

Enzymes that modify nucleic acids provide the foundation for many molecular biology techniques. They are used to degrade, join or remove portions of nucleic acids in a controlled and generally defined manner. Specific features of the *in vivo* functions of these enzymes have been exploited *in vitro* to provide many of the protocols currently used in nucleic acid manipulations.

Deoxyribonuclease I, Ribonuclease & Protease Free

Molecular Biology Grade

Chromatographically purified to remove RNase and protease. Lyophilized in vials. Each 10 000 units vial contains 2 mg glycine, 2 μ moles calcium, and 10 000 units of DNase I. Dissolving the entire 10 000 units vial in 5 ml, or the entire 2 500 units vial in 1.25 ml, provides the equivalent of a 1 mg/ml solution.

Source : Bovine Pancreas

Minimum Activity : 2 000 units per mg dry weight

Description	Cat.#	Qty
Deoxyribonuclease I, Ribonuclease & Protease Free	T06510	2500 U
	T06511	10000 U

Deoxyribonuclease I

Chromatographically purified. Equivalent to 1x crystallized DNase. A lyophilized powder with glycine as a stabilizer.

Source : Bovine Pancreas

Minimum Activity : 2 000 K Units per mg dry weight

Description	Cat.#	Qty
Deoxyribonuclease I	243540	20 mg
	243541	100 mg

Deoxyribonuclease I

Purified precrystalline DNase. A lyophilized powder.

Source : Bovine Pancreas

Minimum Activity : 2 000 K Units per mg dry weight

Description	Cat.#	Qty
Deoxyribonuclease I	243545	25 mg
	243546	100 mg

DNase Af (recombinant)

DNase Af is a thermostable DNase from the hyperthermophilic sulphate-reducing archaeon *Archaeoglobus fulgidus*. The enzyme is cloned and overexpressed in *E. coli*. DNase Af shows strong DNA binding and nicking activity on double stranded DNA. It is active from 50 to 90 °C with an optimum at 80 °C.

The enzyme activity is depending on Mg^{2+} . Mn^{2+} can substitute Mg^{2+} at concentrations below 1 mM but results in a lower overall activity. Ca^{2+} almost completely inactivates the enzymatic activity of DNase Af, whereas the DNA binding property remains.

Applications :

- ◆ Degradation of double stranded DNA at higher temperatures
- ◆ Introducing of nicks in double stranded DNA at higher temperatures

Description	Cat.#	Qty
DNase Af	BN0000	1 mg
	BN0001	5 mg

Nucleic acid preparation

Modification Enzyme and inhibitors - removal kits

Lysozyme (Egg White)

A hydrolytic enzyme specific for proteins found in the lipid bi-layer of bacteria. Purified from egg white, Lysozyme has an activity > 20 Ku/mg. Each lot is screened for the presence of albumin, contaminating microorganisms (Salmonella), and is free of DNase and RNase activity.

Description	Cat.#	Qty
Lysozyme	13617A	5 g
	13617B	10 g

Proteinase K (Tritirachium Album)

A non-specific serine protease (MW~18,000 Da) that exhibits high activity in the presence of SDS, EDTA, and Urea as well as over a wide pH range. Available in a highly soluble (> 50 mg/ml) powder or as a 20 mg/ml liquid stock solution, each preparation is completely nuclease-free with a specific activity of > 30 units/mg.

Description	Cat.#	Qty
Proteinase K, Lyophilized Powder	858700	100 mg
	858701	500 mg
	858702	1 g
Proteinase K, 20 mg/ml Solution	718960	5 ml
	718962	25 ml

RNase A (Bovine Pancreas)

An endoribonuclease that efficiently hydrolyzes RNA contaminants in DNA preparations from tissue or bacterial cell cultures. Available in a lyophilized powder or 10 mg/ml stock solution (pH 8.0), RNase A is a high purity reagent.

Description	Cat.#	Qty
RNase A, Lyophilized Powder	918420	250 mg
	918421	500 mg
	918422	1 g
RNase A, 10 mg/ml Solution	734120	1 ml
	734121	5 ml

RNase Inhibitor (Human Placental Source)

Used to inhibit the activity of RNases in reaction mixtures for cDNA synthesis and *in vitro* transcription, as well as for long-term storage of valuable RNA samples. RNase Inhibitor is supplied at a concentration of 40 kU/ml.

Note : DTT is required for activation of this protein. (Best results with 5 mM DTT final concentration)

Description	Cat.#	Qty
RNase Inhibitor	973990	2 Ku
	973991	10 Ku

Exonuclease III (E.coli, Recombinant)

Exonuclease III (ExoIII) of *E. coli* is a 31 kD monomeric, globular protein combining multiple catalytic activities in one active site. It acts on doublestranded (ds) DNA as a 3'-5' exonuclease, a 3'-phosphomonoesterase, an apurinic/apyrimidinic (AP) sites specific endonuclease and an exonucleolytic ribonuclease H. Of particular interest for molecular biological methods is its exonucleolytic activity, removing 5'-mononucleotides from the 3'-hydroxyl ends of ds DNA, leaving protruding 5'-termini. Its catalytic rate can be adjusted by temperature and NaCl concentration and thus allows for the generation of single-stranded DNA templates for sequencing or recombination methods.

