

Store at  
4°C

# Deoxyribonuclease I, Recombinant (Animal-Free, Protease and RNase Free)

**Cell Signaling**  
TECHNOLOGY®

#53331

10,000 units

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## For Research Use Only. Not For Use In Diagnostic Procedures.

**Description:** Deoxyribonuclease I, Recombinant (Animal-Free, Protease and RNase Free), also known as DNase I, is isolated from bovine pancreas and produced recombinantly in *Pichia pastoris*. This endonuclease cleaves DNA to produce products with 5'-phospho and 3'-hydroxy ends (1). DNase I is dependent on calcium ions (Ca<sup>2+</sup>) and activated by magnesium ions (Mg<sup>2+</sup>) and manganese ions (Mn<sup>2+</sup>). The Ca<sup>2+</sup> work to maintain the enzyme conformation and the Mg<sup>2+</sup> and Mn<sup>2+</sup> help to catalyze the cleavage of phosphodiester bonds (2). In the presence of Mg<sup>2+</sup>, DNase I cleaves each strand of dsDNA independently and at random. In the presence of Mn<sup>2+</sup>, DNase I cleaves each strand of dsDNA at approximately the same site. This enzyme can be used to remove genomic DNA from RNA preparations prior to RT-PCR, to degrade DNA templates after transcription reactions, and to remove unwanted DNA from samples prior to Northern blotting (3-5). DNase is used in tissue dissociation protocols to digest any DNA that may be present due to cell damage.

**Specificity/Sensitivity:** One Kunitz unit digests 1 mg of calf thymus DNA in 10 minutes at 37°C in 50 mM Tris, 1 mM Mg<sup>2+</sup>, 1 mM Ca<sup>2+</sup>, pH 7.8. The correlation of digestion units with Kunitz units can change in other buffer systems.

**Source/Purification:** Deoxyribonuclease I, Recombinant (Animal-Free, Protease and RNase Free) is chromatographically purified from recombinant bovine pancreatic Deoxyribonuclease I produced in *Pichia pastoris*. Production in yeast decreases levels of contaminating RNase and eliminates potential pathogens associated with animal-based materials.

**Purity:** > 99% purity was determined by SDS-PAGE.

**Activity:** ≥ 5,000 units per mg protein

**Unit Definition:** One unit causes an increase in absorbance at 260 nm of 0.001 per minute at 25°C when reacting with highly polymerized DNA at pH 5.0 (6).

**Storage:** Deoxyribonuclease I, Recombinant (Animal-Free, Protease and RNase Free) is a lyophilized powder that contains glycine as a stabilizer. Store at 4°C and protect from moisture. This product is stable for 12 months when stored at 4°C. Once in solution, store at -20°C. *Aliquot to avoid multiple freeze/thaw cycles.*

**Directions for Use:** Deoxyribonuclease I, Recombinant (Animal-Free, Protease and RNase Free) contains 10,000 units and is sensitive to denaturation. Mix by gently inverting the tube. Do not vortex. It is recommended to reconstitute with a buffer compatible with the intended assay. Vials should be brought to room temperature prior to opening and they should not be opened in humid areas.

### Background References:

- (1) Lauková, L. et al. (2020) *Biomolecules* 10, .
- (2) Suck, D. (1994) *J Mol Recognit* 7, 65-70.
- (3) Rio, D.C. et al. (2010) *Cold Spring Harb Protoc* 2010, pdb. prot5443.
- (4) Stöcher, M. and Berg, J. (2004) *Biotechniques* 36, 480-2.
- (5) Mishima, E. et al. (2015) *PLoS One* 10, e0143756.
- (6) KUNITZ, M. (1950) *J Gen Physiol* 33, 349-62.

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