

Worthington Protease Protein Research Products



SEQUENZ® TRYPsin, Modified

TRYPsin, Sequencing, Native

ENDO-ARG-C

ENDO-GLU-C

ENDO-LYS-C

CHYMOTRYPsin

CARBOXYPEPTIDASE Y

New Worthington Proteases for Protein Sample Prep

Trust your proteomics discoveries to Worthington. This catalog details our well-respected enzyme line for proteins requiring enzymatic digestion into peptides. Our expanded line of proteases enzymes appropriate for proteomic applications includes Arg-C, Glu-C, Lys-C and *SequENZ*[®] Modified Trypsin.

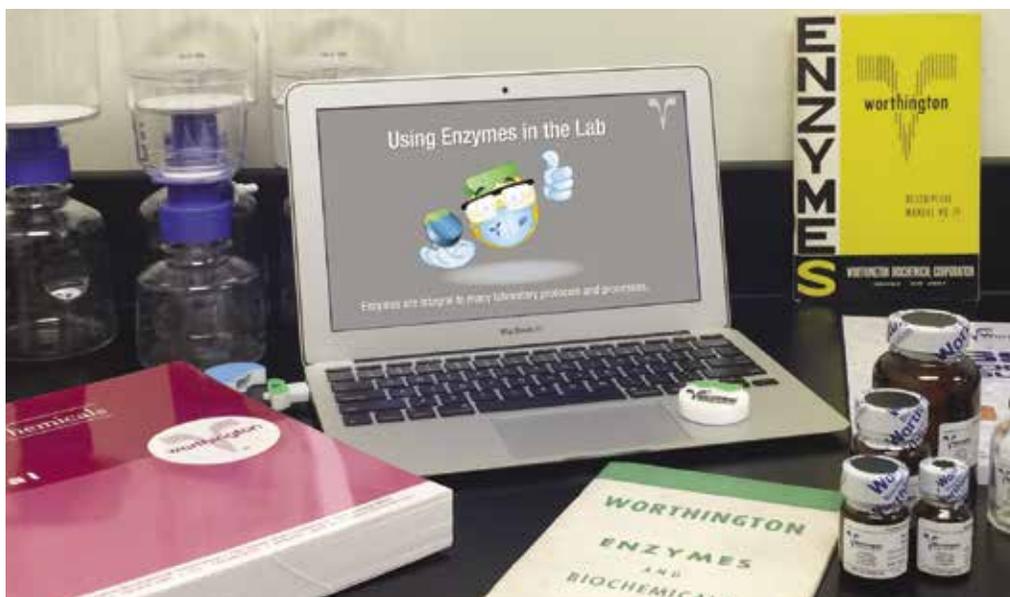
Sharing Our Enzyme Expertise

Education is a top priority at Worthington, and we have been authoring technical manuals and guides for over 70 years. Plus Worthington is cited in thousands of respected scientific journals across the globe.

To Support Your Research, We Provide Online Resources To Include:

- Advanced tissue search feature in the Tissue Dissociation Guide section of our website
- Comprehensive citations listings at: Bioz.com for Worthington products to obtain article snippets with technique filtering capabilities
- Collagenase Sampling Program to pre-test a particular lot of collagenase you are planning to use in your experiment. This free service allows you to pre-sample several different lots of collagenase at a time and select the best of the group for your application.

We invite you to work with us hand-in-hand to enhance our proteomics research technical library by submitting protocols, citations and articles referencing Worthington enzymes that can be shared with your colleagues. For details on submissions, contact your local Worthington Account Manager or forward suggestions to: techservice@worthington-biochem.com.



From writing the definitive Enzyme Manual decades ago, to our just released Introduction to Enzymes Video, our field account managers are here to assist you with the best products and services for your research.

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Name	Activity	Catalog Number	Package	Code
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Trypsin

Source: Bovine Pancreas

I.U.B.: 3.4.21.4 **CAS Number:** 9002-07-7

Trypsin is a pancreatic serine protease with substrate specificity based upon positively charged lysine and arginine side chains. It is derived from a 34 kDa inactive precursor zymogen, trypsinogen, after enzymatic removal of an N-terminal 6-amino acid leader sequence resulting in the 23.8 kDa trypsin molecule. The optimum pH is 8.0. Trypsin is inhibited by organophosphorus compounds such as diisopropylfluorophosphate and natural inhibitors from pancreas. Soybean, lima bean, and egg white are also sources of natural inhibitors. Trypsin cleaves amide and ester bonds of Arg and Lys. The Worthington Sequencing Grade Trypsin has been further purified to remove trace contaminating proteases and autolysis products which could interfere in trypsin digestion experiments, and exhibits a single band on SDS PAGE.

