



Worthington Papain is purified from *Carica papaya* latex. This enzyme has wide specificity, and it will degrade most protein substrates more extensively than the pancreatic proteases. For tissue dissociation applications papain has proved less damaging and more effective than other proteases. Huettner and Baughman [*J. Neuroscience*, 6, 3044 (1986)] described a method using papain to obtain high yields of viable, morphologically intact cortical neurons from postnatal rats which is the basis of our Papain Dissociation System, Code: PDS.

Worthington also produces a lyophilized form of our widely used crystalline papain preparation. This product (Code: PAPL) can be used in place of the aqueous suspension preparation for immunochemical 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	Price
<b>Suspension, Twice Crystallized 0.22µm Filtered</b> A suspension in 0.05M sodium acetate, pH 4.5. It is recommended that the enzyme be fully activated before use in a solution containing 1.1mM EDTA, 0.067mM mercaptoethanol and 5.5mM cysteine-HCl for 30 minutes. Store at 2 - 8°C.	Activates to ≥ 20 Units per mg protein	<b>PAP*</b>	LS003124	25 mg	\$ 36.00
			LS003126	100 mg	80.00
			LS003127	1 gm	520.00
			LS003128	Bulk	Inquire
<b>Lyophilized Powder</b> Prepared from twice crystallized suspension containing sodium acetate. It is recommended that before use, the enzyme be fully activated as described above. Store at 2 - 8°C.	Activates to ≥ 15 Units per mg protein	<b>PAPL</b>	LS003118	25 mg	\$ 38.00
			LS003119	100 mg	90.00
			LS003120	1 gm	595.00
			LS003122	Bulk	Inquire
<b>Papain Vial, PDS Kit Component</b> Papain containing L-cysteine and EDTA, five single use 100 unit vials per package. This material is 0.22µm membrane filtered and lyophilized in autoclaved vials. A vial reconstituted with five mls of EBSS (vial 1) yields a solution at 20 units of papain per ml in one millimolar L-cysteine with 0.5mM EDTA. Brief incubation is needed to insure full solubility and activity. Store at 2 - 8°C.	Activates to ≥ 100 Units per vial	<b>PAP2</b>	LK003176	1 vi	\$ 26.00
			LK003178	5 vi	88.00

\*Requires special shipping

Papain has a molecular weight of 23,000 daltons and an optimum pH range of 6.0 - 7.0. It may exist as a zymogen since native crystalline papain is unreactive until acted upon by mild reducing agents, e.g., cysteine or cyanide. In addition to its proteolytic activity, papain is also an esterase. The action of papain on leucine methyl ester produces an insoluble polyleucine peptide. Papain is activated by cysteine, sulfide, and sulfite. It is enhanced when heavy metal binding agents such as EDTA are also present. N-bromosuccinimide enhances enzyme activity. Papain is inhibited by sulfhydryl reagents, heavy metals, ovomucoid trypsin inhibitor and carbonyl reagents. Papain may be inactivated by H<sub>2</sub>O<sub>2</sub>, the active SH group being oxidized to sulfenic acid. Papain is assayed using a titrimetric determination of the acid produced during the hydrolysis of benzoyl-L-arginine ethyl ester (BAEE). It is recommended that the enzyme be fully activated before use. Stabilizing agents are EDTA, cysteine and dimercaptoethanol.

**Stability:** Stable for 6 months at 2 - 8°C.

**Storage:** Store at 2 - 8°C. Do not freeze aqueous suspensions.

**Unit Definition:** 1 unit hydrolyzes 1 μmole of benzoyl-L-arginine ethyl ester per minute at 25°C, pH 6.2, after activation in a solution containing 1.1mM EDTA, 0.067mM mercaptoethanol and 5.5mM cysteine-HCl for 30 minutes.

#### Technical Notes

Papain should be activated before use to ensure maximum activity. The normal activation buffer is a solution containing 1.1mM EDTA, 0.067mM mercaptoethanol and 5.5mM cysteine-HCl. After 30 minutes in this solution, the enzyme is completely activated.

**For a listing of up-to-date enzyme and biochemical citations, go to:  
<http://Worthington-Biochem.com/index/manual.html>**

#### Related Products

Cell Isolation Optimizing System • Collagenase • Deoxyribonuclease I • Elastase • Hyaluronidase • Neonatal Cardiomyocyte Isolation Kit  
Neutral Protease (Dispase®) • Papain (Neural) Dissociation System • Hepatocyte Isolation System • Proteinase K  
STEMxyme® 1 & 2 Collagenase/Neutral Protease Blends • Trypsin • Trypsin Inhibitors

For Product Catalog, Tissue Dissociation Guide and Enzyme Manual, go to: [Worthington-Biochem.com](http://Worthington-Biochem.com)