



Worthington Elastase is prepared from porcine pancreas. It is extensively used in tissue and cell dissociation procedures. Elastase is effective in the isolation of Type II lung cells. Because elastin is found in the highest concentrations in the elastic fibers of connective tissues, elastase is frequently used to dissociate tissues which contain extensive intercellular fiber networks. The viscous extracellular ground substance in which connective tissue cells and fibers are embedded is a complex mixture of various glycoproteins. Given the complexity of this matrix, proteolytic digestion proceeds best when elastase is used in concert with other enzymes such as collagenase, trypsin and chymotrypsin.

Worthington also produces a lyophilized form of our widely used crystalline elastase preparation. This product can be used in place of the aqueous suspension preparation for tissue dissociation and cell isolation applications. It offers the convenience, stability, and versatility of a lyophilized powder along with the enzymatic activity of the liquid preparation.

PRODUCT HIGHLIGHT

Description	Activity	Code	Catalog No.	Size
Elastase, Purified A chromatographically purified, lyophilized water soluble powder. Store at 2 - 8°C.	≥ 8 Units per mg protein	ESFF*	LS006363 LS006365 LS006367	5 mg 20 mg Bulk
Elastase, Suspension 0.22µm filtered twice crystallized, aqueous suspension. The diluted enzyme should be 0.22 micron filtered before use. Suitable for Type II lung cell isolation. Store at 2 - 8°C. <u>Do not freeze.</u>	≥ 3 Units per mg protein	ES*	LS002274 LS002279 LS002280 LS002276	25 mg 100 mg 1 gm Bulk
Elastase, Lyophilized 0.22µm filtered twice crystallized preparation supplied as a lyophilized powder. Suitable for Type II lung cell isolation. Store at 2 - 8°C. <u>Does not require special shipping.</u>	≥ 3 Units per mg protein	ESL	LS002290 LS002292 LS002294 LS002298	25 mg 100 mg 1 gm Bulk

*Requires special shipping

Elastase has a molecular weight of 25,900 daltons, and the optimum pH is 8.5. Elastase is a serine protease consisting of a single peptide chain of 240 residues with four disulfide bridges (Shotton and Hartley 1973)⁴. According to Bieth and Wermuth (1973)², it is possible that the active center is composed of several subsites with a specificity for peptide bonds adjacent to neutral amino acids. It also exhibits esterase and amidase activity. While elastase will hydrolyze a wide variety of protein substrates, it is unique among proteases in its ability to hydrolyze native elastin, a substrate not attacked by trypsin, chymotrypsin or pepsin. It is produced in the pancreas as an inactive zymogen, proelastase, and activated in the duodenum by trypsin.

Elastase is also found in blood components and bacteria. The enzyme is inhibited by diisopropylphosphofluoridate (DFP) and alkyl isocyanates; derivatives of dipeptides of alanine, valine, leucine and isoleucine are effective competitive inhibitors. Soybean trypsin inhibitor and kallikrein inhibitor suppress proteolytic but not elastolytic activity. Elastase is assayed using a method derived from that of Feinstein *et al.*, (1973)³ and using the more soluble substrate of Bieth *et al.*, (1974)¹. An increase in absorbance at 410 nm results from the hydrolysis of N-succinyl-L-Ala-L-Ala-L-Ala-p-nitroanilide (SucAla₃NA).

Stability: Elastase is unstable below pH 3-4. When stored as a dry powder the enzyme is stable for 6-12 months at 2 - 8°C. Elastase product codes: ES and ESL have poor solubility at neutral pH and at concentrations greater than 0.25%. It is suggested that primary solutions be made in KCl or alkaline buffers and diluted into the reaction mixtures or media, compensating for ionic strength or pH changes. Stable to pH 10.4.

Storage: Store at 2-8°C.

Unit Definition: 1 Unit converts 1µmole of N-succinyl-trialanyl-p-nitroanilide per minute at 25°C.

Technical Notes

Conversion to older unit: 1 SucAla₃NA unit = 6 elastin digestion units.

Aqueous liquid suspensions should be aseptically handled to avoid bacterial contamination. Due to the viscous nature of the aqueous suspension (Code: ES) it is recommended that vial be rinsed to recover contents.

References

1. Bieth, J., Spiess, B., and Wermuth, C.G.: The Synthesis and Analytical Use of a Highly Sensitive and Convenient Substrate of Elastase. *Biochem. Med.*, **11**, 350 (1974).
2. Bieth, J., and Wermuth, C.G.: The Action of Elastase on p-Nitroanilide Substrates. *Biochem. Biophys. Res. Comm.*, **53**, 383 (1973).
3. Feinstein, G., Kupfer, A., and Sokolovsky, M.: N-Acetyl-(L-Ala)₃-p-Nitroanilide as a New Chromogenic Substrate for Elastase. *Biochem. Biophys. Res. Comm.*, **50**, 1020 (1973).
4. Shotton, D.M., and Hartley, B.S.: Evidence for the Amino Acid Sequence of Porcine Pancreatic Elastase. *Biochem. J.*, **131**, 643 (1973).

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<https://www.Worthington-Biochem.com/products>

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