Uses: For tissue culture work, Worthington trypsin, Codes: TRL, TRLS, TRLVMF and TRTVMF have been used by many researchers. Product Codes: TRSEQZ, TRSEQII and TRTPCK are typically used for protein sequencing, mapping and structure studies. Worthington modified sequencing grade trypsin, Product Code: TRSEQZ, is subjected to extensive purification to remove contaminating proteases and tryptic autolysis by-products which could affect the specificity of the digestion process. Subsequently, the enzyme is chemically modified to minimize the autolysis process as well as increase the stability. The modified trypsin is processed further to remove residual autodegradation products. The specificity of the enzyme is routinely checked after the chemical modification.

Stability/Storage: Most grades of Worthington trypsin are stable for 2-3 years when stored at 2-8°C. Protect from moisture.

Unit Definition: TAME Unit: One Unit hydrolyzes 1 micromole of *p*-toluene-sulfonyl-L-arginine methyl ester (TAME) per minute at 25°C, pH 8.2, in the presence of 10 mM calcium.
One TAME Unit = 19.2 USP/NF units = 57.5 BAEE units.

Technical Notes: The Virus and Mycoplasma Free trypsin (Code: TRTVMF) has been filtered through an 0.22 micron pore size membrane, lyophilized, subjected to gamma irradiation, and tested for virus and mycoplasma.

Worthington certifies that all lots of Trypsin products are subjected to a pH of less than 3.0 for greater than five (5) hours during processing.

SequENZ® Trypsin, Modified, Sequencing Grade

TRSEQZ

Trypsin, treated with	≥ 150 Units	LS02120	4 x 25 µg
L-(tosylamido-2-phenyl) ethyl	per mg protein	LS02122	4 x 100 µg
chloromethyl ketone to inhibit	(≥ 8,625	LS02123	1 mg
contaminating chymotryptic activity,	BAEE/2875	LS02124	Bulk
chemically modified to promote stability	USP/NF units		
and further purified to remove autolysis	per mg protein)		

fragments, resulting in a highly stable trypsin product resistant to autolysis while retaining specificity.

Store at -20°C

PROTECT FROM MOISTURE.

REQUIRES SPECIAL SHIPPING: ICE PACK

Name	Activity	Catalog Number	Package	Code
Trypsin (Continued)				
Trypsin, Modified, Sequencing Grade, Solution				
<p>Trypsin, treated with L-(tosylamido-2-phenyl) ethyl chloromethyl ketone to inhibit contaminating chymotryptic activity, chemically modified to promote stability and further purified to remove autolysis fragments, resulting in a highly stable trypsin product resistant to autolysis while retaining specificity. Supplied as a 1mg/ml solution. Store at -20°C REQUIRES SPECIAL SHIPPING: ICE PACK</p>	<p>≥ 150 Units per mg protein (≥ 8,625 BAEE/2875 USP/NF units per ml)</p>	<p>LS02150 LS02152 LS02155</p>	<p>250 µg 1000 µg Bulk</p>	TRSEQZS
Trypsin, Purified, Sequencing Grade II				
<p>Bovine trypsin that has been treated with L-(tosylamido-2-phenyl) ethyl chloromethyl ketone (TPCK) to inhibit contaminating chymotryptic activity and extensively purified to remove autolysis products. Supplied as a lyophilized powder. Store at -20°C. PROTECT FROM MOISTURE. REQUIRES SPECIAL SHIPPING: ICE PACK</p>	<p>≥ 150 Units per mg protein (≥ 8,625 BAEE/2875 USP/NF units per mg protein)</p>	<p>LS02115 LS02117 LS02119 LS02118</p>	<p>4 x 25 µg 4 x 100 µg 1 mg Bulk</p>	TRSEQII
Trypsin, TPCK Treated				
<p>A chromatographically purified, diafiltered, lyophilized powder that has been treated with L-(tosylamido-2-phenyl) ethyl chloromethyl ketone (TPCK) to inhibit contaminating chymotryptic activity (Kostka and Carpenter, <i>J. Biol. Chem.</i> 239, 1799, 1964. Store at 2-8°C. PROTECT FROM MOISTURE.</p>	<p>≥ 180 Units per mg protein (≥ 10,350 BAEE/3,450 USP/NF u/mg protein)</p>	<p>LS003740 LS003741 LS003744 LS003742</p>	<p>100 mg 500 mg 1 gm Bulk</p>	TRTPCK

