000 to 5,000 units/ml.
Supplied in 50 mM KCl, 50 mM Tris-HCl (pH 7.5), 10 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

153813 -20°C **Hga I** — 50 U, 250 U
5′...GACGC$(N)_{5/10}$/...3′
Isolated from *Haemophilus gallinarum* (ATCC 14385)
Activity: 500 to 2,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml bovine serum albumin and 50% glycerol. Cleaves to produce a five-base 5' extension. Cleaves single-stranded DNA very slowly.
Ref.: Takanami, M., (1974), Methods in Mol. Biol., **7**, 113-133.
Brown, N.L. and Smith, M., (1977), Proc. Nat'l. Acad. Sci. USA, **74**, 3213-3216. Sugisaki, H., (1978), Gene, **3**, 17-28.

151257 -20°C **Hha I** — 2 KU, 10 KU
5′...GCG/C...3′
[81295-20-7]
From *Haemophilus haemolyticus* (ATCC 10014)
Activity: 10,000 to 25,000 units/ml
Solution in 50% glycerol containing 150 mM KCl, 5 mM KPO_4 pH 7.4, 0.1 mM EDTA, 150 mM KCl, 1.0 mM dithiothreitol, 200 µg/ml bovine serum albumin.
Ref.: Recognition Sequence from: Roberts, R.J., Myers, P.A., Morrison, A. and Murry, L., (1976), J. Mol. Biol., **103**, 199-208.

CATALOG NUMBER

159407 -20°C **Hha I METHYLASE** — 1 KU, 5 KU
5′...GC-(CH_3)G/C...3′
From *Haemophilus haemolyticus*
Activity: 5,000 to 25,000 units/ml.
Supplied in 50 mM NaCl, 50 mM Tris-HCl (pH 7.5), 10 mM EDTA, 5 mM 2-mercaptoethanol, 200 µg/ml acetylated BSA, and 50% glycerol.

151258 -20°C **HinC II** — 1 KU, 5 KU
5′...GTPy/PuAC...3′
[81811-55-4]
From *Haemophilus influenzae* R_c
Solution in 50% glycerol containing 10 mM Tris-HCl pH 7.4, 0.1 mM EDTA, 50 mM KCl, 1.0 mM dithiothreitol 200 µg/ml bovine serum albumin.
Activity: 5,000 to 25,000 units/ml.
Ref.: Recognition Sequence from: Kelly, T.J., Jr. and Smith, H.O., (1970), J. Mol. Biol., **51**, 393-409 [1] Landy, A., Ruedisueli, E., Robinson, L., Foeller, C. and Ross, W., (1974), Biochemistry, **13**, 2134-2142.

197020 0°C **HinD II** — 100 U, 1 KU
5′...GTPy/PuAC...3′
Derived from *Haemophilus influenzae Rd com*$^{-10}$
Activity: 2,000-10,000 units/ml.
Unit Definition: One unit of activity is defined by the amount of enzyme required to completely digest one microgram of lambda DNA in 60 minutes at 37°C in a total volume of .05 ml.

151259 -20°C **HinD III** — 10 KU, 50 KU
5′...A/AGCTT...3′
[81295-22-9]
From *Haemophilus influenzae*
Activity: 10,000-100,000
Solution in 50% glycerol containing 10 mM Tris-HCl pH 7.4, 0.1 mM EDTA, 50 mM KCl, 1.0 mM dithiothreitol, 200 µg/ml bovine serum albumin.
Ref.: Recognition Sequence from: Old, R., Murry, K., and Roizes, G., (1975), J. Mol. Biol., **92**, 331-339 [1] Gromkova, R., Bendier, J. and Goodgal, S., (1973), J. Bacteriol., **r**, 1151.

151260 -20°C **HinF I** — 5 KU, 25 KU
5′...G/ANTC...3′
[81295-23-0]
From *Haemophilus influenza*
Solution in 50% glycerol containing 10 mM Tris-HCl pH 7.4, 0.1 mM EDTA, 50 mM KCl, 1.0 mM dithiothreitol, 200 µg/ml bovine serum albumin.
Activity: 2,000 units-10,000 units/ml.
Ref.: Recognition and Cleavage Sequence from: Hutchinson, C.A. III and Barreli, B.G., unpublished observations.

151261 -20°C **$HinP_1$ I** — 2 KU, 10 KU
5′...G/CGC...3′
[95229-16-6]
From *Haemophilus influenzae*
Solution in 50% glycerol containing 10 mM Tris-HCl pH 7.4, 0.1 mM EDTA, 50 mM KCl, 1.0 mM dithiothreitol, 200 µg/ml bovine serum albumin.
Activity: 5,000 to 20,000 units/ml.
Ref.: Recognition and Cleavage Sequence from: Shen, S., Li, Q., Yan, P., Zhou, B., Ye, S., Lu, Y., and Wang, D., (1980), Science Sin., **23**, 1435-1442.

CATALOG NUMBER

151266 -20°C **Hpa I** — 500 U
5′...C/CGG...3′
[81295-24-1]
From *Haemophilus parainfluenzae*
Solution in 50% glycerol containing 10 mM Tris-HCl pH 7.5, 0.1 mM EDTA, 1.0 mM dithiothreitol, 200 µg/ml bovine serum albumin.
Activity: 2,000 to 10,000 units/ml
Ref.: Recognition Sequence from: Garfin, D.E. and Goodman, H.M., (1974), Biochem. Biophys. Res. Comm., **59**, 108-116.

151267 -20°C **Hpa II** — 500 U, 1 KU, 5 KU
5′...C/CGG...3′
From *Haemophilus parainfluenzae*
Solution in 50% glycerol containing 10 mM Tris-HCl pH 7.4, 0.1 mM EDTA, 50 mM KCl, 1.0 mM dithiothreitol, 200 µg/ml bovine serum albumin.
Activity: 2,000 to 20,000 units/ml
Ref.: Recognition Sequence from: Garfin, D.E. and Goodman, H.M., (1974), Biochem. Biophys. Res. Comm., **59**, 108-116.

159447 -20°C **Hpa II METHYLASE** — 100 U, 500 U
5′...C/C-(CH_3)GG...3′
From *Haemophilus parainfluenzae*
Activity: 1,000 to 5,000 units/ml.
Supplied in 50 mM Tris-HCl (pH 7.5), 10 mM EDTA, 5 mM 2-mercaptoethanol, 200 µg/ml acetylated BSA, and 50% glycerol.

153815 -20°C **Hph I** — 50 U, 250 U, 500 U
5′...GGTGA(N)$_{8/7}$/...3′
[81295-26-3]
Isolated from *Haemophilus parahaemolyticus* (C.A. Hutchison III)
Activity: 1,000 to 10,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml bovine serum albumin and 50% glycerol. Unstable during incubation at 37°C.
Ref.: Middleton, J.H., Stankus, P.V., Edgell, M.H. and Hutchinson, C.A. III, unpublished observations. Kleid, D., Humayun Z., Jeffrey A. and Ptashne, M., (1976), Proc. Natl. Acad. Sci. USA, **73**, 293-297.

159448 -20°C **Kas I** — 100 U, 500 U
5′...G/GCGCC...3′
From *Kluyvera ascorbata*
Activity: 1,000 to 5,000 units/ml.
Supplied in 300 mM KCl, 10 mM Tris-HCl (pH 7.4), 10 mM $MgCl_2$, 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

151405 **Kpn I** — 2 KU, 10 KU
5′...GGTAC/C...3′
[81295-27-4]
From *Klebsiella pneumonia* OK8
Solution in 50% glycerol containing 10 mM Tris-HCl pH 7.4, 0.1 mM EDTA, 50 mM KCl, 1.0 mM dithiothreitol, 200 µg/ml bovine serum albumin.
Activity: 2,000 to 20,000 units/ml.
Ref.: Recognition Sequence from: Tomassini, J., Roychoudhury, R., and Roberts, R.J. (1978) Nucleic Acids Res. 5, 4055-4064.

CATALOG NUMBER

151590 -20°C **Mbo I** — 200 U, 1 KU
5′... /GTAC ...3′
[81295-28-5]
From *Moraxella bovis* (ATCC 10900)
Solution in 50% glycerol containing 10 mM tris-HCl pH 7.4, 0.1 mM EDTA, 50 mM KCl, 1.0 mM dithiothreitol, 200 µg/ml bovine serum albumin.
Activity: 5,000 to 15,000 units/ml
Ref.: Recognition sequence from: Gelinas, R.E., Myers, P.A., and Roberts, R.J., (1977), J. Mol. Biol., **114**, 169-179.

153816 -20°C **Mbo II** — 250 U, 500 U
5′...GAAGA(N)$_{8/7}$/...3′
[81295-29-6]
Isolated from *Moraxella bovis* (ATCC 10900).
Activity: 2,000 to 20,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml bovine serum albumin and 50% glycerol. *Mbo* II is sensitive to overlapping *dam* methylation. Purified free of *Mbo* I.
Ref.: Brown, N.L., Hutchison, C.A. III, and Smith, M., (1980), J. Mol. Biol., **140**, 143-148. Gelinas, R.E., Myers, P.A. and Robers, R.J., (1977), J. Mol. Biol. **114**, 169-179. Endow, S.A., (1977), J. Mol. Biol., **114**, 441-449. McClelland, M., Nelson, M. and Cantor, C.R., (1985), Nucleic Acids Res., **13**, 7171-7182.

151701 -20°C **Mlu I** — 1 KU, 5 KU
5′...A/CGCGT...3′
[81458-04-0]
From *Micrococcus luteus*
Solution in 50% glycerol containing 10 mM tris-HCl pH 7.4, 0.1 mM EDTA, 50 mM KCl, 1.0 mM dithiothreitol, 200 µg/ml bovine serum albumin.
Activity: 1,000 to 10,000 units/ml
Ref.: Sugisaki, H., and Kanazawa, S. (1981) Gene 16, 73-78.

151702 -20°C **Mnl I** — 100 U
5′...CCTC(N)$_7$...3′
From *Moraxella nonliquefaciens*
Solution in 50% glycerol containing 10 mM tris-HCl pH 7.4, 0.1 mM EDTA, 50 mM KCl, 1.0 mM dithiothreitol.
Activity: 400 to 2,000 units/ml
Ref.: Cleavage Site from: Schildkraut, I. and Greenough, L., unpublished observations.

159449 -20°C **Mro I** — 40 U, 200 U
5′...T/CCGGA...3′
From *Micrococcus roseus*
Activity: 3,000 to 15,000 units/ml.
Supplied in 200 mM NaCl, 10 mM Tris-HCl (pH 7.5), 0.1 mM EDTA, 5 mM 2-mercaptoethanol, 200µg/ml BSA, and 50% glycerol.

159450 -20°C **Msc I** — 100 U, 500 U
5′...TGG/CCA...3′
E. coli recombinant from *Micrococcus* species
Activity: 3,000 to 15,000 units/ml.
Supplied in 150 mM KCl, 10 mM Tris-HCl (pH 7.5), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

CATALOG NUMBER

159451 -20°C **Mse I** 200 U, 1 KU
5′...T/TAA...3′
From *Micrococcus* species
Activity: 4,000 to 20,000 units/ml.
Supplied in 50 mM NaCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

159452 -20°C **Msl I** 200 U, 1 KU
5′...CAPyNN/NNPuTG...3′
From *Moraxella osloensis*
Activity: 4,000 to 20,000 units/ml.
Supplied in 100 mM NaCl, 10 mM Tris-HCl (pH 7.6), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

151717 -20°C **Msp I** 5 KU, 25 KU
5′...C/CGG...3′
[81811-56-5]
From *Moraxella* species
Solution in 50% glycerol containing 10 mM Tris-HCl pH 7.5, 0.1 mM EDTA, 50 mM KCl, 1.0 mM dithiothreitol, 200 µg/ml bovine serum albumin.
Activity: 3,000 to 20,000 units/ml
Ref.: (1) Schildkraut, I., and Greenough, L. unpublished results; (2) Waalwijk, C., and Flavell, R.A., (1976), Nucleic Acids Res., **5**, 3231-3236.

159453 -20°C **Msp I METHYLASE** 5 KU, 25 KU
5′...C-(CH_3)/CGG...3′
From *Moraxella* species
Activity: 4,000 to 20,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 8.0), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

159454 -20°C **Mun I** 100 U, 500 U
5′...C/AATTG...3′
Activity: 8,000 to 10,000 units/ml.
Supplied in 100 mM KCl, 10 mM Tris-HCl (pH 7.4), 1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

159455 -20°C **Mwo I** 250 U
5′...GCNNNNN/NNGC...3′
From *Methanobaceterium wolfeii*
Activity: 4,000 to 20,000 units/ml.
Supplied in 100 mM NaCl, 50 mM Tris-HCl (pH 7.6), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

153819 -20°C **Nae I** 200 U, 1 KU
5′...GCC/GGC...3′
Isolated from *Nocardia aerocolonigenes* (ATCC 23870)
Activity: 4,000 to 12,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml bovine serum albumin and 50% glycerol. *Nae* I exhibits marked different cleavage rates for different DNA sequences surrounding the recognition site.
Ref.: Wilson, G., Comb, D., Greenough, L. and Schildkraut, I., unpublished observations.

CATALOG NUMBER

153820 -20°C **Nar I** 200 U, 1 KU
5′...GG/CGCC...3′
[93586-00-6]
Isolated from *Nocardia argentinensis* (ATCC 31306).
Activity: 2,000 to 20,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml bovine serum albumin and 50% glycerol. Similar to *Nae* I, *Nar* I exhibits marked different cleavage rates for different sites depending on the surrounding DNA sequences. Sensitive to high concentrations of salt (NaCl > 80 mM). Unstable during incubation at 37°C.
Ref.: Comb, D., Wilson, G., Schildkraut, I. and Greenough, L., unpublished observations.

151733 -20°C **Nci I** 2 KU, 10 KU
5′...CC/(C/G)GG...3′
[95076-97-4]
From *Neisseria cinerea*
Solution in 50% glycerol containing 10 mM Tris-HCl pH 7.4, 0.1 mM EDTA, 50 mM KCl, 1.0 mM dithiothreitol, 200 µg/ml bovine serum albumin.
Activity: 2,000 to 10,000 units/ml
Ref.: Recognition sequence from: Watson, R., Zuker, M., Martin, S.M. and Visentin, L.P., (1980), FEBS Letters, **118**, 47-50.

151734 -20°C **Nco I** 1 KU, 5 KU
5′...C/CATGG...3′
[107824-63-5]
From *Nocardia corallina*
Solution in 50% glycerol containing Tris-HCl pH 7.4, 0.1 mM EDTA, 50 mM KCl, 1.0 mM dithiothreitol, 200 µg/ml bovine serum albumin.
Activity: 2,000 to 20,000 units/ml
Ref.: Recognition sequence from: Langdale, J.A., Myers, P.A. and Roberts, R.J. unpublished observations.

151735 -20°C **Nde I** 4 KU, 20 KU
5′...CA/TATG...3′
[84628-87-5]
From *Neisseria denitrificans*
Solution in 50% glycerol containing 10 mM Tris-HCl pH 7.4, 0.1 mM EDTA, 50 mM KCl, 1.0 mM dithiothreitol, 200 µg/ml bovine serum albumin.
Activity: 3,000 to 20,000 units/ml
Ref.: Watson, R.J., Schildkraut, I., Qiang, B.Q., Martin, S.M., and Visentin, L.P., (1982), FEBS Letters, **150**, 114-116.

153821 -20°C **Nhe I** 500 U
5′...G/CTAGC...3′
[92228-45-0]
Isolated from *Neisseria mucosa* subsp. *heidelbergensis* (ATCC 25999)
Activity: 4,000 to 20,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.5), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml bovine serum albumin and 50% glycerol. Cleaves to produce a 5' CTAG extension which is readily ligated to DNA fragments generated by *Avr* II, *Spe* I, and *Xba* I.
Ref.: Comb, D., Grandoni, R. and Schildkraut, I., unpublished observations.

CATALOG NUMBER

159456 -20°C **NIa III** — 500 U
5′...CATG/...3′
From *Neisseria lactamica*
Activity: 4,000 to 20,000 units/ml.
Supplied in 200 mM KCl, 10 mM Tris-HCl (pH 7.5), 0.1 mM EDTA, 1 mM dithiothreitol, 500 µg/ml acetylated BSA, and 50% glycerol.
MW 312.4

159457 -20°C **NIa IV** — 200 U, 1 KU
5′...GGN/NCC...3′
From *Neisseria lactamica*
Activity: 4,000 to 20,000 units/ml.
Supplied in 150 mM KCl, 10 mM Tris-HCl (pH 7.5), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

153836 -20°C **Not I** — 500 U
5′...GC/GGCCGC...3′
[103780-20-7]
Isolated from *Nocardia otitdis-caviarum* (ATCC14630)
Activity: 2,000 to 20,000 units/ml.
Supplied in 200 mM NaCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM DTT, 0.15% Triton X-100, 200 µg/ml bovine serum albumin and 50% glycerol.
Not I and *Sfi* are the only two known 8-base recognizing restriction endonucleases.
Ref.: Borsetti, R., Wise, D. and Schildkraut, L. unpublished observations. Schildkraut, I., Wise, D., Borsetti, R., and Qiang, B.-Q., unpublished observations.