Applications :

- ◆ Construction of nested unidirectional deletions of DNA fragments in combination with nuclease S1
- ◆ Generation of a single-stranded template for dideoxy sequencing of DNA
- ◆ Site-directed mutagenesis
- ◆ Cloning of PCR products
- ◆ *in vitro* Recombination

Description	Cat.#	Qty
Exonuclease III, 200 U/μl	BL9620	30 000 Units
	BL9621	150 000 Units

Unit definition : One unit of this protein will inhibit 50% of the activity of 5 ng of RNase A.

Exo/S1 Kit (Exonuclease III/ S1 Nuclease Kit)

E. coli (ExoIII), *Aspergillus oryzae* (S1 Nuclease), Recombinant, *E. coli*

Exonuclease III (ExoIII) of *E. coli* is a 31 kD monomeric, globular protein combining multiple catalytic activities in one active site. It acts on doublestranded (ds) DNA as a 3'-5' exonuclease, a 3'-phosphomonoesterase, an apurinic/apyrimidinic (AP) sites specific endonuclease and an exonucleolyticribonuclease H.

S1 Nuclease is a single-strand specific nuclease, which degrades single-stranded nucleic acids, releasing 5'-phosphoryl mono- or oligonucleotides. The enzyme is five times more active on DNA than on RNA. The enzyme is a glycoprotein with carbohydrate content of about 18%.

Applications :

- ◆ Generation of nested deletions for convenient sequencing
- ◆ Generation of truncated proteins

Description	Cat.#	Qty
Exo/S1 Kit (Exonuclease III/ S1 Nuclease Kit)	BN0010	1 kit
Contents : Exonuclease III 10 000 U (200 U/μl), S1 Nuclease 1000 U (50 U/μl)		

Alkaline Phosphatase Solution, from Shrimp

Alkaline Phosphatase is used for the preparation of PCR generated DNA for sequencing, or dephosphorylation of DNA vector for cloning and DNA for end labeling. This Shrimp Alkaline Phosphatase is completely inactivated by heating at 65°C for 15 minutes unlike Calf Intestinal Alkaline Phosphatase. It's simple and quick procedures.

Description	Cat.#	Qty
Alkaline Phosphatase Solution, from Shrimp	BD9042	500 units

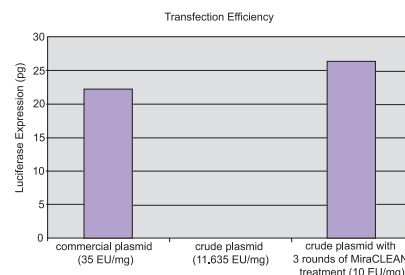
MiraCLEAN® Endotoxin Removal Kit

- ◆ Efficient removal of endotoxin from nucleic acid preparations.
- ◆ Ideal for in vivo and in vitro applications.
- ◆ Improved yields via distinct visualization of extraction phases.
- ◆ Simple protocol.

Many molecular biology laboratory applications require endotoxin-free preparations of plasmid DNA and high molecular weight genomic DNA. The **MiraCLEAN® Endotoxin Removal Kit** provides a convenient and improved method for the removal of bacterial endotoxins from nucleic acids for both in vivo and in vitro applications. *E. coli*, a Gram-negative eubacteria, is the common host for plasmid production. The outer leaflet of the outer membrane contains lipopolysaccharides (LPS, or endotoxin), which can cause inflammatory reactions, fever and endotoxic shock in vivo. Endotoxin in plasmid preparations is also known to decrease transfection efficiencies in vitro.

The MiraCLEAN® Kit is based on a rapid phase extraction of endotoxin. The proprietary pink-colored EndoGO Extraction Reagent allows better visualization of the interface between phases, thereby greatly facilitating phase separation and increasing recovery of nucleic acid. EndoGO Extraction Reagent and the MiraCLEAN® Buffer remove endotoxin contamination from DNA and thus, aid in the safety and efficiency of gene delivery research.

Description	Cat.#	Qty
MiraCLEAN® endotoxin removal kit	T82460	for 10 mg DNA
MiraCLEAN® endotoxin removal kit	T82461	for 100 mg DNA



The data show the average luciferase expression resulting from duplicate transfections completed on COS-7 cells in 35 mm plates in complete growth media. Cells were grown to approximately 60% confluency and transfected using 2 μg plasmid DNA (pCI-Luc)/ 2 μl of *TransIT*®-LT1 Reagent. Cells were harvested 24 hours post transfection and assayed for luciferase expression.

Each kit contains : EndoGO extraction reagent, MiraCLEAN® buffer