Name	Activity	Catalog Number	Package	Code
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Clostripain (Endoproteinase-Arg-C)

Source: *Clostridium histolyticum*

I.U.B.: 3.4.22.8 CAS Number: 9028-00-6

Clostripain (Endoproteinase-Arg-C) is a two chain cysteine proteinase associated with collagenase and isolated from *Clostridium histolyticum*. It is highly specific for the carboxyl peptide bond of arginine. Clostripain is activated by dithiothreitol, cysteine, or other sulfhydryl containing reagents. The presence of calcium ions is essential. The enzyme is inhibited by oxidizing agents, divalent cations such as Co²⁺, Cu²⁺, Cd²⁺, and heavy metal ions. Citrate, borate, and Tris anions are less inhibitory.

Unit Definition: One Unit hydrolyzes one micromole of N-benzoyl-L-arginine ethyl ester per minute at 25°C, pH 7.6, in the presence of dithiothreitol.

**Clostripain (Endoproteinase-Arg-C)
Sequencing Grade**

CPSEQ

Chromatographically purified. A dialyzed, pre-activated, lyophilized powder. Supplied in 10 µg high recovery vials. Store at 2-8°C.	≥ 50 Units per mg protein	LS02135 LS02139	10 ug Bulk
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Clostripain (Endoproteinase-Arg-C)

CP

Chromatographically purified. A dialyzed, pre-activated, lyophilized powder. Store at 2-8°C.	≥ 50 Units per mg dry weight	LS001641	1 mg
		LS001643	5 x 1 mg
		LS001646	10 mg
		LS001647	Bulk



Our mission is to provide superior tools from discovery research through larger scale bioprocessing applications.

Name	Activity	Catalog Number	Package	Code
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Protease, *Staphylococcus aureus* (Endoproteinase Glu-C)

Source: *Staphylococcus aureus* V8

I.U.B.: 3.4.21.19 **CAS Number:** 66676-43-5

Protease *Staphylococcus aureus* V8 (Endoproteinase-Glu-C) specifically cleaves peptide bonds on the COOH-terminal side of either aspartic or glutamic acids. In the presence of ammonium, the enzyme specificity is limited to glutamic sites. It has a molecular weight of 27 kDa and optimum pH of 4.0 and 7.8 with hemoglobin as the substrate. Protease *Staphylococcus aureus* V8 is inhibited by diisopropylfluorophosphate and monovalent anions such as F⁻, Cl⁻, CH₃COO⁻ and NO₃⁻. Enzyme activity is determined by the casein digestion assay described by Drapeau, *Methods Enzymol.*, 45, 469 (1976).

Stability/Storage: Autolysis occurs at temperatures greater than 40°C. The enzyme is fully active in USP 0.2% SDS. Stable for 12 months at 2-8°C.

Unit Definition: One unit causes a change of 0.001 A₂₈₀ nm per minute at 37°C, pH 7.8 using casein as the substrate.

Protease, *S. aureus* Sequencing Grade

Chromatographically purified according to Drapeau, *et al.*, *J. Biol. Chem.*, 247, 6720 (1972). Supplied in vials containing 10 µg or 50 µg lyophilized powder for protein sequencing applications. Store at 2-8°C.

≥ 500 units	LS02126	5x10 ug
per mg dry	LS02128	5x50 ug
weight	LS02129	Bulk

STSEQ

Protease, *S. aureus* (Endoproteinase Glu-C)

Chromatographically purified according to Drapeau, G., Boily, Y., and Houmard, J., *J. Biol. Chem.*, 247, 6720 (1972). A lyophilized powder. Store at 2-8°C.

≥ 500 units	LS003608	1 mg
per mg dry	LS003605	5 mg
weight	LS003606	Bulk

STAP



Worthington employees take pride in developing the highest quality enzymes.

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ISO9001 Certified

Name	Activity	Catalog Number	Package	Code
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Endoproteinase Lys-C

Source: *Lysobacter enzymogenes*

I.U.B.: 3.4.21.50 **CAS Number:** 72561-05-8

Endoproteinase-Lys-C is a serine endoproteinase that specifically cleaves peptide bonds at the carboxyl side of lysine. It has a molecular weight of 30,000 daltons and is used in the optimal pH range of 7.0-9.0. Lys-C is inhibited by diisopropyl-fluorophosphate, TLCK, Aprotinin and Leupeptin.

Stability/Storage: Stable for 12 months at 2-8°C.

Unit Definition: One Unit will hydrolyze 1.0 micromole of N-p-tosyl-Gly-Pro-Lys p-nitroanilide per minute at pH 7.7 and 25C.