151776 -20°C **Nru I** — 1 KU, 5 KU
5′...TCG/CGA...3′
[92228-46-1]
From *Nocardia rubra*
Solution in 50% glycerol containing 10 mM Tris-HCl pH 7.4, 0.1 mM EDTA, 50 mM KCl, 1.0 mM dithiothreitol, 200 µg/ml bovine serum albumin.
Activity: 5,000 to 50,000 units/ml.
Ref.: Recognition and cleavage site from: Schildkraut, I. and Greenough, L. unpublished observations.

153822 -20°C **Nsi I** — 1 KU, 5 KU
5′...ATGCA/T...3′
[122097-02-3]
Isolated from *Neisseria sicca* (ATCC 29256)
Activity: 4,000 to 20,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml bovine serum albumin and 50% glycerol. This enzyme is an isoschizomer of *Ava* III.
Ref.: Schildkraut, I., Jones, G., Parker, P., Grandoni, R. and Comb, D., unpublished observations.

159458 -20°C **Pac I** — 100 U, 500 U
5′...TTAAT/TAA...3′
From *Pseudomonas alcaligenes*
Activity: 1,000 to 5,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

CATALOG NUMBER

151797 -20°C **PaeR7 I** — 2 KU, 10 KU
5′...C/TCGAG...3′
[84522-61-2]
From *Pseudomonas aeruginosa*
Solution in 50% glycerol containing 10 mM Tris-HCl pH 7.4, 0.1 mM EDTA, 50 mM KCl, 1.0 mM dithiothreitol, 200 µg/ml serum albumin.
Activity: 2,000 to 40,000 units/ml.
Ref.: Recognition Sequence from: Gingeras, T.R. and Brooks, J., (1983), Nat'l. Acad. Sci. USA, **80**, 402-406.

159459 -20°C **PflM I** — 200 U, 1 KU
5′...CCANNNN/NTGG...3′
From *Pseudomonas fluorescens*
Activity: 4,000 to 20,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.5), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

159460 -20°C **Pme I** — 100 U, 500 U
5F128é...GTTT/AAAC...3′
From *Pseudomonas medicina*
Activity: 4,000 to 20,000 units/ml.
Supplied in 100 mM NaCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

159461 -20°C **PmI I** — 200 U, 1 KU
5′...CAC/GTG...3′
From *Pseudomonas maltophila*
Activity: 4,000 to 20,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 10 mM $MgCl_2$, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

159463 -20°C **PpuM I** — 100 U, 500 U
5′...PuG/G(A/T)CCPy...3′
From *Pseudomonas putida* sp.
Activity: 1000 to 5,000 units/ml.
Supplied in 100 mM NaCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

153837 -20°C **Pst I** — 10 KU, 50 KU
5′...CTGCA/G...3′
[81295-32-1]
Source: *Providencia stuartii*
Activity: 5,000 to 40,000 units/ml
Storage buffer: 10 mM Tris-HCl, pH 7.5, 100 mM NaCl, 0.1 mM EDTA, 1 mM dithiothreitol, 0.15% (v/v) Triton x-100, 50% (v/v) glycerol.
Ref.: 1. Smith, D.I., Blattner, F.R., and Davies, J., (1976), Nucleic Acids Res., **3**, 343-353.

159464 -20°C **Pst I METHYLASE** — 100 U
5′...C-(CH_3)CGG...3′
From *Providencia stuartii*
Activity: 1,000 to 5,000 units/ml.
Supplied in 50 mM KCl, 50 mM Tris-HCl (pH 7.5), 10 mM EDTA, 10 mM mercaptoethanol, 200 µg/ml acetylated BSA, and 50% glycerol.

CATALOG NUMBER

151978 -20°C **Pvu I** 100 U, 500 U
5′...CGAT/CG...3′
[81295-33-2]
From *Proteus vulgaris*
Activity: 1,000 to 10,000 units/ml.
Solution in 50% glycerol containing 10 mM Tris-HCl pH 7.4, 0.1 mM EDTA, 50 mM KCl, 1.0 mM dithiothreitol, 200 µg/ml bovine serum albumin.
Ref.: Recognition and Cleavage Sequence from: Gingeras, T.R., Greenough, L., Schildkraut, I. and Roberts R.J., (1981), Nucleic Acids Res., **9**, 4525-4536.

151979 -20°C **Pvu II** 5 KU, 25 KU
5′...CAG/CTG...3′
[81295-34-3]
From *Proteus vulgaris*
Activity: 2,000 to 15,000 units/ml.
Solution in 50% glycerol containing 5 mM KPO_4 (pH 7.0), 0.05 mM EDTA, 5 mM 2-mercaptoethanol, 100 µg/ml bovine serum albumin.
Ref.: Recognition and Cleavage Sequence from: Gingeras, T.A., Greenough, L., Schildkraut, I. and Roberts, R.J., (1981), Nucleic Acids Res., **9**, 4525-4536.

152035 -20°C **Rsa I** 1 KU, 5 KU
5′...GT/AC...3′
[80449-06-5]
From *Rhodopseudomonas sphaeriodes*
Activity: 5,000 to 40,000 units/ml.
Solution in 50% glycerol containing 10 mM Tris-HCl, 0.1 mM EDTA, 50 mM KCl, 1.0 mM dithiothreitol, 200 µg/ml bovine serum albumin.
Ref.: Recognition Sequence from Lynn, S.P., Cohen, L.K., Kaplan, S. and Gardner, J.F., (1980), J. Bacteriol., **142**, 380-383.

153823 -20°C **Rsr II** 100 U, 500 U
5′...CG/G(A/T)CCG...3′
[93229-62-0]
Isolated from *Rhodopseudomonas sphaeroides* (S. Kaplan).
Activity: 500 to 5,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml bovine serum albumin and 50% glycerol. Sensitive to NaCl concentrations higher than 50 mM.
Ref.: O'Connor, C.D., Metcalf, E., Wrighton, C.J., Harris, T.J.R. and Saunders, J.R., (1984), Nucleic Acids Res., **12**, 670l-6708.

151450 0°C **Sac I** 1 KU, 5 KU
5′...GAGCT/C...3′
[81295-35-4]
From *Streptomyces achromogenes*
Activity: 2,000 to 20,000 units/ml.
Solution in 50% glycerol containing 10 mM Tris-HCl pH 7.4, 0.1 mM EDTA, 1.0 mM dithiothreitol, 200 µg/ml bovine serum albumin.
Ref.: Recognition sequence from: Arrand, J.R., Myers, P.A. and Roberts, R.J., unpublished observations.

CATALOG NUMBER

153824 -20°C **Sac II** 2 KU, 10 KU
5′...CCGC/GG...3′
[81295-36-5]
Isolated from *Streptomyces achromogenes* (ATCCL 12767)
Activity: 2,000 to 30,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml bovine serum albumin and 50% glycerol. Purified free of *Sac* I and III. *Sac* II is an isoschizomer of *Sst II*. Sensitive to NaCl concentrations higher than 50 mM. *Sac* II exhibits very different cleavage rates for different sites depending on the surrounding DNA sequences.
Ref.: Arrand, J.R., Myers, P.A. and Roberts, R.J., unpublished observations.

152041 -20°C **Sal I** 2 KU, 10 KU
5′...G/TCGAC...3′
[81295-38-7]
From *Streptomyces albus*
Solution in 50% glycerol containing 5 mM KPO_4 pH 7.4, 0.1 mM EDTA, 50 mM KCl, 5 mM 2-mercaptoethanol, 500 µg/ml bovine serum albumin.
Activity: 2,000 to 20,000 units/ml
Ref.: Arrand, J.R., et al., J. Mol. Biol., **118**, 127 (1979).

159465 -20°C **Sap I** 25 U
5′...GCTCTTC(N)$_1$/...3′
From *Saccharopolyspora* species
Activity: 1,000 to 5,000 units/ml.
Supplied in 150 mM NaCl, 10 mM Tris-HCl (pH 7.5), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

153838 -20°C **Sau3A I** 200 U, 1 KU
5′...N/GATC...3′
[81725-92-0]
Source: *Staphylococcus aureus* 3A
Storage Buffer: 10 mM Tris-HCl, pH 7.5, 50 mM KCl, 0.1 mM EDTA, 1.0 mM dithiothreitol, 250 µg/ml bovine serum albumin, 50% (v/v) glycerol.
Ref.: 1. Sussenbach, J.S., Monofoort, C.H., Schiphof, R. and Stobbering, E.E., (1976), *Nucleic Acids Res*., **3**, 3193-3202.

153825 -20°C **Sau96 I** 1 KU, 5 KU
5′...G/GNCC...3′
[81811-57-6]
Isolated from *Staphylococcus aureus* PS96 (E. E. Stobberingh).
Activity: 5,000 to 15,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml bovine serum albumin and 50% glycerol. This enzyme is an isoschizomer of *Asu* I. *Sau96* I is inhibited by overlapping *dcm* methylation.
Ref.: Sussenbach J.S., Steenberg, P.H., Rost, J.A., van Leeuwen, W.J. and van Embden, J.D. A., (1978), *Nucleic Acids Res*., **5**, 1153-1163.

CATALOG NUMBER

152048 -20°C **Sca I** — 1 KU, 5 KU
5′...AGT/ACT...3′
[95329-12-7]
From *Streptomyces caespitosus*
Solution in 50% glycerol containing 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 50 mM KCl, 1.0 mM dithiothreitol, 200 µg/ml bovine serum albumin.
Activity: 1,000 to 8,000 units/ml
Ref.: Kojima, H., Takahashi, H., and Saito, H., unpublished observations.

152051 -20°C **ScrF I** — 1 KU, 5 KU
5′...CC/NGG...3′
[85537-83-3]
From *Streptococcus cremoris*
Solution in 50% glycerol containing 10 mM Tris-HCl pH 7.4, 0.1 mM EDTA, 50 mM KCl, 1.0 mM dithiothreitol, 200 µg/ml bovine serum albumin.
Activity: 1,000 to 10,000 units/ml
Ref.: Recognition sequence from: Fitzgerald, G.F., Daly, C., Brown, L.R. and Gingeras, T.R., (1982), Nucleic Acids Res., **10**, 8171-8179.

159466 -20°C **SfaN I** — 20 U, 100 U
5′...GCATC(N)$_5$/...3′
From *Streptococcus faecalis*
Activity: 500 to 2,000 units/ml.
Supplied in 250 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

159467 -20°C **Sfc I** — 50 U, 250 U
5′...C/TPuPyAG...3′
From *Streptococcus faecium*
Activity: 1,000 to 5,000 units/ml.
Supplied in 150 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 400 µg/ml acetylated BSA, and 50% glycerol.

153839 -20°C **Sfi I** — 2 KU, 10 KU
5′...GGCCNNNN/NGGCC...3′
[91930-79-9]
Source: Streptomyces fimbriatus
Activity: 2,000 to 10,000 units/ml.
Storage buffer: 10 mM Tris-HCl, pH 7.5, 50 mM KCl, 0.1 mM EDTA, 1 mM Dithiothreitol, 200 µg/ml bovine serum albumin, 50% (v/v) glycerol.
Ref.: 1. Qiang, B.-Q. and Schildkraut, I., (1984), *Nucleic Acids Res*., **12**, 4507-4515.

159468 -20°C **Sin I** — 200 U, 1 KU
5′...G/G(A/T)CC...3′
From *Salmonella infantis*
Activity: 8,000 to 12,000 units/ml.
Supplied in 50 mM NaCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 500 µg/ml acetylated BSA, and 50% glycerol.

152059 -20°C **Sma I** — 2 KU, 10 KU
5′...CCC/GGG...3′
[82391-42-2]
From *Serratia marcescens*
Solution in 50% glycerol containing 10 mM Tris-HCl pH 7.4, 0.1 mM EDTA, 50 mM KCl, 1.0 mM dithiothreitol, 200 µg/ml bovine serum albumin
Activity: 5,000 to 20,000 units/ml
Ref.: Recognition Sequence from: Endow, S.A., and Roberts, R.J., (1977), J. Mol. Biol., **112**, 521-529.

CATALOG NUMBER

153827 -20°C **SnaB I** — 100 U, 500 U
5′...TAC/GTA...3′
[103780-21-8]
Isolated from *Sphaerotilus natans* (ATCC 15291).
Activity: 2,000 to 10,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml bovine serum albumin and 50% glycerol. Sensitive to NaCl concentrations higher than 100 mM.
Ref.: Borsetti, R., Grandoni, R. and Schildkraut, I., unpublished observations.

153828 -20°C **Spe I** — 200 U, 1 KU
5′...A/CTAGT...3′
[115926-60-8]
Isolated from *Sphaerotilus species* (ATCC 13923)
Activity: 1,000 to 10,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml bovine serum albumin and 50% glycerol. Cleaves to produce a 5' CTAG extension which can be readily ligated to DNA fragments generated by *Avr* II, *Nhe* I, or *Xba* I.
Ref.: Comb, D. and Grandoni, R., unpublished observations.

152071 -20°C **Sph I** — 100 U, 500 U
5′...GCATG/C...3′
[85270-15-1]
From *Streptomyces phaeochromogenes*
Solution in 50% glycerol containing 10 mM Tris-HCl pH 7.4, 0.1 mM EDTA, 50 mM KCl, 1.0 mM dithiothreitol, 200 µg/ml bovine serum albumin.
Activity: 1,000 to 4,000 units/ml
Ref.: Recognition Sequence from: Fuchs, L.Y., Covarrubias, L., Escalante, L., Sanchez, S. and Bolivar, F., (1980), Gene, **10**, 39-46.

153829 -20°C **Ssp I** — 200 U, 500 U, 1 KU
5′...AAT/ATT...3′
Isolated from *Sphaerotilus species* (ATCC 13925)
Activity: 2,000 to 10,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml bovine serum albumin and 50% glycerol. *Ssp* I, *Ase* I, *Dra* I (*Aha* III) and *Mse* I are the only known restriction endonucleases that recognize pure AT containing sequences.
Ref.: Schildkraut, I. and Grandoni, R., unpublished observations.

153830 -20°C **Stu I** — 1 KU, 5 KU
5′...AGG/CCT...3′
[84788-83-0]
Isolated from *Streptomyces tubercidicus* (H. Takahashi)
Activity: 4,000 to 25,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4),0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml bovine serum albumin and 50% glycerol. Inhibited by overlapping *dcm* methylation.
Ref.: Shimotsu, H., Takahashi, H. and Salto, H., (1980), *Gene*, **11**, 219-225.

CATALOG NUMBER

153831 -20°C **Sty I** 3 KU, 15 KU
5′...C/C$^{AA}_{TT}$GG...3′
[96880-98-7]
Isolated from *Salmonella typhi 27* (E.S. Anderson)
Activity: 5,000 to 30,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml bovine serum albumin and 50% glycerol.
Ref.: Mise, K. and Nakajima, K., (1985), *Gene*, **33,** 357-361. Mise, K., unpublished observations.

152095 -20°C **Taq I** 4 KU, 20 KU
5′...T/CGA...3′
From an *E.coli strain that carries a Taq I overproducing plasmid pFBLT88*
Solution in 50% glycerol containing 300 mM KCl, 10 mM Tris-HCl, pH 7.5, 1 mM EDTA, 1 mM DTT, 500 µg/ml BSA.
Activity: 5,000 to 50,000 units/ml
Ref.: Recognition sequence from: Sato, S., Hutchison, C.A. III and Harris, J.I., (1977), Proc. Natl. Acad. Sci. USA, **74**, 542-546.

159469 -20°C **Taq I METHYLASE** 1 KU, 5 KU
5′...T/CGA-(CH$_3$)...3′
From *Thermus aquaticus*
Activity: 4,000 to 20,000 units/ml.
Supplied in 100 mM NaCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

159470 -20°C **Tfi I** 100 U, 500 U
5′...G/A($^{A}_{T}$)TC...3′
From *Thermus filiformis*
Activity: 1,000 to 5,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

159471 -20°C **Tru9 I** 200 U, 1 KU
5′...T/TAA...3′
From *Thermus ruber* 9
Activity: 8,000 to 12,000 units/ml.
Supplied in 50 mM NaCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 500 µg/ml acetylated BSA, and 50% glycerol.

159472 -20°C **Tsp509 I** 100 U, 500 U
5′.../AATT...3′
From *Thermus* species
Activity: 4,000 to 20,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

153832 -20°C **Tth 111 I** 400 U, 1 KU
5′...GACN/NNGTC...3′
Isolated from the thermophile *Thermus thermophilus* 111 (T. Oshima).
Activity: 2,000 to 20,000 units/ml.
Supplied in 200 mM KCl, 10 mM Tris-HCl (pH 7.8), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml bovine serum albumin and 50% glycerol. Purified free of *Tth*111 II. Ligation can be improved after filling in the extensions with Klenow Fragment.
Ref.: Shinomiya, T. and Sato, S., (1980), *Nucleic Acids Res.*, **8**, 43-56.

CATALOG NUMBER

197010 -20°C **Xba I** 3 KU, 15 KU
5′...T/CTAGA...3′
[81295-42-3]
From *Xanthomonas badrii*
Activity: 5,000-20,000 units/ml.
Supplied in 50 mM NaCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200µg/ml acetylated BSA, and 50% glycerol.

159473 -20°C **Xcm I** 100 U, 500 U
5′...CCANNNNN/NNNNTGG...3′
From an *E. coli* strain carrying a plasmid sequence from *Xanthomonas campestris*
Activity: 10,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml acetylated BSA, and 50% glycerol.