Endoproteinase Lys-C, Sequencing Grade

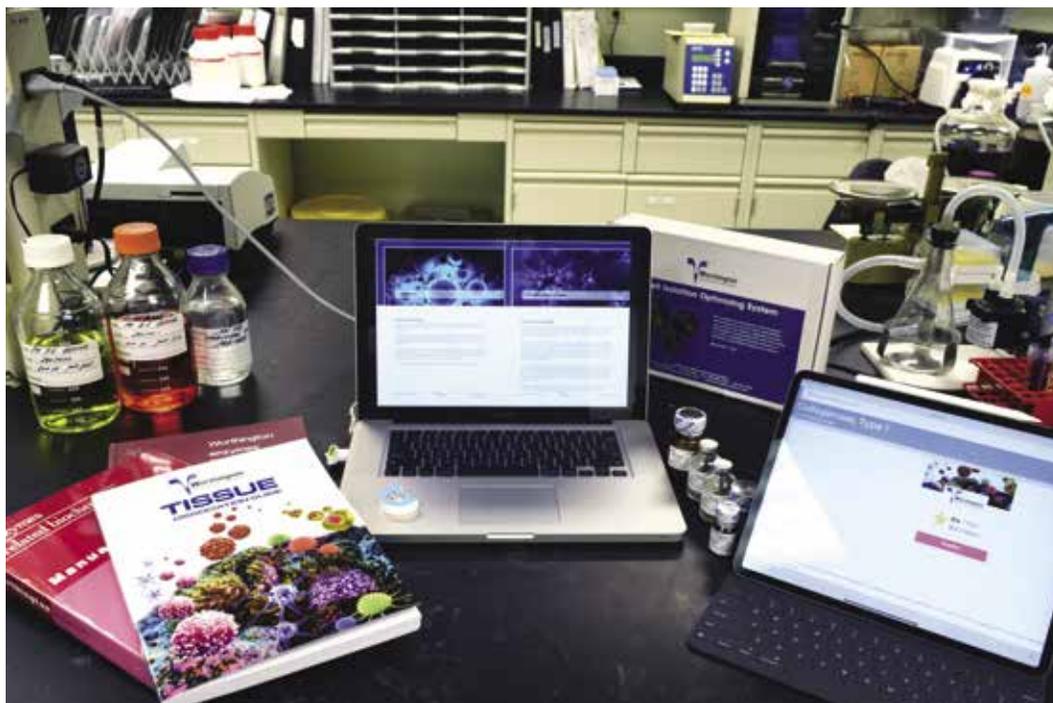
Chromatographically purified.
A lyophilized powder supplied in
20 ug high recovery vials.
Store at -20°C.

≥ 150 units
per mg
protein

LS02143
LS02144
LS02145

20 ug
5x20 ug
Bulk

LYSCSEQ



Bringing you new ways to stay abreast of current methods, applications and products.

Name	Activity	Catalog Number	Package	Code
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Chymotrypsin

Source: Bovine Pancreas

I.U.B.: 3.4.21.1 CAS Number: 9004-07-3

Chymotrypsin preferentially catalyzes the hydrolysis of peptide bonds involving L-isomers of tyrosine, phenylalanine and tryptophan. It also readily acts upon amides and esters of susceptible amino acids. Chymotrypsin catalyzes the hydrolysis of bonds of leucyl, methionyl, asparaginyl and glutamyl residues.

Stability/Storage:: The enzyme is stable for days in solution at pH 3.0 and for years as a dry powder at 2-8°C. Protect from moisture.

Unit Definition: One Unit hydrolyzes one micromole of benzoyl-L-tyrosine ethyl ester per minute at 25°C, pH 7.8 in the presence of calcium. An activity of 45 Units per mg using the above definition, is the equivalent of 10,000 optical density or 1330 N.F. units per mg using ATEE as a substrate.

1 BTEE unit = 29.5 USP/NF units.

Chymotrypsin, Alpha, TLCK Treated, Sequencing Grade Three times crystallized and treated with 1-chloro-3-tosylamido-7-amino-2-heptanone (TLCK) to inhibit trypsin activity (Shaw, <i>et al.</i> , <i>Biochemistry</i> , 4, 2219, 1965). Dialyzed against 1 mM HCl to remove autolysis products and low molecular weight contaminants. Supplied lyophilized in 25 ug and 100 ug high-recovery vials. Store at 2-8°C.	≥ 45 Units per mg protein	LS02130	4 x 25 ug	CDSEQ
		LS02132	4 x 100 ug	
Chymotrypsin, Alpha, TLCK Treated Three times crystallized and treated with 1-chloro-3-tosylamido-7-amino-2-heptanone (TLCK) to inhibit trypsin activity (Shaw, <i>et al.</i> , <i>Biochemistry</i> , 4, 2219 1965). Dialyzed against 1 mM HCl to remove autolysis products and low molecular weight contaminants. Supplied as a dialyzed, lyophilized powder. Store at 2-8°C.	≥ 45 Units per mg protein	LS001430	25 mg	CDTLCK
		LS001432	100 mg	
		LS001434	1 gm	
		LS001438	Bulk	
Chymotrypsin, Alpha, Purified Chromatographically prepared by the procedure of Yapel <i>et al.</i> , <i>J. Amer. Chem. Soc.</i> , 88, 2573 (1966). A lyophilized powder. Store at 2-8°C.	≥ 45 Units per mg protein	LS001475	100 mg	CDS
		LS001479	1 gm	
		LS001477	Bulk	
Chymotrypsin, Alpha, 3X Three times crystallized alpha chymotrypsin, which is an activation product of a three times crystallized zymogen. Dialyzed against 1 mM HCl and lyophilized. Store at 2-8°C.	≥ 45 Units per mg protein	LS001448	250 mg	CDI
		LS001450	1 gm	
		LS001451	10 gm	
		LS001453	Bulk	
Chymotrypsin, Alpha, Crystallized Crystallized as zymogen and activated. Dialyzed against 1 mM HCl and lyophilized. Store at 2-8°C.	≥ 35 Units per mg protein	LS001333	1 gm	CDAG
		LS001334	10 gm	
		LS001332	Bulk	

Name	Activity	Catalog Number	Package	Code
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Carboxypeptidase Y

Source: Yeast

I.U.B.: 3.4.16.5 **CAS Number:** 9046-67-7

Carboxypeptidase Y is a glycoprotein exopeptidase of the 'acid' and 'serine' class. Carboxypeptidase Y has a broad amino acid specificity, including proline and amidated amino acid residues.

Unit Definition: One Unit hydrolyzes 1 micromole of benzyl-oxycarbonyl-L-phenylalanyl-L-leucine per minute at 25°C, pH 6.5.

Carboxypeptidase Y

A highly purified preparation supplied as a lyophilized powder. Store at -20°C.

≥ 50 Units per
mg protein

LS009070
LS009068
LS009071

1 mg
5 mg
Bulk

COY



From research and development to manufacturing, continuous quality improvement is everyone's job.

Worthington Protease Products, Specifications and Applications Table

Enzyme	Specificity	Molecular Weight KDa	pH Optimum	Extinction Coefficient E1%, 280nm	Common Substrates	Activators	Inhibitors	Product Code/ Applications
Proteases For Protein Sequencing								
Carboxy-peptidase Y	H ₂ -N-Rn-Y-†-X-COOH X, Y= non-specific, prefers aromatic	64.0	4.5-6.0	15.0 (Hayashi <i>et al.</i> 1973, and Kuhn <i>et al.</i> 1973)	ATEE Bz-Phe-Ala-Leu Z-Phe-Ala	None required	APCK, Aprotinin DFP 4-Hydroxymercuribenzoate PMSF	COY, C-terminal sequencing & Modification/labeling of peptides and proteins
Chymotrypsin TLCK treated	-X-†-Y- X = aromatic Y = nonspecific	25.6	7.8-8.0	20.57 (Theoretical)	ATEE BTEE	None required	α-antitrypsin Aprotinin DFP, PMSF, TPCK α ₂ -macroglobulin	CDSEQ, CDTLCK, Sequence analysis Peptide synthesis, mapping/fingerprinting
Endo-Arg-C (Clostripain)	-Arg-†-Y- Y = nonspecific	53	7.4-7.8	16.57 (Theoretical)	BAEE	Ca ²⁺ Reducing agents	EDTA, TLCK, Tris Hg ²⁺ & other heavy metal ions	CPSEQ, CP, Peptide mapping & synthesis Sequence analysis Hydrolysis/condensation of amide bonds
Endo-Glu-C (Staph. Protease V8)	-Glu-†-Y- (NH ₄ buffers pH 4, 7.8) -Asp-†-Y- (PO ₄ buffer pH 7.8)	27.0	4.0 & 7.8	4.26 (Houmard 1976)	Casein Z-Phe-Leu-Glu-4NA	None required	DFP F-, Cl-, Br-, CH ₃ COO- NO ₃ - α ₂ -macroglobulin	STSEQ, STAP, Peptide mapping & sequence analysis
Endo-Lys-C	-Lys-†-Y- Y = nonspecific	30.0	7.0-9.0	18.63 (Theoretical)	N-p-Tosyl-Gly-Pro-Lys pNA	None required	DFP, TLCK, Aprotinin, Leupeptin	LYS-C, LYSEQ Peptide mapping and sequence analysis
SequENZ® Trypsin, Sequencing Grade, Modified								TRSEQZ, Modified Sequencing Grade, chemically modified to reduce autolysis Peptide mapping & sequence analysis
Trypsin, Sequencing Grade, Native	-X-†-Y- X = Arg, Lys Y = nonspecific	23.8	7.5-8.5	14.3	BAEE Casein TAME	Ca ²⁺ Lanthanide	Aprotinin, Benzamidine DFP, EDTA, Leupeptin α ₂ -macroglobulin PMSF, TLCK Trypsin Inhibitors (egg white, lima bean, pancreatic, soybean)	TRSEQII, Sequencing Grade, Native, Peptide mapping & sequence analysis
Trypsin, TPCK Treated								TRTPCK, TPCK Treated, Peptide mapping & sequence analysis Cleavage fusion proteins