153840 -20°C **Xho I** 4 KU, 20 KU
5′...C/TCGAG...3′
[81295-43-4]
Source: *Xanthomonas holicola.*
Storage Buffer: 20 mM Tris-HCl, pH 7.5, 50 mM KCl, 0.1 mM EDTA, 1.0 mM dithiothreitol, 100 µg/ml bovine serum albumin, 50% (v/v) glycerol.
Ref.: 1. Gingeras, J.R., Myers, P.A., Olson, J.A., Hanberg, F.A., Roberts, R.J., (1978), *J. Mol. Biol.*, **118**, 113-122.

153833 -20°C **Xho II** 100 U, 500 U
5′...Pu/GATCPy...3′
Isolated from *Xanthomonas holcicola* (ATCC 13461).
Activity: 500 to 10,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-Hcl (pH 7.4), 0.1 mM EDTA, 10 mM 2-mercaptoethanol, 0.01% Triton X-100, 200 µg/ml bovine serum albumin, and 50% glycerol. A trace of *Xho* I cleavage may be detected upon overdigestion of *Xho* II. Cleaves the hybrid site generated by ligating between *Bam*H I and *Bgl* II digested DNA fragments. The hybrid site is resistant to cleavage by either *Bam*H I or *Bgl* II.
Ref.: Olson, J.A., Myers, P.A. and Roberts, R.J., unpublished observations. Kramarov, V.M., Masanov, A.L. and Smolyaninov, V. V., (1982), *Bioorg. Khim.*, **8**, 220-223. Gingeras, T.R. and Roberts, R.J., unpublished observations.

153834 -20°C **Xma I** 50 U, 250 U
5′...C/CCGGG...3′
[81295-45-6]
Isolated from *Xanthomonas malvacearum* (ATCC 9924).
Activity: 500 to 5,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 µg/ml bovine serum albumin and 50% glycerol.
Ref.: Endow, S.A. and Roberts, R.J., (1977), *J. Mol. Biol.*, **112**, 521-529.

159474 -20°C **Xma III** 500 U
5′...C/GGCCG...3′
Activity: 5,000 to 20,000 units/ml.
Supplied in 100 KCl, 20 mM Tris-HCl (pH 7.6), 0.1 mM EDTA, 10 mM β-mercaptoethanol, 500 µg/ml acetylated BSA, and 50% glycerol.

CATALOG NUMBER

153835 -20°C **Xmn I** 600 U 3 KU
5′...GAANN/NNTTC...3′
Isolated from *Xanthomonas manihotis* 7AS1 (B.-C. Lin).
Activity: 2,000 to 20,000 units/ml.
Supplied in 50 mM KCl, 10 mM Tris-HCl (pH 7.4), 0.1 mM EDTA, 1 mM dithiothreitol, 200 μg/ml bovine serum albumin and 50% glycerol. Sensitive to NaCl concentrations higher than 80 mM.
Ref.: Lin, B.-C., Chien, M.-C. and Lou, S.-Y., (1980), *Nucleic Acids Res.*, **8**, 6189-6198. Qiang, B.-Q. and Schildkraut, I., unpublished observations.

DNA AND NUCLEIC ACID MODIFYING ENZYMES

151004 -20°C **DNA-GYRASE** 100 U 250 U
(Topoisomerase II, Supercoiling Enzyme)
Purified from *Micrococcus luteus* cells.
Introduces negative superhelical turns into covalently closed DNA by double-stranded breakage and rejoining of phosphodiester bonds. Can catenate and decatenate, and provides a rapid and convenient method for supercoiling closed duplex DNAs such as plasmids.
Unit Definition: One unit catalyzes the conversion of 0.5 μg relaxed pBR322 DNA to a supercoiled state in 30 min. at 37°C.
Concentration: 5-15 units/μl in 100mM Tris HCl (pH 7.5), 20mM 2-mercaptoethanol, 1mg/ml BSA, 20% (v/v) glycerol.
Ref.: 1.)Klevan, L and Wang,J.C., Biochemistry, **19**, 5229 (1980).
2.) Gellert, M., Ann. Rev. Biochem., **50**, 879 (1981).

151005 -20°C **DNA LIGASE** 100 U 500 U
[9015-85-4]
From T4-infected *E. coli*
T4 DNA Ligase catalyzes the joining of two strands of DNA between the 5′-phosphate and 3′-hydroxyl groups of adjacent nucleotides. It has been shown to join RNA to either DNA or RNA in a duplex molecule, but not single-stranded nucleic acids.
Unit Definition: One unit (Weiss) is the amount of enzyme that catalyzes the exchange of 1 nmole of ^{32}P from pyrophosphate into α,β-^{32}P-ATP in 20 minutes at 37°C.
Storage Buffer: 10 mM Tris-HCl, pH 7.4, 50 mM KCl, 0.1 mM EDTA, 1mM DTT, 50% glycerol.

152278 -20°C **DNA LIGASE** 200 U 1 KU
[9015-85-4]
From T4 infected *E. coli*
T4 DNA Ligase catalyzes the formation of phosphodiester bonds between adjacent 5′-phosphoryl and 3′-hydroxyl groups in duplex DNA with concomitant cleavage of ATP to AMP with pyrophosphate. Unlike the *E. coli* DNA Ligase, this enzyme catalyzes the joining of duplex DNA molecules at blunt ends, as well as, sealing single-strand nicks in duplex DNA, and also covalently joining DNA fragments with complementary cohesive ends.
Unit Definition: One unit is defined as the amount of enzyme required to convert 1 nmole of ^{32}P from pyrophosphate into Nori-adsorbable form in 20 min. at 37°C
Supplied in a solution of 10 mM Tris-HCl, pH 7.5, 50 mM KCl, 1 mM DTT, 50% glycerol
Ref.: (1) Weiss, B., et al., J. Biol. Chem. **243,** 4543-4555; (2) Pheiffer, B.H., Zimmerman, S.B., Nucleic Acid Res., **14**, 7853 (1983).

CATALOG NUMBER

151006 -20°C **DNA LIGASE** 10 μg 25 μg
[9015-85-4]
From *E. coli*
E. coli DNA Ligase catalyzes the formation of a phosphodiester bond between duplex fragments with cohesive ends.
Unit Definition: One unit is defined as the amount of enzyme required to yield 50% ligation of Hind III fragments of λ DNA in 30 min. at 16°C in 20 μl of our assay mixture (30 mM Tris-HCl, pH 8.0, 4mM $MgCl_2$, 1.2 mM EDTA, 1.0 mM DTT, 0.026 mM NAD^+, 0.05 mg/ml BSA, and Hind III fragments of λ DNA, incubated at 16°C for 30 min.) with a DNA terminus concentration of 0.024 μM (56 μg/ml).
Supplied in a solution of 10 mM Tris-HCl, pH 7.4, 50 mM KCl, 0.1 mM EDTA, 10 mM Ammonium Sulfate, 1.0 mM DTT, 50% glycerol
Ref.: (1) Okayama, H., Berg, P., Mol. Cell. Biol., **2**, 161 (1982); (2) Gubler, U., Hoffman, B.J., Gene, **25**, 263 (1983).

151007 -20°C **DNA POLYMERASE** 100 U 500 U
[9012-90-2]
From T4-infected *E. coli*
Catalyzes the 5′-3′synthesis of DNA, by a single-strand DNA template. Also useful to label 3′-end duplex DNA. Also has been used in place of nick translation for labeling DNA probes.
Unit Definition: One unit catalyzes the incorporation of 10 nmole of total nucleotide into acid insoluble product in 30 minutes at 37°C.
Storage Buffer: 0.2 M Potassium phosphate, pH 6.5, 2 mM DTT, 50% glycerol

151008 -20°C **DNA POLYMERASE I** 100 U 250 U 500 U 1 KU
[9012-90-2]
From *E. coli.*
Unit Definition: One unit is defined as the amount of enzyme required to incorporate 10 nmoles of deoxyribonucleotide into acid-insoluble material in 30 minutes at 37°C with DNase I-activated DNA as the template-primer.
Supplied in a solution of 50 mM potassium phosphate, pH 7.0, 0.025 mM DTT, and 50% glycerol.
Ref.: (1) Lehman, I.R., The Enzymes, **14,** 15-37 (1981); (2) Rigby, D.W.J., et al., J. Mol. Biol., **113**, 237-251 (1977).

151009 -20°C **DNA POLYMERASE I Klenow Fragment** 100 U 500 U
[9012-90-2]
Klenow fragment, from *E. coli.*
This enzyme is prepared from subtilisin treated DNA Polymerase I. This 75,000 Dalton Klenow fragment retains both the polymerase and 3′-exonuclease activities of DNA Polymerase I, but does lack the 5′-exonuclease activity.
Unit Definition: 1 unit is defined as the amount of enzyme required to incorporate 10 nmole of total nucleotide into acid-soluble form in 30 min., at 37°C.
Supplied in 50 mM potassium phosphate buffer, pH 7.5, 0.025 mM DTT, 50% glycerol
Ref.: (1) Klenow, H., Henningsen, I., Proc. Natl. Acad. Sci., **65,** 168 (1970); (2) Richardson, C.C., Schildkraut, C.L., et al., J. Biol. Chem., **239,** 222 (1964).

CATALOG NUMBER

151935 -20°C **POLYNUCLEOTIDE KINASE** 500 U, 1 KU, 3 KU
[37211-65-7]
From T_4 infected *E. coli*
T_4 Polynucleotide Kinase catalyzes the transfer of the γ-phosphate of ATP to a 5′-OH terminus in DNA or RNA.
Unit Definition: One unit is defined as the amount of enzyme required to transfer one nmole of γ-phosphate from ATP to the 5′-OH terminus of salmon sperm DNA fragments in 30 minutes, at 37°C.
Supplied in a solution of 50 mM Tris-HCl, pH 7.6, 25 mM KCl, 1 mM DTT, 0.1 µM ATP, 0.1 mM EDTA, and 50% glycerol.
Ref.: (1) Richarson, C.C., Prog. in Nuc. Acid. Res. and Mol. Biol., **2**, 815 (1971); (2) Donis-Keller, H., Nuc. Acids. Res., **8**, 3133 (1980).
Caution: Kinase activity is inhibited by phosphate and ammonium ions.

800708 **POLYNUCLEOTIDE KINASE, T_4** 500 U
From T_4 infected *E. coli*
T_4 Polynucleotide Kinase catalyzes the transfer of the γ-phosphate of ATP to the 5′-hydroxy terminus of polynucleotides (DNA and RNA). T_4 PNK is useful for 5′-end-labelling of nucleic acids with ^{32}P prior to sequencing. It is also used to phosphorylate synthetic linkers and fragments of DNA or RNA prior to ligation. The kinase also possesses a 3′-phosphatase activity.
Unit Definition: One unit will transfer one nmol of γ-phosphate from ATP to the 5′-hydroxy termini of DNA (salmon sperm) fragments in 30 minutes at 37°C.
Shipping & Storage: Solution in 50 mM Tris-HCl, pH 7.6, 25 mM KCl, 1 mM DTT, 0.1 µM ATP, 0.1 mM EDTA and 50% glycerol. Shipped on dry ice.

REVERSE TRANSCRIPTASE
From Avian Myeloblastosis Virus
Approx. 30,000 units/ml
Unit Definition: One unit is the amount required to incorporate 1 nmol of [^{3}H]-TMP into nucleic acid product in 10 minutes at 37°C.
Solution: 0.2 M potassium phosphate, pH 7.2, 2.0 mM DTT, 0.2% Triton X-100 and 50% glycerol
Synthetic Activity: Globin mRNA at least 95% of cDNA product made in 5 minutes at 37°C was determined to be full length.
This product is free of nonspecific nucleases and no acid soluble RNA fragments are formed after incubation of 40 units of Reverse Transcriptase with 1.0 µgm of [^{3}H]-RNA for 60 minutes at 37°C.

855928 500 U
855929 1 KU

152020 -70°C **REVERSE TRANSCRIPTASE** 500 U, 1 KU
From Moloney Murine Leukemia Virus
Murine Reverse Transcriptase is an RNA-dependent DNA polymerase that synthesizes a complementary DNA strand from single-stranded RNA or DNA in the presence of a primer. This enzyme is multifunctional, containing both reverse transcriptase and RNase H activities (similar to AMV reverse transcriptase).
Unit Definition: One unit is the amount of enzyme required to incorporate 1 nmol of labeled dATP into acid-insoluble material in 10 min at 37°C.
Supplied in a 50 mM Tris-HCl buffer, pH 8.0, 1 mM EDTA, 5 mM dithiothreitol, 0.1% nonidet P-40, 0.1mM NaCl and 50% glycerol.
Ref.: Roth, M.J., Tanese, N., and Goff, S.P., J. Biol. Chem., **260**, 9326-9335 (1985).

CATALOG NUMBER

152098 0°C **TERMINAL DEOXYNUCLEOTIDYL TRANSFERASE** 100 U, 500 U
(TDT; Terminal Transferase)
From Calf Thymus
Unit Definition: One unit equals the amount of enzyme that incorporates 1 nmole of deoxyadenylic acid into polymer in 1 hour, pH 7.0 at 37°C
Activity: ≥10 units/µl
Caution: This enzyme may lose activity during incubation in low protein concentration solutions. We, therefore, recommend a minimum of 10 mg/ml protein concentration.
Ref.: (1) Bollum, F.J., J. Biol. Chem. **237**, 1945-1949 (1962).

152311 -20°C **TOPOISOMERASE I** 200 U, 500 U
(DNA Relaxing Enzyme)
From Calf Thymus
Relaxes both negatively and positively supercoiled DNA, catenates and decatenates nicked duplex DNA rings.
Unit Definition: One unit catalyzes conversion of 0.5 µg superhelical φx174 RF DNA to the relaxed state in 30 min. at 37°C
Concentration: 5-15 units/µl in 30 mM KPO_4 (pH 7.0), 5 mM DTT, 0.1 mM Na_2 EDTA, 0.1 mM BSA, 0.1% Triton X-100, 50% (v/v) glycerol.
Ref.: 1.) Gellert, M., *Ann. Rev. Biochem*., **50**, 879 (1981). 2.) Wang, J.C. and Liu, L.F., in *Molecular Genetics* part III, p. 82, Academic Press (1979).
Also see DNA Gyrase

TOPOISOMERASE II
See DNA Gyrase

RNA MODIFYING ENZYMES

101075 0°C **RIBONUCLEASE** 100 mg, 1 g, 5 g
[9001-99-4]
From Beef Pancreas
E.C. 2.7.7.16
Lyophilized powder, salt-free, protease-free
Prepared from 5X cryst material
Activity: ~70 units/mg material
Unit Definition: One unit causes the hydrolysis of RNA at a rate such that the velocity constant (k) equals 1 at 25°C and pH 5.0

152024 0°C **RIBONUCLEASE** 50 mg, 100 mg, 1 g
[9001-99-4]
From Bovine Pancreas
E.C.2.7.7.16
Lyophilized powder, salt-free, protease-free
Prepared from chromatographically homogeneous Ribonuclease A.
Activity: ~90 units/mg material
Unit Definition: Same as Ribonuclease 101075

101076 0°C **RIBONUCLEASE A** 100 mg, 250 mg, 1 g
[9001-99-4]
From Beef Pancreas
Prepared from aggregate-free RNase; Lyophilized;
Activity: 50 Kunitz units/mg.
Free of phosphate and protease; any aggregates can be converted to monomers:
Ref.: J. Biol. Chem., **240**, 3868 (1965).

CATALOG NUMBER

101084 0°C **RIBONUCLEASE B** — 50 mg, 100 mg, 500 mg, 1 g
From Beef Pancreas
Activity: 50 Kunitz units/mg.
Salt and protease free
Prep'd from cryst. RNase

104907 0°C **RIBONUCLEASE B** — 10 mg, 100 mg, 500 mg
Lyophilized; Phosphate Free
Essentially protease-free
Activity: Approx. 100 Kunitz units/mg

152025 0°C **RIBONUCLEASE H** — 25 U, 100 U
[9050-76-4]
From *E. coli*
RNase H is an endonuclease that cleaves the RNA of RNA-DNA hybrids, producing a 3′-hydroxyl and a 5′-phosphate at the cleavage point. However, RNase H does not hydrolyze either RNA-RNA or DNA-DNA hybrids, or single-stranded RNA or DNA.
Unit Definition: One unit is the amount of enzyme required to produce 1 nmole of acid-soluble ribonucleotides from [^{3}H]poly(A) ù poly(dT) in 20 min, at 37°C
Our RNase H has been tested for contaminating DNase, endonuclease, RNase III and non-specific RNase.
Offered in a 25 mM HEPES buffer, pH 8.0, 50 mM KCl, 1 mM DTT in 50% glycerol.
Ref.: Donis-Keller, H., Nucleic Acids Res., **1**, 179 (1979); (2) Okayama, H., Berg., P., Mol. Cell. Biol., **2**, 161 (1982).

101079 0-5°C **RIBONUCLEASE T$_1$** — 100 KU, 500 KU
[9026-12-4]
From *Aspergillus oryzae,*
E.C.3.1.27.1
Suspension in 0.70 saturated ammonium sulfate. Highly purified.
Activity: >300,000 units/mg.
Unit Definition: One unit will produce acid soluble oligonucleotides to cause a ΔA_{260} of 1.0 at pH 7.5 and 37°C.