Worthington Protease Products, Specifications and Applications Table

Enzyme	Specificity	Molecular Weight KDa	pH Optimum	Extinction Coefficient E1%, 280nm	Common Substrates	Activators	Inhibitors	Product Code/ Applications
Partially Purified for Tissue Dissociation and Protein Digestion								
Collagenase	-Pro-X-†-Gly-Pro-Y- X = neutral Y = nonspecific	68-130	6.3-7.5	13.20 (ColH, Theoretical) 13.40 (ColG, Theoretical)	Collagen FALGPA Wünsch	Ca ²⁺ , Zn ²⁺	α2-macroglobulin Cysteine, histidine DTT, 2-mercapto EDTA, EGTA Hg ²⁺ & other heavy metal ions o-phenanthroline	Collagenase products Tissue dissociation/ Primary cell isolation applications (see Tissue Dissociation Guide for specific references)
Elastase	Elastin, -X-†-Y- X = uncharged, nonaromatic Y = nonspecific	25.9	8.0-8.5	21.8 (Theoretical)	Casein Denatured collagen Elastin, Fibrin Suc-Ala3-NA	None required	α-antitrypsin DFP α2-macroglobulin PMSF	ES/ESL, suspension/lyo powder, Tissue Dissociation/ Primary cell isolation applications (see Tissue Dissociation Guide for specific references)
Neutral Protease (Dispase®)	-X-†-Leu/Phe-†-Y- X/Y = nonspecific	36.0	5.9-7.0	13.96 (Theoretical)	BAEE Casein	Ca ²⁺ , Mg ²⁺ , Mn ²⁺ , Fe ²⁺ , and Al ³⁺	EDTA, EGTA Hg ²⁺ & other heavy metal ions o-phenanthroline	NPRO/NPRO2 , Tissue Dissociation/ Primary cell isolation and cell harvesting applications (see Tissue Dissociation Guide for specific references)
Papain	-X-†-Y- X = nonspecific but Arg, Lys and Phe preferred Y = nonspecific	23.0	6.0-7.0	22.88 (Theoretical)	BAEE	Cysteine EDTA Reducing agents GSH, NBS	AESF, Antipain Cystatin, Leupeptin α2-macroglobulin Hg ²⁺ & other heavy metal ions DFP, PMSF TLCK, TPCK, E-64	PAP/PAPL , suspension/lyo powder, Neural tissue dissociation/ primary cell isolation applications (see Tissue Dissociation Guide for specific references) Antibody cleavage RBC modification
Pepsin	-X-†-Y- X = nonspecific but aromatic & hydrophobic preferred Y ≠ Ala, Gly, Val	34.6	1.0-4.0 unstable ≥5	14.39 (Theoretical)	Casein Hemoglobin	None required	Pepstatin A Diazoketones Epoxides	PM , Collagen bioprocessing/ purification Antibody cleavage
Proteinase K	-X-†-Y- X = nonspecific but aliphatic, aromatic & hydrophobic preferred Y = nonspecific	28.9	7.5-12	12.6 (Theoretical)	Casein Hemoglobin Keratin	Ca ²⁺ Active in 0.5-1% SDS	DFP EGTA PMSF	PROK, PROKS , DNA/RNA purification
Trypsin	-X-†-Y- X = Arg, Lys Y = nonspecific	23.8	7.5-8.5	14.3	BAEE Casein TAME	Ca ²⁺ Lanthanide	Aprotinin, Benzamidine DFP, EDTA, Leupeptin α2-macroglobulin PMSF, TLCK Trypsin Inhibitors (LBI, OI, SI/SIC)	Trypsin products Protein Digestion/ Sequencing (purified) Tissue dissociation/ Primary cell isolation applications (see Tissue Dissociation Guide for specific references)