SP6 RNA POLYMERASE
Isolated from SP6 phage-infected *Salmonella typhimurium.* The enzyme is very specific for the SP6 phage promoter sequences in DNA. These promoter sequences, when inserted into cloning vectors, can be used to synthesize refined RNA transcripts from the cloned DNA sequence. These transcripts are useful as hybridization probes and substrates for RNA processing.
Unit Definition: One unit incorporates 1.0 nmol ATP into an acid soluble form in one hour at 37°C.
Shipping & Storage: Solution in 100 mM NaCl, 50 mM Tris-HCl, pH 7.9, 1 mM EDTA, 20 mM 2-mercaptoethanol, and 50% glycerol.
Shipped on dry ice.

800709 — 200 U
800710 — 1 KU

CATALOG NUMBER

800711 -20°C **T$_7$ RNA POLYMERASE** — 5 KU
Isolated from *E. coli*
The enzyme is very specific for T_7 promoters. These promoter sequences, when inserted into cloning vectors, can be used to synthesize RNA transcripts of the cloned DNA sequences. These transcripts are useful as hybridization probes and substrates for RNA systems.
Unit Definition: One unit catalyzes the incorporation of 1 nmol of labeled ribonucleotide into acid precipitable material in one hour at 37°C.
Shipping & Storage: Solution in 20 mM potassium phosphate, pH 7.5, 0.1 mM EDTA, 0.1 mM DTT and 50% glycerol.
Shipped on dry ice.

Expedite Your T7/SP6 Transcription With ICN.

- SP6/T7 Polymerase
- SP6/T7 Primers
- α-^{32}P Ribonucleotides
- *Ultra-Pure* Reagents
- Linbro® MicroTubes
- Cloning Vectors
- Restriction Enzymes
- Buffers
- *And Much More...*

152031 -20°C **T$_7$ RNA POLYMERASE** — 5 KU, 25 KU
T_7 RNA Polymerase is a DNA dependent RNA polymerase which has specificity for T_7 phage promoters. This allows the enzyme to efficiently synthesize *in vitro* transcripts from almost any DNA that is downstream from a T_7 promoter.
Unit Definition: One unit is the amount of enzyme required to incorporate 1 nmol of labelled UTP into acid-soluble material in 60 min at 37°C.
Supplied in a 50 mM Tris-HCl buffer, pH 7.9, 0.1M NaCl, 0.1 mM EDTA, 1.0 mM dithiothreitol and 50% glycerol.
Ref.: (1) Chamberlin, M., and Ring, J., J. Biol. Chem., **248**, 2235-2244 (1973); (2) Tabor, S., and Richardson, C.C., Proc. Natl. Acad. Sci. USA, **82**, 1074-1078 (1985).

CLONING AND EXPRESSIONS VECTORS

3131010 -20°C **AURORA™ AP BASIC REPORTER VECTOR** — 20 µg
Reporter vector (pSEAP) for expressing Secreted Alkaline Phosphatase (SEAP) in mammalian cells.
Lacking eukaryotic promoter and enhancer sequences, it serves as either a negative control or cloning vehicle for strong promoters. The SEAP gene is followed by the SV40 late polyadenylation and transcription pause sites (reduces background transcription). An f1 origin of replication allows for single-stranded DNA production. The pUC19 origin and ampicillin resistance gene allow for propagation and selection in *E. coli*.

3131040 -20°C **AURORA™ AP CONTROL REPORTER VECTOR** — 20 µg
AP Control Vector with the SV40 early promoter inserted upstream and enhancer inserted downstream of the SEAP gene.
The promoter sequence contains the SV40 origin of replication useful in cells expressing the T-antigen of SV40. It is useful as a positive control or as a reference for comparing the activities of promoters and enhancers.

CATALOG NUMBER

3131030 -20°C **AURORA™ AP ENHANCER REPORTER VECTOR** — 20 µg
AP Enhancer Vector with the SV40 enhancer downstream of the SEAP gene.
Ideal for the study of promoters cloned into the multiple cloning sites. Potentially, the SV40 enhancer can increase the transcriptional activity of weak promoters inserted in the MCS.

3131020 -20°C **AURORA™ AP PROMOTER REPORTER VECTOR** — 20 µg
AP Basic Vector that includes the SV40 early promoter (no enhancer) inserted upstream of the SEAP gene.
The promoter fragment includes an SV40 origin of replication for expression in cells that actively express the SV40 T-antigen. pSEAP Promoter Vector may be used to analyze enhancer sequences cloned into one of the unique sites in the vector.

0921100 -20°C **AcMNPV C6 Wild Type Virus** — 2 ml

0910400 -20°C **pAcUW31 TRANSFER VECTOR** — 15 µg
Transfer vector for high-level expression of cloned genes under the control of **two** potent AcMNPV polyhedrin promoters.
Designed for high level expression of two different genes in the same cell.
Complete construct information is available upon request.

0910100 -20°C **BAC-UP6 VIRAL DNA** — 15 µg
Derivative of AcMNPV that facilitates the production of recombinant viral expression vectors from AcMNPV transfer vectors.
A transfection reagent is provided with Bac-Up6 DNA for efficient co-transfections.

0910200 -20°C **pBAC-UP8** — 15 µg
Transfer vector for high-level expression of cloned genes under the control of the potent AcMNPV polyhedrin promoter.
Complete construct information is available upon request.

0910300 -20°C **pBAC-UP9** — 15 µg
Transfer vector for high-level expression of cloned genes under the control of the potent AcMNPV polyhedrin promoter.
Complete construct information is available upon request.

0920200 -20°C **BAC-UP BACULOVIRUS EXPRESSION KIT** — 1 kit
The complete kit includes the following material, sufficient to perform 5 transfections:

- 2 Different transfer vectors for high-level expression of cloned genes driven by the potent AcMNPV polyhedrin promoter.
- Bsu36 I viral DNA digest.
- Transfection reagent.
- IPLB-Sf21 *Spodoptera frugiperda* cells.
- Positive control virus stock.
- Negative control AcMNPV wild-type virus.
- Bac1 sequencing/PCR Primer.
- Bac2 sequencing/PCR Primer.
- Positive control plasmid pBac-up8-GUS.

0921000 -20°C **BAC-UP VIRUS STOCK** — 2 ml

CATALOG NUMBER

DNA PLASMID VECTORS

821220 **LAMBDA gt10 VECTOR** — 10 µg
λgt 10 is a 43.34 Kb insertion vector with a unique EcoR I restriction site within the repressor (cl) gene. It can accept restriction fragments up to approximately 7.5 Kb in length, such as cDNA molecules with EcoR I ends. λgt 10 does not require an insert to be packageable and is thus much more efficient at cloning smaller fragments, such as cDNA molecules of 400-1500 base pairs, than other related lambda insertion vectors.
λgt 10 is supplied as an aqueous solution in 10 mM tris HCl, pH 8.0, 1 mM EDTA at a concentration of 0.5 µg/µl.

821221 **LAMBDA gt11 VECTOR** — 10 µg
λgt 11 is a 43.70 Kb expression vector containing a unique EcoR I restriction site within lacZ gene positioned 53 bp upstream from the termination codon. Open reading frames within the inserted DNA fragments may be expressed as fusion proteins with the lacZ gene product, β-galactosidase. Libraries constructed in λgt 11 can be screened using antibody probes that recognize antigens specified by the insert DNA. The functional β-galactosidase of gt 11 is usually inactivated by insertion of foreign DNA and the percentage of recombinants can easily be seen by the relative number of blue and clear plaques when libraries are plated in the presence of X-gal and IPTG.
λgt 11 is supplied as an aqueous solution in 10 mM tris HCl, pH 8.0, 1 mM EDTA at a concentration of 0.5 µg/µl.

ICN Reagents for Lambda Library Screening:

- *Protein-A, [^{125}I]*
- *Biotrans™ PVDF*
- *Petri Plates*
- *Ampicillin*
- *Agar*
- *Antibodies*
- *IPTG*

197101 0-5°C **LAMBDA PHAGE DNA** — 500µg, 2mg
Produced from a *C1857 S7 Lysogen of E. coli*
200-400 µg. as determined by absorbancy at 260 nm.
One OD_{260} unit is approximately 50 micrograms of Lambda DNA. Optical density ratios are used as a criterion of purity, with a typical analysis giving A_{250}/A_{260} = .89 at pH 7.0 and A_{250}/A_{260} = .52 at pH 7.0.
The viral DNA is extracted by a modification of the phenol method described by Kaiser and Hogness.
Ref.: 1. Hedgpeth, J., Goodman, H.M., and Boyer, H.W., Proc. Nat. Acad. Sci. USA, **69**, 3448 (1972).
2. Kaiser, A.D., and Hogness, D.S., J. Molec. Biol., **2**, 392 (1960).

CATALOG NUMBER

821222 M13MP 18 RF — 10 µg
M13mp18 and mp 19 RF DNA's are circular molecules of 7250 base pairs and contain polylinker regions of 54 base pairs. The parental bacteriophage, M13, is a filamentous, male-specific, *E.coli* phage in which the DNA molecule is single stranded and circular. Infected *E.coli* contain the double stranded, or replicative form (RF), DNA while the virions containing the (+) strand are secreted into the medium.
The polylinker regions contain recognition sites for 14 commonly used restriction enzymes, enabling cloning of a wide variety of restriction fragments. The 54 base pair polylinker region in M13mp 19 is in the reverse orientation to that in M13mp 18.
Both M13mp18 and 19 RF DNA's are supplied as an aqueous solution in 10 mM tris HCl, pH 8.0, 1 mM EDTA at a concentration of 0.5 µg/ul.
Also see M13mp19 RF

821223 M13MP19 RF — 10 µg
See description under M13mp18 RF

821224 pAT153 — 25 µg
pAT153 is a 3658 bp insertion vector isolated from *E.coli*. It contains ampicillin and tetracycline resistance genes. pAT153 is supplied as an aqueous solution in 10 mM tris HCl, pH 7.5, 1 mM EDTA at a concentration of 0.5 µg/µl.

821225 pBR322 — 25 µg
pBR322 is a 4363 bp vector purified from *E.coli*. It contains single restriction sites for Pst 1 and Pvu 1 within the ampicillin-resistance gene and single restriction sites for BamH I, Sal I, Sph I, EcoR V, Nru 1 and Xma III within the tetracycline-resistance gene. Supplied in 10 mM tris HCl, pH 7.5, 1 mM EDTA at a concentration of 0.5 µg/µl.

821226 pUC18 — 25 µg
pUC 18 and 19 are small vectors of approximately 2.7 Kb, and contain the Pvu II/EcoR I fragment of pBR322 and the lacZ gene multiple cloning site from M13mp18 (in pUC18) or mp19 (in pUC 19).
Both supplied in 10 mM tris HCl, pH 7.5, 1 mM EDTA at a concentration of 0.5 µg/µl.

821227 pUC19 — 25 µg
A small cloning vector of approx. 2.7 Kb. See pUC18 for more description.

OLIGONUCLEOTIDES

DNA Linkers (non-phosphorylated)

Linkers are end duplexes of oligodeoxyribonucleotides with terminal 5' and 3' -OH groups. Linkers can be used in molecular cloning protocols requiring the insertion of restriction sites into DNA. Each product is tested for purity and performance.

153383 0-5°C Aat II LINKER — 1 U
5′-d(GGACGTCC)-3′
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

153384 0-5°C Apa I LINKER — 1 U
d(GGGGCCCC)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

CATALOG NUMBER

153385 0-5°C ApaL I LINKER — 1 U
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

153386 0-5°C Avr II LINKER — 1 U
d(GCCTAGGC)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker

153387 0-5°C BamH I LINKER — 1 U
d(CGGATCCG)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker

153388 0-5°C BamH I LINKER — 1 U
d(CGGGATCCCG)
1u = 1 A_{260} unit . One A_{260} unit is approx. 40 µg of linker.

153389 0-5°C BamH I LINKER — 1 U
d(CGCGGATCCGCG)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

153390 0-5°C Bcl I LINKER — 1 U
d(CTGATCAG)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

153391 0-5°C Bgl II LINKER — 1 U
d(CAGATCTG)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

153392 0-5°C Bgl II LINKER — 1 U
d(GGAAGATCTTCC)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

153393 0-5°C Bgl II (*Mbo* II - *Mbo* II) LINKER — 1 U
d(GAAGATCTTC)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker

153394 0-5°C BspM II LINKER — 1 U
d(CTCCGGAG)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

153395 0-5°C BssH II LINKER — 1 U
d(CGCGCGCG)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

153396 0-5°C Cla I LINKER — 1 U
d(CATCGATG)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

153397 0-5°C Cla I LINKER — 1 U
d(CCATCGATGG)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

153398 0-5°C Cla I LINKER — 1 U
d(CCCATCGATGGG)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

CATALOG NUMBER		
153399 0-5°C	**Cla I LINKER** (substrate for *dam* methylase) d(GATCGATC) 1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.	1 U
153400 0-5°C	**Cla I - Mbo II** (requires complement) d(ATCGATCTTC) 1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.	1 U
153401 0-5°C	**Cla I - Mbo II** (requires complement) d(GAAGATCGAT) 1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.	1 U
153402 0-5°C	**Dde I/Dra III** d(CACT A/T AGTG) 1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.	1 U
153403 0-5°C	**EcoR I LINKER** d(GGATTCC) 1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.	1 U
153404 0-5°C	**EcoR I LINKER** d(CGGAATTCCG) 1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker	1 U
153405 0-5°C	**EcoR I LINKER** d(CCGGAATTCCGG) 1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.	1 U
153406 0-5°C	**EcoR I LINKER** (tailing) d(AATTCCGGAATT) 1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.	1 U
153407 0-5°C	**HinD III LINKER** d(CAAGCTTG) 1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker	1 U
153408 0-5°C	**HinD III LINKER** d(CCAAGCTTGG) 1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker	1 U
153409 0-5°C	**HinD III LINKER** d(CCCAAGCTTGGG) 1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker	1 U
153410 0-5°C	**Kpn I LINKER** d(GGGTACCC) 1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker	1 U
153411 0-5°C	**Mlu I LINKER** d(GACGCGTC) 1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker	1 U
153412 0-5°C	**Mlu I LINKER** d(CGACGCGTCG) 1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker	1 U
153413 0-5°C	**Nco I LINKER** d(CCCATGGG) 1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.	1 U
153414 0-5°C	**Nco I LINKER** (methionine codon) d(CATGCCATGGCATG) 1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.	1 U
153415 0-5°C	**Nde I LINKER** d(CCATATGG) 1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.	1 U
153416 0-5°C	**Nhe I LINKER** d(GGCTAGCC) 1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.	1 U
153417 0-5°C	**Nhe I LINKER** d(CGGCTAGCCG) 1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.	1 U
153418 0-5°C	**Nhe I LINKER** (nonsense codon) d(CTAGCTAGCTAG) 1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.	1 U
153419 0-5°C	**Not I LINKER** d(GCGGCCGC) 1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.	1 U
153420 0-5°C	**Not I LINKER** d(AGCGGCCGCT) 1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.	1 U
153421 0-5°C	**Not I LINKER** d(TTGCGGCCGCAA) 1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.	1 U
153422 0-5°C	**Nsi I LINKER** (cysteine codon) d(TGCATGCATGCA) 1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.	1 U
153423 0-5°C	**Pst I LINKER** d(GCTGCAGC) 1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.	1 U
153424 0-5°C	**Pst I LINKER** (cysteine codon) d(TGCACTGCAGTGCA) 1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.	1 U

Oligonucleotides

CATALOG NUMBER

153425 0-5°C **Pvu I LINKER** 1 U
d(CCGATCGG)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

153426 0-5°C **Pvu I (*Cla* I - *Cla* I)** 1 U
d(ATCGATCGAT)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

153427 0-5°C **Pvu I (*Nru* I - *Nru* I)** 1 U
d(TCGCGATCGCGA)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

153428 0-5°C **Pvu II LINKER** 1 U
d(CCAGCTGG)
1u = 1 A_{260}unit. One A_{260} unit is aprrox. 40 µg of linker.

153429 0-5°C **Sac I (*Sst* I) LINKER** 1 U
d(CGAGCTCG)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

153430 0-5°C **Sac II LINKER** 1 U
d(GCCGCGGC)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

153431 0-5°C **Sac II LINKER** 1 U
(beta-turn proline codon)
d(TCCCCGCGGGGA)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

153432 0-5°C **Sal I LINKER** 1 U
d(GGTCGACC)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

153433 0-5°C **Sal I LINKER** 1 U
d(CGGTCGACCG)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

153434 0-5°C **Sal I LINKER** 1 U
d(CCGGTCGACCGG)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

153435 0-5°C **Sca I LINKER** 1 U
(cationic lysine codon)
d(AAAAGTACTTTT)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

153436 0-5°C **Sfi I LINKER** 1 U
d(GGCCGC A/T GCGGCC)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

153437 0-5°C **Sma I LINKER** 1 U
d(CCCCGGGG)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

CATALOG NUMBER

153438 0-5°C **Sma I LINKER** 1 U
d(CCCCCGGGGG)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

153439 0-5°C **Sma I LINKER** 1 U
(beta-turn proline codon)
d(TCCCCCGGGGGA)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

153440 0-5°C **Spe I LINKER** 1 U
d(GACTAGTC)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

153441 0-5°C **Spe I LINKER** 1 U
d(GGACTAGTCC)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

153442 0-5°C **Spe I LINKER** 1 U
d(CGGACTAGTCCG)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

153443 0-5°C **Spe I LINKER** 1 U
(nonsense codon)
d(CTAGACTAGTCTAG)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

153444 0-5°C **Sph I LINKER** 1 U
d(GGCATGCC)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

153445 0-5°C **Sph I LINKER** 1 U
(methionine codon)
d(CATGCATGCATG)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

153446 0-5°C **Sph I LINKER** 1 U
(methionine or cysteine codon)
d(ACATGCATGCATGT)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

153447 0-5°C **Xba I LINKER** 1 U
d(CTCTAGAG)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

153448 0-5°C **Xba I LINKER** 1 U
d(GCTCTAGAGC)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

153449 0-5°C **Xba I LINKER** 1 U
d(TGCTCTAGAGCA)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

153450 0-5°C **Xba I LINKER** 1 U
(nonsense codon)
d(CTAGTCTAGACTAG)
1u = 1 A_{260} unit. One A_{260}unit is approx. 40 µg of linker.

CATALOG NUMBER

153451 0-5°C **Xho I LINKER** 1 U
d(CCTCGAGG)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

153452 0-5°C **Xho I LINKER** 1 U
d(CCCTCGAGGG)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

153453 0-5°C **Xho I LINKER** 1 U
d(CCGCTCGAGCGG)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

153454 0-5°C **Xma III LINKER** 1 U
d(CCGGCCGG)
1u = 1 A_{260} unit. One A_{260} unit is approx. 40 µg of linker.

DNA Primers

Primers are synthetic, single-stranded oligodeoxyribonucleotides used to prime (promote) DNA synthesis via DNA Polymerase and/or Reverse Transcriptase. Primers are also used in the generation of a hybridization probe for cloned sequences. Each product is tested for purity and performance.

153455 0-5°C **pBR322 *Bam*H I SITE, 20MER** 3 µg
(Clockwise)
5F128é...CACTATCGACTAC-GCGATCA...3′

153456 0-5°C **pBR322 *Eco*R I SITE, 16MER** 3 µg
(Clockwise)
5′...GTATCACGAGGCCCTT...3′

153457 0-5°C **pBR322 *Bam*H I SITE, 16MER** 3 µg
(Counter-clockwise)
5′...ATGCGTCCGGCGTAGA...3′

153458 0-5°C **pBR322 *Eco*R I SITE, 15MER** 3 µg
(Counter-clockwise)
5′...GATAAGCTGTCAAAC...3′

153459 0-5°C **pBR322 *Hind* III SITE, 15MER** 3 µg
(Clockwise)
5′...GACAGCTTATCATCG...3′

153460 0-5°C **pBR322 *Hind* III SITE, 16MER** 3 µg
(Counter-clockwise)
5′...GCAATTTAACTGTGAT...3′

153461 0-5°C **pBR322 *Pst* I SITE, 16MER** 3 µg
(Clockwise)
5′...GCTAGAGTAAGTAGTT...3′

153462 0-5°C **pBR322 *Pst* I SITE, 15MER** 3 µg
(Counter-clockwise)
5′...AACGACGAGCGTGAC...3′

153463 0-5°C **pBR322 *Sal* I, 15MER** 3 µg
(Clockwise)
5′...ATGCAGGAGTCGCAT...3′

153464 0-5°C **pBR322 *Sal* I, 15MER** 3 µg
(Counter-clockwise)
5′...AGTCATGCCCCGCGC...3′

CATALOG NUMBER

821335 **gt 11 FORWARD** 2 µg
5′-GACTCCTGGAGCCCG-3′
These primers are complementary to parts of the lacZ gene of gt 11 at either side of the Eco RI cloning site. Their use enables direct dideoxy sequencing of each end of the inserted DNA without further subcloning.

821336 **gt 11 REVERSE** 2 µg
gt 11 reverse
5′-GGTAGCGACCGGCGC-3′
These primers are complementary to parts of the lacZ gene of gt 11 at either side of the Eco RI cloning site. Their use enables direct dideoxy sequencing of each end of the inserted DNA without further subcloning.

HIV Primers
See: HIV Products Section

821228 **M13 15-MER** 2 µg
5′-TCCCAGTCACGACGT-3′.
This was the first M13 sequencing primer developed and it anneals to the (+) strand 37 bases upstream of the first restriction site in the multiple cloning site.

821229 **M13 SEQUENCING PRIMER (-20) 17-MER** 4 µg
5′-GTAAAACGACGGCCAGT-3′.
A universal primer with little complimentarity to other regions of the M13 DNA. It anneals close to the multiple cloning site. Since pUC vectors contain the same β-galactosidase gene as M13mp18/19, the same primer can be used to determine DNA sequences cloned into pUC vectors.

153465 0-5°C **M13 SEQUENCING PRIMER (-40) 17-MER** 4 µg
5′...GTTTTCCCAGTCACGAC...3′

153466 0-5°C **M13 HYBRIDIZATION PROBE PRIMER, 16-MER** 3 µg
5′...CACAATTCCACACAAC...3′

821230 **M13 PROBE PRIMER** 2 µg
5′-GAAATTGTTATCC-3′.
This primer is used
to generate hybridization probes from (+) strand M13 DNA carrying inserts.
The primer hybridizes downstream of the cloning site and during second strand synthesis in the presence of radioactive precursors, a partially double stranded molecule is generated which is single stranded in the region of the inserted DNA. This region of the inserted DNA can base pair with complementary sequences during hybridization reactions.

821231 **M13 REVERSE SEQUENCE PRIMER** 2 µg
5′-AACAGCTATGACCATG-3′
This reverse sequencing primer can be used to obtain sequence from the opposite end of the
insert in M13/pUC vectors to that obtained using the universal M13 primer.
It is not complementary to the (+) strand of M13 phage and therefore either double stranded sequencing must be performed or a partial second strand is generated using Klenow enzyme.

CATALOG NUMBER

821237 OLIGO (dC)-ECOR I — 2 µg
5′-TGAATTCGGATCCCC CCCCCCCCC-3′.
This oligonucleotide is used to prime the synthesis of a second strand when the first strand has been tailed with oligo d(G). After repair and if the first strand has been primed using the oligo d(T)-Eco RI.

821338 OLIGO (dG)-ECOR I — 2 µg
5′-GTGAATTCGTCGAC GGGGGGGGGG-3′.
This primer is an alternative to the oligo d(C)-Eco RI primer allowing tailing of the first strand with oligo d(C). Additionally, the Bam HI site is replaced by a Sal 1 site.

821339 OLIGO (dT)-ECOR I — 2 µg
5′-TGAATTCTTTTTTTTTTTTTTTT-3′.
This primer is used in place of oligo d(T) in the first strand synthesis reaction when making cDNA. On completion of the second strand an Eco RI site is present at the end of the molecule.
All oligonucleotides are supplied in aqueous solutions in 10 mM tris HCl, pH 8.0, 1 mM EDTA at a concentration of 1 µg/ml.

821232 SP6 PRIMER — 2 µg
5′-ACCTTATGTATCATACACAT-3′.
The SP6 primer hybridizes to part of the SP6 promoter found in many recently developed transcription vectors. It allows dideoxy sequencing of the transcribed insert DNA in such vectors.

153467 0-5°C SP6 PROMOTER PRIMER, 17-MER — 3 µg
5'...ATTTAGGTGACACTATA...3'

821233 T3 PRIMER — 2 µg
T3 primer is complementary to part of the T3 promoter and is used to sequence part of the insert DNA in transcription vectors containing the T3 promoter.

821234 T7 PRIMER — 2 µg
5′-CTCACTATAGGGAGACC-3′. This primer is complementary to conserved sequences present in T7 promoters and permits dideoxy sequencing of DNA in transcription vectors containing T7 promoters.

153468 0-5°C T7 PROMOTER PRIMER, 17-MER — 3 µg
5'...TAATACGACTCACTATA...3'

MOLECULAR BIOLOGY CELL CULTURE COMPONENTS

194021 RT AGAR, Bacteriological — 250 g, 1 kg
[9002-18-0]
Molecular Biology Reagent
Specially purified for use in preparing solid culture media for microbiological and bacteriological applications. Naturally occurring impurities have been reduced to a minimum.

194022 RT AGAR — 250 g, 1 kg
[9002-18-0]
Molecular Biology Reagent
Powder
Suitable as a component in culture media for molecular genetics.

CATALOG NUMBER

194023 RT D-(-)-ARABINOSE — 25 g, 100 g
[28697-53-2]
Molecular Biology Reagent
Purity: 99%
Suitable as a culture media component.
$C_5H_{10}O_5$ MW 150.1

194028 RT 2-DEOXY-D-GLUCOSE — 250 mg, 1 g, 5 g
[154-17-6]
White crystals
Purity: 99%
For use as a culture media component for molecular genetics.
$C_6H_{12}O_5$ MW 164.2

194024 RT D-(+)-GLUCOSE — 250 g, 1 kg
[50-99-7]
(Dextrose)
Molecular Biology Reagent
Ideal as a culture media component.
$C_6H_{12}O_6$ MW 180.2

193996 RT GLYCEROL — 100 ml, 500 ml, 1 liter
[56-81-5]
Molecular Biology Reagent
Purity: 99+%
Heavy metals (Pb): <5 ppm
No detectable DNase, RNase, or protease.
Prevents back-diffusion and protein samples into the buffer.
$C_3H_8O_3$ MW 92.09

194025 0-5°C HEMIN — 1 g, 5 g
[15489-47-1]
(Hemin Chloride)
Molecular Biology ReagentSource: Bovine
Ideal for use in culture media for molecular genetics.
$C_{34}H_{32}ClFeN_4O_4$ MW 652

102040 RT INDOLE-3-ACRYLIC ACID — 1 g, 5 g, 10 g
[1204-06-4]
Crystalline
Light yellow crystals.
A metabolite of tryptophan.
$C_{11}H_9NO_2$ MW 187.2

194029 0°C ISOPROPYL-β-D-THIOGALACTOPYRANOSIDE — 100 mg, 250 mg, 500 mg, 1 g, 5 g, 10 g
[367-93-1]
(Isopropyl-β-D-Thiogalactoside; IPTG)
Molecular Biology Reagent
Purity: >99%
Cell culture media component for use in molecular genetics.
β-Galactoside inducer.
$C_9H_{18}O_5S$ MW 238.3

194026 0°C β-NICOTINAMIDE ADENINE DINUCLEOTIDE — 500 mg, 1 g
[53-84-9]
(β-NAD)
Molecular Biology Reagent
Purity: ~99%
For use as a culture media component for molecular genetics. Chromatographically purified to remove trace inhibitors.
$C_{21}H_{27}N_7O_{14}P_2$ MW 663.4

CATALOG NUMBER

194030 0°C **o-NITROPHENYL-β-D-GALACTOPYRANOSIDE** — 250 mg, 500 mg, 1 g, 5 g, 25 g
[369-07-3]
(o-Nitrophenyl-β-D-galactoside)
Molecular Biology Reagent
Crystalline
Cell culture component for molecular genetics. Substrate for β-galactosidase
$C_{12}H_{15}NO_8$ MW 301.3

102477 0°C **o-NITROPHENYL-1-THIO-β-D-GALACTOPYRANOSIDE** — 25 mg, 100 mg, 250 mg
[1158-17-4]
Crystalline
$C_{12}H_{15}NO_7S$ MW 317.3

103303 0-5°C **YEAST EXTRACT POWDER** — 100 g, 500 g, 1 kg
A vacuum dried extract concentrate of Baker's yeast containing the B-complex factors of approximately three times its weight of ordinary dry yeast.

194027 0-5°C **YEAST EXTRACT** — 250 g, 1 kg
[8013-01-2]
Molecular Biology Reagent
A vacuum dried extract concentrate of Baker's yeast containing the B-complex factors of approximately three times its weight of ordinary dry yeast. An alternative to beef extract for general bacteriological use.

Antibiotics

194199 0-5°C **AMPICILLIN** — 20 mg, 50 mg
[69-52-3]
Sodium Salt
γ-Irradiated
Molecular Biology Reagent
Inhibits cell wall biosynthesis.
$C_{16}H_{18}N_3O_4SNa$ MW 371.4

194787 RT **CHLORAMPHENICOL** — 10 mg, 20 mg
[56-75-7]
(D(-)-threo-2,2-Dichloro-N-[β-hydroxy-α-(hydroxymethyl)-β-(4-nitro-phenyl)ethylacetamide)
γ-Irradiated
Molecular Biology Reagent
Inhibitor of translation on the 50S subunit at the peptidyltransferase step.
$C_{11}H_{12}Cl_2N_2O_5$ MW 323.1

194788 0°C **D-CYCLOSERINE** — 200 mg
[68-41-7]
(D-4-Amino-3-isoxazolidinone)
γ-Irradiated
Molecular Biology Reagent
Inhibits cell wall synthesis.
$C_3H_6N_2O_2$ MW 102.1

194789 0-5°C **GENTAMICIN SULFATE** — 15 mg
[1405-41-0]
(Gentamycin Sulfate)
γ-Irradiated
Molecular Biology Reagent
Inhibits protein synthesis.
Potency: Approx. 600 micrograms gentamicin/mg.

CATALOG NUMBER

194793 0°C **KANAMYCIN** — 25 mg, 50 mg
[70560-51-9]
From *Streptomyces kanamycetikus*
γ-Irradiated
Molecular Biology Reagent
Monosulfate Salt
Binds to the 70S subunit; inhibits translocation; elicits coding errors.
Activity: Approx. 735 µg/mg
Acts as an inhibitor of protein biosynthesis by producing a misreading of the 70s-ribosome.
$C_{18}H_{36}N_4O_{11} \bullet H_2SO_4$ MW 582.6

194794 0°C **NALIDIXIC ACID** — 15 mg
[3374-05-8]
(1-Ethyl-1,4-dihydro-7-methyl-4-oxo-1,8-naphthyridine-3-carboxylic acid)
Molecular Biology Reagent
γ-Irradiated
Sodium Salt
DNA synthesis inhibitor.
$C_{12}H_{11}N_2O_3Na$ MW 254.2

194795 0°C **RIFAMPIN** — 150 mg
[13294-46-1]
(Rifamycin AMP; Rifampicin)
γ-Irradiated
Molecular Biology Reagent
Specifically inhibits DNA-dependent bacterial RNA Polymerase. Mammalian RNA polymerase is not affected.
$C_{43}H_{58}N_4O_{12}$ MW 823

194796 0-5°C **SPECTINOMYCIN** — 100 mg
[1695-77-8]
(Actinospectacin, M141)
γ-Irradiated
Molecular Biology Reagent
Dihydrochloride
Inhibits protein synthesis through peptidyl tRNA translocation interference.
$C_{14}H_{24}N_2O_7 \bullet 2HCl$ MW 405.3

194797 0-5°C **STREPTOMYCIN** — 25 mg, 50 mg
[3810-74-0]
γ-Irradiated
Molecular Biology Reagent
Sulfate Salt
Inhibits initiation and causes misreading of rRNA inhibiting protein synthesis.
$C_{42}H_{84}N_{14}O_{36}S_3$ MW 1457.4

194798 0°C **TETRACYCLINE** — 10 mg, 20 mg
[64-75-5]
γ-Irradiated
Molecular Biology Reagent
Hydrochloride
Prevents protein synthesis by inhibiting aminoacyl-tRNA binding to ribosomes.
Purity: >98%
$C_{22}H_{24}N_2O_8 \bullet HCl$ MW 480.9

CATALOG NUMBER

Cell Regulation

194802 **-20°C** **BREFELDIN A** — 5 mg, 10 mg
[20350-15-6]
(γ,4-Dihydroxy-2-[6-hydroxy-1-heptenyl]-4-cyclopentanecrotonic acid λ-lactone; BFA)
Molecular Biology Reagent
Blocks binding of the cytosolic coat protein β-COP and ARF to Golgi membranes mediated by protein G. Also blocks protein transportation into post-Golgi compartments.
Ref.: Misumi, T., et al., J. Biol. Chem., **261**, 11398 (1986).
$C_{16}H_{24}O_4$ MW 280.4

194803 **0°C** **FORSKOLIN** — 10 mg, 25 mg
[66575-29-9]
From *Coleus forskohlii*
(7β-acetoxy-8,13-epoxy-1α,6β,9α-trihydroxy-labd-14-ene-11-one)
Molecular Biology Reagent
Functions as an antihypertensive and vasodilator. Adenylcyclase activator.
Ref.: Huang, R., et al., J. Cyclic Nucleotide Research, **8**, 385 (1982).
$C_{22}H_{34}O_7$ MW 410.5

194804 **0°C** **PHORBOL 12-MYRISTATE 13-ACETATE** — 1 mg, 10 mg, 25 mg
[16561-29-8]
(4α,9α,12β,13α,20-Pentahydroxytiglia-1,6-dien-3-one 12β-myristate 13-acetate; 12-O-Tetradecanoylphorbol 13 acetate; TPA)
Molecular Biology Reagent
Purity: ~99%
Activates T-Lymophocytes.
$C_{36}H_{56}O_8$ MW 616.8
POSSIBLE CARCINOGEN!

194805 **0-5°C** **STAUROSPORINE** — 100 µg, 500 µg, 1 mg
[62996-74-1]
(Antibiotic AM-2282)
From *Streptomyces sp.*
Molecular Biology Reagent
Purity: ≥98%
Inhibitor of phospolipid/Ca^{2+} dependent and cyclic nucleotide dependent protein kinases. A potent protein kinase C inhibitor and useful as a tool for studies on protein phosphorylation in the regulation of cellular functions.
$C_{28}H_{26}N_4O_3$ MW 466.5

MOLECULAR BIOLOGY KITS

DNA Purification

7410101 **0-5°C** **CLEANaprep™ DNA PURIFICATION KIT** — 25 Preps
The CLEANaprep™ Kit allows high yields of purified DNA from as little as 2 ml of *E. coli* culture, with yields as high as 20µg of purified plasmid DNA. The resulting DNA is suitable for sequencing or transformations.
CLEANaprep™ contains no harmful or toxic reagents and does not require the use of phenol or phenol/chloroform.
A complete protocol is supplied with each kit.