Ordering Information

Worthington provides various options to make ordering fast and convenient:

- **Call:** 1.800.445.9603 (8am – 5:30pm EST Mon. – Fri.)
1.732.942.1660
- **Fax:** 1.800.368.3108
1.732.942.9270 (24hr/day, 7 days/week)
- **E-mail:** custservice@Worthington-Biochem.com
techservice@Worthington-Biochem.com
- **Online/Website:** Worthington-Biochem.com
TissueDissociation.com
- **Write:** Worthington Biochemical Corporation
730 Vassar Avenue
Lakewood, New Jersey 08701 U.S.A

Terms of Sale

Prices effective January, 2021 and are subject to change without notice. Additional charges added for shipping, which will be prepaid and added to the invoice unless other arrangements are made at the time of ordering. Insurance will be charged for higher-value shipments at our discretion.

Payment terms are Net 30 Days, F.O.B. Origin, Lakewood, New Jersey USA, payable in US dollars. All checks must be drawn on a US bank or payment made by wire transfer. Past due accounts may be charged a 1.5% per month late payment fee.

Complete Standard Terms and Conditions of Sale available on our website.

VISA, MasterCard & American Express are also accepted.



Discounts

Quantity Discounts

<i>Quantity</i>	<i>Price</i>
1 to 4	List Price
5 to 9	5% off list
10 to 19	10% off list
20 or more	15% off list
Bulk	Inquire

Standing Orders & Additional Discounts

For orders of greater than 25 packages, or orders of material packed in bulk, contact your representative or the Bulk Sales Office for special pricing consideration. Standing orders may also qualify for discounts. We welcome long-term use projections for which we can consider special rates. Large institutional buyers should contact their representative regarding special purchasing agreements.

Bulk, Contract/Custom & OEM Enzyme Purchasing

As a primary manufacturer, Worthington can supply products in a wide range of purity and activity specifications and in large-scale bulk quantities at substantial discounts. In addition, we welcome inquiries for contract and custom manufacturing, custom analysis, and special packaging for OEM applications. Several products are listed as Bulk Only in this catalog due to limited availability. Please contact Customer Service or our Bulk Sales Office to discuss your specific requirements.

Complete Standard Terms and Conditions of Sale available on our website.

Technical Service

**Available 8:00 AM to 5:00 PM Eastern Time Monday through Friday.
We can be contacted 24 hours a day by fax, e-mail or through
our website.**

Worthington makes the products we sell and welcome your questions and suggestions. Because we are a primary manufacturer we have ready access to all production and quality control records of our products by lot number.

Our years of experience in enzyme purification put us in a position to assist individual researchers with special needs. We frequently do customized preparations of entirely new products. We can make modifications of a regular production procedure on a custom basis. Furthermore, our quality control department can do special testing if needed.



*Need help with protocols?
Ask a representative how we can
help update you with our latest
technical tools.*

Online Sampling Program

Our position as the principal manufacturer of research grade collagenase makes possible our Collagenase Sampling Program. Under the program, we provide 100 mg samples of up to three different lots of collagenase for evaluation in your own cell isolation systems. A period of 60 days is allowed for your evaluation of these samples. A minimum of 3 grams of each lot of collagenase will be placed on HOLD, reserved in your name. When you determine which lot performs best for you, specify the lot desired when ordering. The only requirement, once a suitable lot of collagenase is found, is that you purchase a minimum of 3 grams of the material.

There is no charge for participating in the Collagenase Sampling Program.

**Contact your representative or our Technical Service group for more information:
techservice@Worthington-Biochem.com.**

Collagenase Lot Selection Tool

Worthington's Collagenase Lot Selection Tool is available online at our website. This feature was designed to help researchers select and evaluate current collagenase lots that match previous lots or desired activity profiles. Users may enter target values for collagenase, caseinase, clostripain, and tryptic activities or specify previous lot numbers. Each value can be weighted based on the relative level of importance to the application. After the search for matches is completed, a ranked list of collagenase lots currently available is generated. The selected lots can then be sampled simply by using the built-in link to the Free Collagenase Sampling Program. As always, Worthington Customer and Technical Service personnel are available via phone and e-mail to assist with collagenase or any other products.