CATALOG NUMBER

7410102 **0-5°C** **CLEANaprep™ DNA PURIFICATION KIT** — 100 Preps
The CLEANaprep™ Kit allows high yields of purified DNA from as little as 2 ml of *E. coli* culture, with yields as high as 20µg of purified plasmid DNA. The resulting DNA is suitable for sequencing or transformations.
CLEANaprep™ contains no harmful or toxic reagents and does not require the use of phenol or phenol/chloroform.
A complete protocol is supplied with each kit.

7410103 **0-5°C** **CLEANaprep™ DNA PURIFICATION KIT** — 250 Preps
The CLEANaprep™ Kit allows high yields of purified DNA from as little as 2 ml of *E. coli* culture, with yields as high as 20µg of purified plasmid DNA. The resulting DNA is suitable for sequencing or transformations.
CLEANaprep™ contains no harmful or toxic reagents and does not require the use of phenol or phenol/chloroform.
A complete protocol is supplied with each kit.

DNA Labeling Kit

834010 **-20°C** **DNA LABELING KIT** — 1 kit
Version 1.1
For 10 Reactions
The ICN DNA Labeling Kit 1.1 is designed for labeling DNA to high specific activity. It is based on the random primer method developed by Feinberg and Vogelstein- random sequence primers are annealed to denatured template DNA, and complementary strands are synthesized with the Klenow Fragment in the presence of labeled dNTP's. The kit contents include:
- Klenow Fragment
- Hexanucleotide Primer in 5x Reaction Buffer
- Mix A- dGTP, dTTP, dCTP
- Mix C- dGTP, dATP, dTTP
- dNTP Solution- dGTP, dATP, dTTP, dCTP
- Control Template
- Deionized Water

834030 **-20°C** **DNA LABELING KIT** — 1 kit
Version 1.1
For 30 Reactions
The ICN DNA Labeling Kit 1.1 is designed for labeling DNA to high specific activity. It is based on the random primer method developed by Feinberg and Vogelstein- random sequence primers are annealed to denatured template DNA, and complementary strands are synthesized with the Klenow Fragment in the presence of labeled dNTP's. The kit contents include:
- Klenow Fragment
- Hexanucleotide Primer in 5x Reaction Buffer
- Mix A- dGTP, dTTP, dCTP
- Mix C- dGTP, dATP, dTTP
- dNTP Solution- dGTP, dATP, dTTP, dCTP
- Control Template
- Deionized Water

CATALOG NUMBER

878010 -20°C **DNA LABELING KIT** 1 kit
Version 1.2
For 10 Reactions
The ICN DNA Labeling Kit 1.2 is designed for labeling DNA to high specific activity. It is based on the random primer method developed by Feinberg and Vogelstein- random sequence primers are annealed to denatured template DNA, and complementary strands are synthesized with the Klenow Fragment in the presence of labeled dNTP's. This 1.2 version kit is ideal for diverse procedures in molecular biology, such as various kinds of hybridization analyses. One or two labeled dNTP's may be used with this kit as a precusor. The kit contents include:
- Klenow Fragment
- Hexanucleotide Primer in 5x Reaction Buffer
- Mix A- dGTP, dTTP, dCTP
- Mix C- dGTP, dATP, dTTP
- dATP Solution
- dCTP Solution
- dGTP Solution
- dTTP Solution
- dNTP Mix- dATP, dCTP, dGTP, and dTTP
- Control Template
- Deionized Water

878030 -20°C **DNA LABELING KIT** 1 kit
Version 1.2
For 30 Reactions
The ICN DNA Labeling Kit 1.2 is designed for labeling DNA to high specific activity. It is based on the random primer method developed by Feinberg and Vogelstein- random sequence primers are annealed to denatured template DNA, and complementary strands are synthesized with the Klenow Fragment in the presence of labeled dNTP's. This 1.2 version kit is ideal for diverse procedures in molecular biology, such as various kinds of hybridization analyses. One or two labeled dNTP's may be used with this kit as a precusor. The kit contents include:
- Klenow Fragment
- Hexanucleotide Primer in 5x Reaction Buffer
- Mix A- dGTP, dTTP, dCTP
- Mix C- dGTP, dATP, dTTP
- dATP Solution
- dCTP Solution
- dGTP Solution
- dTTP Solution
- dNTP Mix- dATP, dCTP, dGTP, and dTTP
- Control Template
- Deionized Water

CATALOG NUMBER

845010 -20°C **DNA LABELING KIT** 1 kit
Version 2.0
For 10 Reactions
The ICN DNA Labeling Kit 2.0 is designed for rapid and convenient synthesis of labeled DNA probes with high specific activity (>1 x 10^9 dpm/μg DNA). Klenow fragment synthesizes the complementary DNA strand from the 3′-ends of random decanucleotides in the presence of dNTP's. Any radioactive or nonradioactive labeled dNTP analogs may be used with this kit. The kit contents include:
- Klenow Fragment
- Decanucleotide Primer in 5x Reaction Buffer
- Mix A- dGTP, dTTP, dCTP
- Mix C- dGTP, dATP, dTTP
- dNTP Solution- dGTP, dATP, dTTP, dCTP
- Control Template
- Deionized Water

845030 -20°C **DNA LABELING KIT** 1 kit
Version 2.0
For 30 Reactions
The ICN DNA Labeling Kit 2.0 is designed for rapid and convenient synthesis of labeled DNA probes with high specific activity (>1 x 10^9 dpm/μg DNA). Klenow fragment synthesizes the complementary DNA strand from the 3′-ends of random decanucleotides in the presence of dNTP's. Any radioactive or nonradioactive labeled dNTP analogs may be used with this kit. The kit contents include:
- Klenow Fragment
- Decanucleotide Primer in 5x Reaction Buffer
- Mix A- dGTP, dTTP, dCTP
- Mix C- dGTP, dATP, dTTP
- dNTP Solution- dGTP, dATP, dTTP, dCTP
- Control Template
- Deionized Water

856010 -20°C **DNA 5′-END LABELING KIT** 10 assays
For 10 Reactions
The ICN DNA 5′-End Labeling Kit is a complete system for simple and rapid labeling of both DNA fragments and synthetic nucleotides. T4 polynucleotide kinase catalyzes the transfer of the γ-phosphate of [γ-^{32}P]-ATP to the 5′-end of DNA or oligonucleotide. DNA fragments may be kinased with a radioactive phosphate by exchange reaction or may be dephosphorylated with alkaline phosphatase and end-labeled by direct reaction. The kit features optimized buffers for labeling 5′-protruding, blunt and 3′-protruding DNA ends. The kit allows for up 10^6-10^7 dpm/pmol labeled ends of DNA with ^{32}P. The kit contents includes: T4 Polynucleotide Kinase
- Calf Intestine Alkaline Phosphatase (CIAP)
- Buffer A
- Buffer B
- Buffer D
- Control DNA
- PEG 6000 Solution
- EDTA Solution
- Deionized Water

CATALOG NUMBER

856030 -20°C **DNA 5′-END LABELING KIT** 30/kit
For 30 Reactions
The ICN DNA 5′-End Labeling Kit is a complete system for simple and rapid labeling of both DNA fragments and synthetic nucleotides. T4 polynucleotide kinase catalyzes the transfer of the γ-phosphate of [γ-^{32}P]-ATP to the 5′-end of DNA or oligonucleotide. DNA fragments may be kinased with a radioactive phosphate by exchange reaction or may be dephosphorylated with alkaline phosphatase and end-labeled by direct reaction. The kit features optimized buffers for labeling 5′-protruding, blunt and 3′-protruding DNA ends. The kit allows for up 10^6-10^7 dpm/pmol labeled ends of DNA with ^{32}P. The kit contents includes: T4 Polynucleotide Kinase
- Calf Intestine Alkaline Phosphatase (CIAP)
- Buffer A
- Buffer B
- Buffer D
- Control DNA
- PEG 6000 Solution
- EDTA Solution
- Deionized Water

867010 -20°C **SYNTHETIC OLIGONUCLEOTIDE 5′-END LABELING KIT** 1 kit
For 10 Reactions
The ICN Synthetic Oligonucleotide 5′-End Labeling Kit is a complete system for the labeling or phosphorylation of 5′-ends of synthetic nucleotides. T4 polynucleotide kinase catalyzes the transfer of the γ-phosphate of ATP to the 5′-OH end of the oligonucleotide or DNA. Synthetic Oligonucleotides may be kinased with a radioactive phosphate and used as a labeled probe or may be phosphorylated with the nonradioactive ATP provided with the kit. A synthetic control 14-mer is also in the kit. The kit contents includes: T4 Polynucleotide Kinase
- 10X Kinase Buffer
- ATP Solution
- Conrol Oligonucleotide
- Deionized Water

867030 -20°C **SYNTHETIC OLIGONUCLEOTIDE 5′-END LABELING KIT** 1 kit
For 30 Reactions
The ICN Synthetic Oligonucleotide 5′-End Labeling Kit is a complete system for the labeling or phosphorylation of 5′-ends of synthetic nucleotides. T4 polynucleotide kinase catalyzes the transfer of the γ-phosphate of ATP to the 5′-OH end of the oligonucleotide or DNA. Synthetic Oligonucleotides may be kinased with a radioactive phosphate and used as a labeled probe or may be phosphorylated with the nonradioactive ATP provided with the kit. A synthetic control 14-mer is also in the kit. The kit contents includes: T4 Polynucleotide Kinase
- 10X Kinase Buffer
- ATP Solution
- Conrol Oligonucleotide
- Deionized Water

CATALOG NUMBER

Chemiluminescent Reporter Gene Assays

3131000 0-5°C **AURORA™ AP CHEMILUMINESCENT REPORTER GENE ASSAY** 200/kit
Chemiluminescent Reporter Gene Assay for Secreted Alkaline Phosphatase
Kit Size: 200 assays or 600 assays
Contents:
- Phospha-Light™ 5X Dilution Buffer
- Phospha-Light™ Reaction Buffer Diluent
- Phospha-Light™ Assay Buffer
- Starlight™ Chemiluminescent Substrate
- PAP Positive Control
- Protocol Booklet

3132000 0-5°C **AURORA™ AP CHEMILUMINESCENT REPORTER GENE ASSAY** 600/kit
Chemiluminescent Reporter Gene Assay for Secreted Alkaline Phosphatase
Kit Size: 200 assays or 600 assays
Contents:
- Phospha-Light™ 5X Dilution Buffer
- Phospha-Light™ Reaction Buffer Diluent
- Phospha-Light™ Assay Buffer
- Starlight™ Chemiluminescent Substrate
- PAP Positive Control
- Protocol Booklet

3121000 0-5°C **AURORA™ GAL-XE CHEMILUMINESCENT REPORTER GENE ASSAY** 200/kit
Chemiluminescent Reporter Gene Assay for β-Galactosidase
Kit Sizes: 200 assays or 600 assays.
Contents:
- Lysis Solution
- Galacto-Reaction Buffer Diluent
- Light Emission Accelerator
- Galacton™ Chemiluminescent Substrate

3122000 0-5°C **AURORA™ GAL-XE CHEMILUMINESCENT REPORTER GENE ASSAY** 600/kit
Chemiluminescent Reporter Gene Assay for β-Galactosidase
Kit Sizes: 200 assays or 600 assays.
Contents:
- Lysis Solution
- Galacto-Reaction Buffer Diluent
- Light Emission Accelerator
- Galacton™ Chemiluminescent Substrate

3141000 0-5°C **AURORA™ GUS CHEMILUMINESCENT REPORTER GENE ASSAY** 200/kit
For Plant Cells
Chemiluminescent Gene Reporter Assay for β-Glucuronidase
Kit Size: 200 assays or 600 assays
Contents:
- Gus-Reaction Buffer Diluent
- Lysis Solution
- Light Emission Accelerator
- Glucuron™ Chemiluminescent Substrate
- Protocol Booklet

CATALOG NUMBER

3142000 0-5°C — **AURORA™ GUS CHEMILUMINESCENT REPORTER GENE ASSAY** — 600/kit
For Plant Cells
Chemiluminescent Gene Reporter Assay for β-Glucuronidase
Kit Size: 200 assays or 600 assays
Contents:
- Gus-Reaction Buffer Diluent
- Lysis Solution
- Light Emission Accelerator
- Glucuron™ Chemiluminescent Substrate
- Protocol Booklet

3143000 0-5°C — **AURORA™ GUS CHEMILUMINESCENT REPORTER GENE ASSAY** — 200/kit
For Mammalian Cells
Chemiluminescent Gene Reporter Assay for β-Glucuronidase
Kit Size: 200 assays or 600 assays
Contents:
- Gus-Reaction Buffer Diluent
- Lysis Solution
- Light Emission Accelerator
- Glucuron™ Chemiluminescent Substrate
- Protocol Booklet

3144000 0-5°C — **AURORA™ GUS CHEMILUMINESCENT REPORTER GENE ASSAY** — 600/kit
For Mammalian Cells
Chemiluminescent Gene Reporter Assay for β-Glucuronidase
Kit Size: 200 assays or 600 assays
Contents:
- Gus-Reaction Buffer Diluent
- Lysis Solution
- Light Emission Accelerator
- Glucuron™ Chemiluminescent Substrate
- Protocol Booklet

ADDITIONAL REAGENTS

105456 0°C — **3′-O-ACETYL-2′-DEOXYADENOSINE** — 1 mg, 5 mg, 25 mg, 100 mg
[6612-73-3]
Crystalline
For the preparation of 5′-derivatives of 2′-deoxyadenosine.
$C_{12}H_{15}N_5O_4$ MW 293.3

105457 0°C — **3′-O-ACETYL-2′-DEOXYCYTIDINE** — 1 mg, 5 mg, 25 mg, 100 mg
[72560-69-1]
Crystalline
For the preparation of 5′-derivatives of 2′-deoxycytidine.
$C_{11}H_{15}N_3O_5$ MW 269.3

105458 0°C — **3′-O-ACETYL-2′-DEOXYGUANOSINE** — 1 mg, 5 mg, 25 mg, 100 mg
For the preparation of 5′- derivatives of 2′-deoxyguanosine

100041 0-5°C — **3′-O-ACETYLTHYMIDINE** — 100 mg, 500 mg, 1 g
[21090-30-2]
Purity: Approx. 99%
$C_{12}H_{16}N_2O_6$ MW 284.3

CATALOG NUMBER

150254 RT — **ACRIDINE ORANGE BASE** — 5 g, 25 g, 100 g
[494-38-2]
(3,6-bis(Dimethylamino)acridine)
C.I. 46005
Fluorescent stain for proteins.
RNA Polymerase inhibitor
Dye content approx. 78%
Nature, **187**, 964 (1960).
$C_{17}H_{19}N_3$ MW 265.4

194120 0-5°C — **ALBUMIN, BOVINE** — 25 mg, 100 mg, 250 mg
[9048-46-8]
Nuclease-Free
Purity: ≥90%
Contains no detectable exonuclease, endonuclease, ribonuclease, or protease activity. Some degradation products may exist.
Supplied as an aqueous solution in 50% glycerol at a concentration of 50 mg/ml at neutral pH.

100651 RT — **AMMONIUM ACETATE** — 250 g, 500 g, 2 kg, 5 kg
[631-61-8]
Crystalline
Purity: ~99%
$NH_4C_2H_3O_2$ MW 77.1

194000 RT — **AMMONIUM ACETATE** — 100 g, 250 g, 500 g
[631-61-8]
Purity: ~98%
Molecular Biology Reagent
$NH_4C_2H_3O_2$ MW 77.1

198759 0-5°C — **AMMONIUM ACETATE** — 100 ml, 1 liter
[631-61-8]
Purity: ~98%
7.5M Solution
Prepared in 18 megohm water and 0.2 μm filtered.
Ref.: Sambrook, J., et al., Molecular Cloning: A Laboratory Manual, CSHL (1989), p. B.10.

194806 RT — **AMMONIUM CHLORIDE** — 100 g, 500 g, 1 kg
[12125-02-9]
Purity: ~98%
Molecular Biology Reagent
NH_4Cl MW 53.5

194807 — **AMMONIUM SULFATE** — 100 g, 500 g, 1 kg, 5 kg
[7783-20-2]
Molecular Biology Reagent
Fe: <5 ppm
Mg: <5 ppm
Pb: <2 ppm
Mn: <1 ppm
Ca: <5 ppm
Zn: <5 ppm
Cu: <2 ppm
Useful in the isolation and purification of enzymes and proteins.
$(NH_4)_2SO_4$ MW 132.1

150445 0°C — **N^6-BENZOYL-2′-DEOXYADENOSINE** — 25 mg, 100 mg, 250 mg, 1 g
[4546-72-9]
(dA-N-Bz)
Crystalline
Intermediate for oligonucleotide synthesis.
$C_{17}H_{17}N_5O_4$ MW 355.4

CATALOG NUMBER

150446 0°C — **N^4-BENZOYL-2′-DEOXYCYTIDINE** — 25 mg, 100 mg, 250 mg, 1 g
[4836-13-9]
(dC-N-Bz)
Crystalline
Intermediate for oligonucleotide synthesis.
$C_{16}H_{17}N_3O_5$ MW 331.3

194808 RT — **BES** — 25 g, 100 g, 500 g
[10191-18-1]
(N,N-bis(2-Hydroxyethyl)-2-aminoethanesulfonic acid)
Free Acid
Molecular Biology Reagent
Purity: 99+%
Zwitterionic buffer, pKa = 7.1 at 25°C; useful pH range 6.4-7.8.
$C_6H_{15}NO_5S$ MW 213.2

194809 RT — **BIS-TRIS PROPANE** — 25 g, 100 g, 500 g
[64431-96-5]
(1,3-bis[tris(Hydroxymethyl)methyl-amino]-propane)
Molecular Biology Reagent
Purity: ≥99%
pKa_1=6.8, pKa_2 = 9.0 at 25°C.
Useful pH range 6.3-9.5.
$C_{11}H_{26}N_2O_6$ MW 282.3

194810 RT — **BORIC ACID** — 500 g, 1 kg, 5 kg, 10 kg
[10043-35-3]
Molecular Biology Reagent
Purity: ~99%
Mg ≤5 ppm
Fe ≤5 ppm
Pb ≤20 ppm
H_3BO_3 MW 61.83

194802 -20°C — **BREFELDIN A** — 5 mg, 10 mg
[20350-15-6]
(γ,4-Dihydroxy-2-[6-hydroxy-1-heptenyl]-4-cyclopentanecrotonic acid λ-lactone; BFA)
Molecular Biology Reagent
Blocks binding of the cytosolic coat protein β-COP and ARF to Golgi membranes mediated by protein G. Also blocks protein transportation into post-Golgi compartments.
Ref.: Misumi, T., et al., J. Biol. Chem., **261**, 11398 (1986).
$C_{16}H_{24}O_4$ MW 280.4

194840 RT — **BRIJ 35** — 100 g, 250 g
[9002-92-0]
(Polyoxyethylene 23 Lauryl Ether)
Molecular Biology Reagent
For use in Stein-Moore Chromatography and all molecular biology applications.
Ref.: Stein, W.H. and Moore, S.J., J. Biol. Chem., **211**, 893 (1954).

194811 0°C — **5-BROMO-4-CHLORO-3-INDOLYL-β-D-GALACTOPYRANOSIDE** — 10 mg, 100 mg, 500 mg
[7240-90-6]
(X-Gal; 5-Bromo-4-chloro-3-indolyl-β-D-galactoside)
Molecular Biology Reagent
Purity: ≥98%
Used as indigogenic substrate for β-galactosidase, for detection of β-galactosidase-positive clones, and the identification of lac and bacterial colonies or phage plaques.
$C_{14}H_{15}BrClNO_6$ MW 408.6

CATALOG NUMBER

194812 -20°C — **5-BROMO-4-CHLORO-3-INDOLYL-β-D-GLUCURONIDE** — 10 mg, 25 mg, 100 mg
[18656-96-7]
(X-GlcA; X-Glucuro)
Molecular Biology Reagent
Cyclohexylammonium Salt
Purity: ≥98%
A β-glucuronidase substrate which forms an intense blue precipitate upon enzymatic action. Used for the detection of the GUS gene in bacterial colonies and in histochemical applications.
Protect from light and humidity.
$C_{14}H_{13}BrClNO_7 \bullet C_6H_{13}N$ MW 521.8

194813 -20°C — **5-BROMO-4-CHLORO-3-INDOLYL-β-D-GLUCURONIDE** — 10 mg, 25 mg, 100 mg, 500 mg
[129541-41-9]
(X-GlcA; X-Glucuro)
Molecular Biology Reagent
Sodium Salt
Purity: ≥98%
A β-glucuronidase substrate which forms an intense blue precipitate upon enzymatic action. Used for the detection of the GUS gene in bacterial colonies and in histochemical applications.
Protect from light and humidity.
$C_{14}H_{13}BrClNO_7Na$ MW 444.6

194814 -20°C — **5-BROMO-3-INDOLYL-β-D-GALACTOPYRANOSIDE** — 10 mg, 100 mg, 500 mg
[97753-82-7]
(Bluo-GAL)
Molecular Biology Grade
Purity: ≥98%
An α-galactosidase substrate which is converted to an insoluble indigo-blue chromophore darker than that released by X-GAL. It is ideal for Lac gene detection systems in immunoblotting, immunocytochemical, and histological applications.
Protect from light and humidity.
$C_{14}H_{16}BrNO_6$ MW 374.2

193989 0°C — **5-BROMO-4-CHLORO-3-INDOLYL PHOSPHATE** — 25 mg, 100 mg, 500 mg
[102185-33-1]
Molecular Biology Reagent
Disodium Salt
Purity: >98%
Chromogenic substrate for alkaline phosphatase in ELISA.
$C_8H_4BrClNO_4PNa_2$ MW 370.4

193991 RT — **5-BROMO-4-CHLORO-3-INDOLYL PHOSPHATE** — 25 mg, 100 mg, 500 mg
[6578-06-9]
Molecular Biology Reagent
p-Toluidine Salt
Purity: ≥98%
A chromogenic substrate for alkaline phosphatase in ELISA.
$C_8H_6BrClNO_4P \bullet C_7H_9N$ MW 433.6

193990 RT — **BROMOPHENOL BLUE** — 5 g, 10 g, 25 g
[62625-28-9]
Molecular Biology Reagent
Sodium Salt
Ideal tracking dye for nucleic acid gel electrophoresis.
$C_{19}H_9Br_4O_5SNa$ MW 692.0

CATALOG NUMBER

194001 RT **n-BUTANOL** — 25 ml, 100 ml, 500 ml
[71-36-3]
(1-Butanol; Butyl Alcohol)
Molecular Biology Reagent
Purity: 99+%
Useful for ethidium bromide removal from DNA purified by CsCl gradient ultracentrifugation. It may also be used in the concentrationof dilute nucleic acid solutions by repeated extractions. Improved recovery by ethanol precipitation results from increased nucleic acid concentration.
$C_4H_{10}O$ MW 74.12

194787 RT **CHLORAMPHENICOL** — 10 mg, 20 mg
[56-75-7]
(D(-)-threo-2,2-Dichloro-N-[β-hydroxy-α-(hydroxymethyl)-β-(4-nitro-phenyl)ethylacetamide)
γ-Irradiated
Molecular Biology Reagent
Inhibitor of translation on the 50S subunit at the peptidyltransferase step.
$C_{11}H_{12}Cl_2N_2O_5$ MW 323.1

150589 RT **CESIUM CHLORIDE** — 5 g, 25 g, 100 g, 500 g, 1 kg
ULTRA PURE
[7647-17-8]
Ultra Pure
Purity: 99.999%
A_{260} of 50% solution < 0.02
Solutions are clear and colorless. Especially suited for critical density gradient techniques.
CsCl MW 168.4

101321 RT **CESIUM CHLORIDE** — 25 g, 100 g, 250 g, 500 g, 1 kg
[7647-17-8]
Reagent Grade
Purity: 99.0%
Solubility: Clear, colorless (50% aqueous solution)
pH: 5.5-6.5 (1% aqueous solution)
CsCl MW 168.4

194815 RT **CALCIUM CHLORIDE** — 100 g, 250 g, 500 g
[10035-04-8]
Molecular Biology Reagent
Purity: ~99%
Dihydrate
Ref.: Sambrook, J., et al., "Molecular Cloning: A Laboratory Manual", Cold Spring Harbor Laboratory, pp. 1.82-1.84 (1989).
$CaCl_2 \bullet 2H_2O$ MW 147

194816 -20°C **6-CHLORO-3-INDOLYL-β-D-GLUCURONIDE** — 5 mg, 25 mg
[138182-20-4]
(Salmon-Glucuro; Salmon-β-D-GlcA)
Molecular Biology Reagent
Purity: ≥98%
Cyclohexylammonium Salt
A β-glucuronidase chromogenic substrate which produces an insoluble pink color in GUS^+ bacterial colonies. It serves as an alternative to X-glucuronide for β-glucuronidase detection.
Protect From Light and Humidity.
$C_{14}H_{14}ClNO_7 \bullet C_6H_{13}N$ MW 442.9

CATALOG NUMBER

194800 RT **CHLOROFORM** — 1 vial, 5 vials
[67-66-3]
Molecular Biology Reagent
Purity: 99+%
Used for PCR aqueous phase recovery overlaid with mineral oil.
Each vial contains 1.5 ml.
$CHCl_3$ MW 119.4

194002 RT **CHLOROFORM** — 25 ml, 100 ml, 500 ml
[67-66-3]
Molecular Biology Reagent
Purity: 99+%
For nucleic acid purification. Improves extraction of crude DNA when used with phenol.
$CHCl_3$ MW 119.4

150648 0-5°C **4-CHLOROPHENYL PHOSPHORODICHLORIDATE** — 1 ml, 5 ml, 25 ml
[772-79-2]
(4-Chlorophenyl dichlorophosphate)
Phosphorylating reagent for oligonucleotide synthesis.
1 ml = approx. 1.51 gm
Ref.: Chem. Lett. 197 (1981).
$C_6H_4Cl_3O_2P$ MW 245.4

194817 RT **CITRIC ACID** — 100 g, 500 g, 1 kg, 5 kg, 10 kg
[68-04-2]
(Sodium citrate)
Molecular Biology Reagent
Purity: ~99%
Trisodium Salt
Dihydrate
$C_6H_5O_7Na_3 \bullet 2H_2O$ MW 294.1

150923 0°C **5′-DIMETHOXYTRITYL-N^6-BENZOYL-2′-DEOXYADENOSINE** — 100 mg, 250 mg, 1 g, 5 g
[64325-78-6]
(5′-DMT-N-Bz-dA)
$C_{38}H_{35}N_5O_6$ MW 657.7

150924 0°C **5′-DIMETHOXYTRITYL-N^4-BENZOYL-2′-DEOXYCYTIDINE** — 100 mg, 250 mg, 1 g, 5 g
[67219-55-0]
(5′-DMT-N-Bz-dC)
$C_{37}H_{35}N_3O_7$ MW 633.7

150926 0°C **5′-DIMETHOXYTRITYL-N^2-ISOBUTYRYL-2′-DEOXYGUANOSINE** — 100 mg, 250 mg, 1 g, 5 g
[68892-41-1]
(5′-DMT-N-iBu-dG)
$C_{35}H_{37}N_5O_7$ MW 639.7

150927 0°C **5′-DIMETHOXYTRITYL THYMIDINE** — 100 mg, 250 mg, 1 g, 5 g
[40615-39-2]
(5′-DMT-T)
$C_{31}H_{32}N_2O_7$ MW 544.6

194818 RT **N,N-DIMETHYLFORMAMIDE** — 5 ml, 250 ml, 500 ml
[68-12-2]
(DMF)
Molecular Biology Reagent
Purity: 99+%
A solvent for chromogenic substrates in molecular biology experiments.
C_3H_7NO MW 73.09

CATALOG NUMBER

194819 RT **DIMETHYL SULFOXIDE** — 50 ml, 100 ml, 250 ml
[67-68-5]
(DMSO)
Molecular Biology Reagent
Purity: ≥99%
Meets ACS specifications.
C_2H_6SO MW 78.13

194820 0-5°C **DITHIOERYTHRITOL** — 250 mg, 1 g, 5 g, 10 g, 25 g, 50 g
[6892-68-8]
(DTE; Cleland's Reagent)
Molecular Biology Reagent
Purity: 99+%
Ideal for molecular biology applications.
$C_4H_{10}O_2S_2$ MW 154.2

194821 0-5°C **DL-DITHIOTHREITOL** — 250 mg, 1 g, 5 g, 10 g, 25 g, 50 g
[27565-41-9]
(DTT)
Molecular Biology Reagent
Purity: >99%
$C_4H_{10}O_2S_2$ MW 154.2

816203 **DNA/RNA RUNNING BUFFER** — 1 box
20 mM Tris HCl
0.2 mM EDTA
5 mM NaCl
Empty contents of 1 packet into a 4-liter flask and add deionized water. Four liters of pH 8.0 buffer is now ready to use. This is a commonly used buffer for DNA and RNA electrophoresis.
(1 box contains 12 packets).

194822 RT **ETHYLENEDIAMINETETRAACETIC ACID** — 50 g, 100 g, 250 g, 500 g, 1 kg, 5 kg
[6381-92-6]
(EDTA)
Molecular Biology Reagent
Purity: 99+%
Disodium Salt
Dihydrate
Ideal for most molecular biology applications.
$C_{10}H_{14}N_2O_8Na_2 \bullet 2H_2O$ MW 372.2

2820349 **ETHYLENEDIAMINETETRAACETIC ACID** — 100 ml
(EDTA; Versene)
0.02% (w/v) solution
In Normal Saline
Storage temperature: 15-30°C

194823 RT **ETHYLENE GLYCOL-*bis*-[β-AMINO-ETHYLETHER)-N,N,N′,N′-TETRAACETIC ACID** — 10 g, 25 g, 100 g, 500 g
[67-42-5]
(EGTA)
Molecular Biology Reagent
Purity: ≥97%
$C_{14}H_{24}N_2O_{10}$ MW 380.4

193993 RT **ETHIDIUM BROMIDE** — 250 mg, 1 g, 5 g, 25 g
[1239-45-8]
(2,7-Diamino-10-ethyl-9-phenylphenanthridinium bromide; Homidium bromide)
Molecular Biology Reagent
Purity: 98%
Ideal for fluorometric detection of double stranded nucleic acids in gel electrophoresis. Also acts as an RNA polymerase inhibitor, and in separation of high molecular weight DNA's.
$C_{21}H_{20}N_3Br$ MW 394.3

CATALOG NUMBER

194824 RT **FICOLL®** — 5 g, 10 g, 25 g, 100 g, 500 g
[26873-85-8]
Molecular Biology Reagent
Dialyzed
Approx. Mol. Wt. 400,000
A copolymer of sucrose and epichlorohydrin.
Component used to make density gradients for lymphocyte separation.
Ficoll® is a registered trademark of Pharmacia, Inc.

802511 RT **ETHIDIUM BROMIDE SOLUTION** — 10 ml
[1239-45-8]
A 10mg/ml easy-to-use solution of ethidium bromide in specially filtered, deionized water.
• Excellent for nucleic acid electrophoresis and purification applications.
• Eliminates the dust hazard associated with powdered ethidium bromide
•Saves time spent on weighing and mixing.
$C_{21}H_{20}BrN_3$ MW 394.3

194047 RT **FORMALDEHYDE, ACS** — 100 ml, 500 ml
[50-00-0]
Formalin
ACS Reagent Grade
37% Solution
Purity: 36.5-38%
Contains 10-15% methanol.
CH_2O MW 30.03

193995 RT **FORMAMIDE** — 100 g, 250 g, 500 g, 1 kg
[75-12-7]
Molecular Biology Reagent
Purity: ≥99.5%
Ideal for sequencing, denaturing polyacrylamide gels, and nucleic acid hybridization.
CH_3NO MW 45.0

194803 0°C **FORSKOLIN** — 10 mg, 25 mg
[66575-29-9]
From *Coleus forskohlii*
(7β-acetoxy-8,13-epoxy-1α,6β,9α-trihydroxy-labd-14-ene-11-one)
Molecular Biology Reagent
Functions as an antihypertensive and vasodilator. Adenylcyclase activator.
Ref.: Huang, R., et al., J. Cyclic Nucleotide Research, **8**, 385 (1982).
$C_{22}H_{34}O_7$ MW 410.5

193996 RT **GLYCEROL** — 100 ml, 500 ml, 1 liter
[56-81-5]
Molecular Biology Reagent
Purity: 99+%
Heavy metals (Pb): <5 ppm
No detectable DNase, RNase, or protease.
Prevents back-diffusion and protein samples into the buffer.
$C_3H_8O_3$ MW 92.09

CATALOG NUMBER

194825 GLYCINE — 100 g, 500 g, 1 kg, 5 kg
[56-40-6]
Molecular Biology Reagent
Purity: 99+%
Ideal for all molecular biology applications and buffer preparations.
$C_2H_5NO_2$ MW 75.07

194826 RT GUANIDINE HYDROCHLORIDE — 25 g, 100 g, 500 g, 1 kg, 3 kg
[50-01-1]
Molecular Biology Reagent
Purity: 99+%
$CH_5N_3 \bullet HCl$ MW 95.53

194003 RT GUANIDINE THIOCYANATE — 100 g, 250 g, 500 g
[593-84-0]
Molecular Biology Reagent
Purity: ≥99%
Strong protein denaturant which inactivates nucleases approximately 2.5 times faster than guanidine hydrochloride.
$CH_5N_3 \bullet HSCN$ MW 118.2

194827 RT HEPES — 25 g, 100 g, 500 g
[7365-45-9]
(N-2-Hydroxyethylpiperazine-N′-2-ethanesulfonic acid)
Molecular Biology Reagent
Purity: 99+%
Free Acid
Zwitterionic Buffer useful in the pH range 6.8-8.2.
pKa = 7.55 at 25°C
$C_8H_{18}N_2O_4S$ MW 238.3

194828 RT HEPES — 25 g, 100 g, 500 g
[75277-39-3]
Molecular Biology Reagent
Purity: 99+%
Sodium Salt
pKa = 7.55 at 25°C
$C_8H_{17}N_2O_4SNa$ MW 260.3

194054 RT HYDROCHLORIC ACID, ACS — 100 ml, 500 ml
[7647-01-0]
ACS Reagent Grade
Purity: 36.5-38%
HCl MW 36.5

198596 RT IGEPAL® CA-630 — 50 ml, 100 ml, 500 ml
[9002-93-1]
Non-Ionic Detergent
This product is chemically equivalent to Nonidet P-40. Nonidet is no longer commercially available.