ISO 9001 Certified Quality Management System

Worthington Biochemical Corporation is company-wide ISO9001 certified and operates according to GMP guidelines. Our initial ISO assessment audit was performed by ANAB-accredited SGS US Testing Company, Systems & Services Certification in 2005 with continuous successful re-certifications.

Product Use

All Worthington products are sold for manufacturing, research, and laboratory use only by properly trained and authorized personnel. Researchers and clinical laboratory personnel intending to use any of these products for medical investigation on humans are solely responsible for such use, and for compliance with the pertinent regulations of the United States Food & Drug Administration (USFDA) and other regulations. We do not assume liability for damages resulting from the use of these products or from their use in violation of patent or other rights.

U.S.D.A. Certified Raw Materials

All products from animal sources are produced from starting materials of United States Department of Agriculture (USDA) or equivalent approved origin, collected in USDA or equivalent approved facilities, inspected to be free of disease and suitable for exportation. Certificates of Origin are available upon request.

Animal Free Products

Several Animal Free (AF) nucleases, proteases and other products are also available to eliminate BSE/TSE and mammalian viral risks. Please inquire. All animal free products are designated with this symbol for ease of use.



Product Returns

Authorization for any product return must be obtained from Worthington Biochemical Corporation (Customer Service Department), or its authorized representative, prior to the return of product. This authorization is required to insure the proper return of material and, if applicable, the correct issuance of credit. There is no provision for credit of misused, improperly stored or outdated material. Product(s) must be returned in the same condition as received within 30 days of the original shipment by Worthington Biochemical Corporation. A restocking fee may be charged.

Complete Standard Terms and Conditions of Sale available on our website.

Online Resources

Hundreds of pages of technical, product and reference information are available online at: Worthington-Biochem.com

Worthington Enzyme Manual
Tissue Dissociation Guide
Catalog and Price List
Online Collagenase Lot Selection Tool

Additional Features

Complete Searchability
Current Collagenase Lot Availability and Activities
Online Ordering and Technical Service
Updated Announcements and Exhibit Schedules
International Distributor Listing
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Addressing your individual needs, we value every customer interaction. Let us know how we are doing.

Phone: 800.445.9603 • 732.942.1660 • Fax: 800.368.3108 • 732.942.9270
Worthington-Biochem.com
ISO9001 Certified

Name	Activity	Catalog Number	Package	Code
Australia:		China:		
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Sellex Email: vendas@sellex.com Website: www.sellex.com		Shanghai Universal BioTech Co., Ltd. Email: purchasing@univ-bio.com Website: www.univ-bio.com		
Sinapse Biotecnologia Ltda Website: www.sinapsebiotecnologia.com.br		Denmark:		
Canada: <i>Canadian Customers may contact us directly:</i> Worthington Biochemical Corporation 730 Vassar Avenue Lakewood, NJ 08701, USA Telephone: 800-445-9603 Fax: 800-368-3108 Email: office@worthington-biochem.com Website: www.worthington-biochem.com		BioNordika (Denmark) A/S Email: info@bionordika.dk Website: www.bionordika.dk		
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Name	Activity	Catalog Number	Package	Code
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Name	Activity	Catalog Number	Package	Code
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Email: international@Worthington-Biochem.com

Our Driving Force is Quality

The energy that drives all Worthington employees is the deep commitment to consistently produce superior quality products while providing personal service.

Our ISO9001 certified enzyme manufacturing facility and proprietary processes are designed specifically for the life science community, bioprocessing and OEM/private label business partners. We are proud to be a primary producer with over 90% of our products manufactured at our core facility located in Lakewood, New Jersey, USA.

Value Verified



ISO9001 Certified Quality Management System
All Processes Fully Documented and Traceable from Raw Materials through Final Shipment



Primary Producer For Biotech, Life Science Research, Diagnostic, Biopharmaceutical and Bioprocessing
Respected Manufacturer of High Quality, Lot-to-Lot Consistent Enzymes for Over 70 Years



Multi-Scale Extraction, Fermentation, Protein Purification, Lyophilization and Packaging Capabilities Produced Under GMP Guidelines
Internal Testing Capabilities include Enzyme, Protein, and Related Biochemical Analysis and Characterization



Animal-Free Certified and USDA Approved Animal-Sourced Products Suitable for Worldwide Exportation



Flexible and Responsive Production Scheduling
Sample Lots and Bulk Inventories Available for Immediate Shipment



Superior Customer Services and Technical Support — Before, During and After Sale
Volume Purchases, Bulk Packaging, Standing Orders, OEM/Supply Agreements, and Special Arrangements



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