194829 RT IMIDAZOLE — 5 g, 25 g, 100 g
[288-32-4]
Molecular Biology Reagent
Purity: 99+%
Histamine Antagonist.
Useful pH range: 6.2-7.8
$C_3H_4N_2$ MW 68.1

151356 0-5°C N^2-ISOBUTYRYL-2′-DEOXYGUANOSINE — 25 mg, 100 mg, 250 mg, 1 g
[68892-42-2]
(dG-N-iBu)

151357 0-5°C N^2-ISOBUTYRYL-2′-DEOXYGUANOSINE-3′-(4-CHLOROPHENYL-2-CYANO-ETHYL)PHOSPHATE — 25 mg, 100 mg, 500 mg
[HO-N-iBu-dG-PO-(Cl-Ph)(CNEt)]

194008 RT N-LAUROYLSARCOSINE — 50 g, 100 g, 250 g
[7631-98-3]
Molecular Biology Reagent
Sodium Salt
Purity: ≥97%
Useful in concentrated salt solutions used in the cell lysis step during RNA purification.
$C_{15}H_{28}NO_3Na$ MW 293.4

194010 RT LITHIUM CHLORIDE — 100 g, 500 g
[7447-41-8]
Molecular Biology Reagent
Purity: ≥99%
LiCl MW 42.4

194830 LITHIUM DODECYL SULFATE — 5 g, 25 g, 50 g
[2044-56-6]
(LDS; Lauryl sulfate lithium salt)
Molecular Biology Reagent
Purity: ~99%
$C_{12}H_{25}SO_4Li$ MW 272.33

151569 RT 2,6-LUTIDINE — 100 ml, 500 ml, 1 liter
[108-48-5]
(2,6-Dimethylpyridine)
1 ml = approx. 0.92 gm
Purity: 99%
C_7H_9N MW 107.2

194832 RT MAGNESIUM ACETATE — 50 g, 250 g
[16674-78-5]
Molecular Biology Reagent
Purity: ≥99%
Tetrahydrate
$C_4H_6O_4Mg \bullet 4H_2O$ MW 214.5

194833 RT MAGNESIUM SULFATE — 500 g, 1 kg, 5 kg
[10034-99-8]
Molecular Biology Reagent
Purity: ≥99%
Heptahydrate
$MgSO_4 \bullet 7H_2O$ MW 246.5

155334 RT MANGANESE CHLORIDE — 100 g, 500 g
[13446-34-9]
Crystalline
Tetrahydrate
$MnCl_2 \bullet 4H_2O$ MW 197.9

194834 2-MERCAPTOETHANOL — 25 ml, 100 ml, 250 ml
[60-24-2]
Molecular Biology Reagent
Purity: 98+%
Specially purified for molecular biology applications.
C_2H_6OS MW 78.13

CATALOG NUMBER

194835 RT **MES** — 10 g, 25 g, 100 g, 250 g
[4432-31-9]
(2-[N-Morpholino]ethanesulfonic acid)
Molecular Biology Reagent
Free Acid
Purity: ≥99%
Zwitterionic buffers
pKa = 6.15 at 25°C
$C_6H_{13}NO_4S \bullet H_2O$ MW 213.2

151609 0°C **2-MESITYLENESULFONIC ACID** — 5 g, 10 g, 25 g, 50 g
[3453-83-6]
Dihydrate
(2,4,6-Trimethylbenzenesulfonic acid)
Reagent for oligonucleotide synthesis
$(CH_3)_3C_6H_2SO_3H \bullet 2H_2O$ MW 236.3

151610 0°C **2-MESITYLENESULFONYL CHLORIDE** — 5 g, 10 g, 25 g, 50 g
[773-64-8]
(2,4,6-Trimethylbenzene sulfonyl chloride)
White to off-white crystals.
Coupling reagent for polynucleotide synthesis. Sulfonating agent for carbohydrates.
$C_9H_{11}ClO_2S$ MW 218.7

151611 0°C **1-(MESITYLENE-2-SULFONYL)-IMIDAZOLE** — 1 g, 5 g
[50257-39-1]
Crystalline
Purity: >97%
Reagent used in polynucleotide synthesis.
Ref.: Yu, A. Berlin, et al., Tetrahedron Lett., 1353 (1973).
$C_{12}H_{14}N_2O_2S$ MW 250.3

151612 0°C **1-(MESITYLENE-2-SULFONYL)-3-NITRO-1,2,4-TRIAZOLE** — 250 mg, 1 g
[74257-00-4]
(MSNT)
Crystalline
Condensing reagent for oligonucleotide synthesis
Ref.: Reese, C.B., et al., Tetrahedron, **36**, 3075 (1980).
$C_{11}H_{12}N_4O_4S$ MW 296.3

151613 0°C **1-(MESITYLENE-2-SULFONYL)-1H-TETRAZOLE** — 250 mg, 1 g
[59128-89-1]
(MESTET)
Condensing reagent for oligonucleotide synthesis.
Ref.: Narangy, S.A., et al., Nucleic Acids Res., **4**, 353 (1977).
$C_{10}H_{12}N_4O_2$ MW 252.3

151614 0°C **1-(2-MESITYLSULFONYL)-1H-1,2,4-TRIAZOLE** — 250 mg, 1 g, 5 g
[54230-59-0]
(MST)
Crystalline
Purity: >98%
Coupling reagent for nucleotide synthesis.
$C_{11}H_{13}N_3O_2S$ MW 251.3

151644 0-5°C **METHYL DICHLOROPHOSPHITE** — 1 g, 5 g, 10 g, 25 g, 50 g
[3279-26-3]
Purity: ~98%
Phosphorylating reagent for oligonucleotide synthesis by the triester method.
Ref.: Science, **214**, 270 (1981).
1 ml = approx. 1.41 g
CH_3Cl_2OP MW 132.9

CATALOG NUMBER

194836 RT **MINERAL OIL** — 5 ml, 5x5 ml, 500 ml
Molecular Biology Reagent
Light white oil
1 ml = approx. 0.84 gm
Ideal for overlaying aqueous samples and for centrifuge gradients.

194837 RT **MOPS** — 25 g, 100 g, 500 g
[1132-61-2]
(3-[N-Morpholino]propanesulfonic acid)
Molecular Biology Reagent
Purity: 99+%
Free Acid
Useful buffer range: 6.5-7.9
$C_7H_{15}NO_4S$ MW 209.3

194014 RT **ORANGE G** — 25 g, 100 g
[1936-15-8]
(Acid Orange 10; 7-Hydroxy-8-phenylazo-1,3-naphthalenedisulfonic acid; C.I. 16230)
Molecular Biology Reagent
Sodium Salt
A tracking dye in nucleic acid gel electrophoresis which runs significantly faster than bromophenol blue.
$C_{16}H_{10}N_2O_7S_2Na_2$ MW 452.4

194838 RT **PIPES** — 25 g, 100 g, 500 g
[5625-37-6]
(Piperazine-N,N′-bis[2-ethanesulfonic acid])
Molecular Biology Reagent
Purity: ≥99%
Free Acid
Buffer range: 6.1 to 7.5
pKa at 37°C = 6.66
$C_8H_{18}N_2O_6S_2$ MW 302.4

151905 0-5°C **PIVALOYL CHLORIDE** — 100 ml, 250 ml
[3282-30-2]
(Trimethylacetyl chloride)
Reagent for mixed anhydride peptide synthesis
1 ml = approx. 0.98 g
C_5H_9ClO MW 120.6

194839 RT **POLYETHYLENE GLYCOL** — 500 g, 1 kg, 2 kg
[25322-68-3]
Molecular Biology Reagent
MW AVERAGE 8,000

194017 RT **POLYVINYLPYRROLIDONE** — 100 g, 500 g, 1 kg
[9003-39-8]
Molecular Biology Reagent
Average MW 360,000
Suitable for nucleic acid hybridizations. No detectable nuclease activity.

194843 RT **POTASSIUM ACETATE** — 100 g, 500 g, 1 kg
[127-08-2]
Molecular Biology Reagent
Purity: ≥99%
$KC_2H_3O_2$ MW 98.14

194844 RT **POTASSIUM CHLORIDE** — 500 g, 1 kg, 5 kg
[7447-40-7]
Molecular Biology Reagent
Purity: ~99%
KCl MW 74.55

CATALOG NUMBER

194845 RT **POTASSIUM PHOSPHATE DIBASIC** — 100 g, 500 g, 1 kg
[16788-57-1]
Molecular Biology Reagent
Purity: ≥99%
Trihydrate
$K_2HPO_4 \bullet 3H_2O$ MW 228.2

194846 RT **POTASSIUM PHOSPHATE MONOBASIC** — 100 g, 500 g, 1 kg
[7778-77-0]
Molecular Biology Reagent
Purity: ≥98%
Anhydrous
KH_2PO_4 MW 136.09

151985 0°C ***syn*-PYRIDINE-2-ALDOXIME** — 1 g, 5 g, 10 g, 25 g
[873-69-8]
Crystalline
Deblocking reagent for phosphotriesters in oligonucleotide synthesis.
Ref.: Tetrahedron Letters, (1978) 2727, 4443.
$C_6H_6N_2O$ MW 122.1

821682 RT **RNase ERASE™** — 250 ml
Spray Bottle
A novel RNase decontamination solution. Completely removes RNase contamination from glass and plastic surfaces, pipettes, and equipment that must be "RNase-free."

821683 RT **RNase ERASE™** — 2x125 ml
Dropper/Squirt Bottle
A novel RNase decontamination solution. Completely removes RNase contamination from glass and plastic surfaces, pipettes, and equipment that must be "RNase-free."

821684 RT **RNase ERASE™** — 250 ml
Refill Bottle
A novel RNase decontamination solution. Completely removes RNase contamination from glass and plastic surfaces, pipettes, and equipment that must be "RNase-free."

194012 RT **SODIUM ACETATE** — 250 g, 1 kg, 5 kg
[127-09-3]
Molecular Biology Reagent
Anhydrous
Purity: >98%
$C_2H_3O_2Na$ MW 82.03

194847 RT **SODIUM BICARBONATE** — 250 g, 1 kg
[144-55-8]
Molecular Biology Reagent
Purity: ≥99%
$NaHCO_3$ MW 84.01

194848 RT **SODIUM CHLORIDE** — 500 g, 1 kg, 5 kg, 10 kg
[7647-14-5]
Molecular Biology Reagent
Purity: 99.5% min.
Crystalline
Ideal for all molecular biology applications
NaCl MW 58.44

194831 RT **SODIUM DODECYL SULFATE** — 25 g, 100 g, 250 g, 500 g, 1 kg
[151-21-3]
Molecular Biology Reagent
Purity: ~99%
$CH_3(CH_2)_{11}OSO_3Na$ MW 288.4

CATALOG NUMBER

194849 RT **SODIUM PHOSPHATE DIBASIC** — 250 g, 500 g, 1 kg
[7558-79-4]
Molecular Biology Reagent
Anhydrous
Na_2HPO_4 MW 141.96

194850 RT **SODIUM PHOSPHATE MONOBASIC** — 250 g, 500 g, 1 kg
[7558-80-7]
(Monosodium phosphate)
Molecular Biology Reagent
Purity: ≥98%
Anhydrous
NaH_2PO_4 MW 120

194851 RT **D-SORBITOL** — 100 g, 500 g, 1 kg, 5 kg
[50-70-4]
(D-Glucitol)
Molecular Biology Reagent
Purity: ≥98%
$C_6H_{14}O_6$ MW 182.2

194852 0-5°C **SPERMIDINE** — 1 g, 5 g, 25 g
[124-20-9]
(N-[3-Aminopropyl]-1,4-butanediamine)
Molecular Biology Reagent
Free Base
Purity: ~99%
Promotes T4 polynucleotide kinase activity.
$C_7H_{19}N_3$ MW 145.2

194018 RT **SUCROSE** — 500 g, 1 kg, 5 kg
[57-50-1]
Molecular Biology Reagent
Purity: 99+%
Glucose: <.1%
Heavy metals (Pb): <5 ppm
DNase, RNase, and protease free.
$C_{12}H_{22}O_{11}$ MW 342.30

152458 RT **TAPS** — 25 g, 100 g, 500 g
[91000-53-2]
Sodium Salt
Crystalline
$C_7H_{16}NO_6SNa$ MW 265.3

194853 RT **TES** — 25 g, 100 g, 500 g
[7365-44-8]
(N-Tris-[hydroxymethyl]methyl-2-aminoethanesulfonic acid)
Molecular Biology Reagent
Purity: ≥99%
Free Acid
pKa at 25°C = 7.5
Useful pH range 6.8-8.2
$C_6H_{15}NO_6S$ MW 229.2

156824 0-5°C ***meso*-TETRA(4-N-METHYL-PYRIDYL)PORPHYRIN** — 100 mg, 250 mg, 1 g
[36951-72-1]
Tetratosylate Salt

152120 RT **1H-TETRAZOLE** — 500 mg, 1 g, 5 g
[288-94-8]
Purity: 99+%
Suitable for preparation of the coupling reagent for automated synthesis of polynucleotides.
CH_2N_4 MW 70.1

CATALOG NUMBER

103105 0-5°C **1,2,4-TRIAZOLE** — 1 g, 5 g, 10 g, 25 g, 100 g
[288-88-0]
(Pyrrodiazole)
Crystalline
$C_2H_3N_3$ MW 69.1

152592 RT **TRICHLOROACETIC ACID, ACS** — 250 g, 500 g, 1 kg
[76-03-9]
ACS Reagent Grade
Purity: ≥99.0%
$C_2HCl_3O_2$ MW 163.4

NEW **196057** RT **TRICHLOROACETIC ACID SOLUTION** — 100 ml
[76-03-9]
6.1 N Solution
Approx. 100% (w/v)

NEW **196062** **TRICHLOROACETIC ACID SOLUTION** — 50 ml, 500 ml
[76-03-9]
0.18 N Solution
Approx. 3% (w/v)

NEW **196061** **TRICHLOROACETIC ACID SOLUTION** — 50 ml, 200 ml
[76-03-9]
0.38 N Solution
Approx. 6.25% (w/v)

NEW **196060** 0-5°C **TRICHLOROACETIC ACID SOLUTION** — 50 ml, 200 ml
[76-03-9]
0.49 N Solution
Approx. 8% (w/v)

NEW **196059** 0-5°C **TRICHLOROACETIC ACID SOLUTION** — 25 ml
[76-03-9]
0.60 N Solution
Approx. 10% (w/v)

NEW **196058** 0-5°C **TRICHLOROACETIC ACID SOLUTION** — 100 ml
[76-03-9]
0.73 N Solution
Approx. 12% (w/v)

194855 RT **TRIS** — 100 g, 250 g, 500 g, 1 kg, 5 kg
[77-86-1]
(Tris-[hydroxymethyl]amino-methane)
Molecular Biology Reagent
Purity: 99.95% min.
Buffering pH range 7.0-9.0
pKa at 25°C = 8.1
Excellent biochemical and biological buffer for all molecular biology applications.
$C_4H_{11}NO_3$ MW 121.14

CATALOG NUMBER

194856 RT **TRIS** — 100 g, 250 g, 500 g
[1185-53-1]
Molecular Biology Reagent
Purity: ≥99%
Hydrochloride
$C_4H_{11}NO_3 \bullet HCl$ MW 157.6

816204 **TRIS-EDTA BUFFER** — 1 box
10 mM Tris HCl
0.1 mM EDTA
Empty contents of 1 packet into a 4-liter flask and add deionized water. Four liters of pH 7.4 buffer is now ready for use. This buffer is useful for DNA extractions from Low Gelling Temperature (LGT) Agarose gels.
Note: If contents of 1 packet are dissolved in only 2 liters of deionized water, this buffer is then useful for DNA isolations with cesium chloride protocols.
(1 box contains 12 packets)

194854 **TRITON X-100** — 50 ml, 100 ml, 250 ml
Molecular Biology Reagent
Water Content: <1%
Pb ≤5 ppm
Triton is a registered trademark of Union Carbide Chemicals and Plastics Co., Inc.

194841 RT **TWEEN 20** — 50 ml, 100 ml
[9005-64-5]
(Polyoxyethylenesorbitan monolaurate)
Molecular Biology Reagent
Purity: ~50% lauric acid.

194842 RT **TWEEN 80** — 50 ml, 100 ml
[9005-65-6]
(Polyoxyethylenesorbitan monooleate)
Molecular Biology Reagent
Purity: ~70% oleic acid

194857 **UREA** — 100 g, 500 g, 1 kg, 5 kg
Molecular Biology Reagent
Purity: ≥98%
Pb <2 ppm
H_2NCONH_2 MW 60.06

821739 RT **WATER, DNase, RNase-FREE** — 500 ml
Deionized water treated with 0.001% diethylpyrocarbonate (DEPC). Filtered through 0.2 micron filter and autoclaved to yield a sterile solution completely free of detectable DNase (both exo and endo) and RNase.

194858 RT **ZINC CHLORIDE** — 100 g, 500 g
[7646-85-7]
Molecular Biology Reagent
Purity: ≥97%
$ZnCl_2$ MW 136.28