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L-Ergothioneine

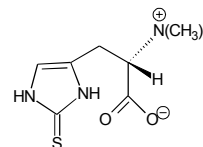
26511
26524

For Research Use Only, Not Intended For Use in Diagnostic Procedures

Catalog Number 26511 - 100 mg
 26524 - 250 mg

L-Ergothioneine is a natural thiol antioxidant which has been reported to have a number of different functions. It is present in tissues which are subject to high oxidative stress including the lens of the eye, the liver and red blood cells. It has been reported to block lipid peroxidation and protect against γ , UV radiation and singlet oxygen *in vitro*.

Form: White crystalline
Packaging Size: 100 mg and 250 mg
Source: Synthetic
CAS Number: 497-30-3
Formula Weight: 229.3
Molecular Formula: $C_9H_{13}N_3O_2S$
Purity: >98% (HPLC)
Storage and Stability: Refrigerate. This product is stable for 1 year as supplied; storage and stability studies are ongoing.
References: Hartman, P.E. 1990. *Meth. Enzy.* 186, 310-318.



U.S. Patent No. 5,438,151

NOTES:

Bioxytech® Cellular Glutathione Peroxidase Control

27617

*Control for Glutathione Peroxidase Enzyme Assay***Catalog Number** 27617**For Research Use Only, Not Intended For Use in Diagnostic Procedures**

This companion product to the Bioxytech® GPx-340 Assay System enables investigators to assess the performance of the assay, assess recovery of enzyme activity in biological samples and normalize measured glutathione peroxidase (GPx) activity.

Contents:

- GPx control (2 vials, minimum 2500 mU/mL)
- Diluent

Storage and Stability: Freeze. This product is stable for six months from date of manufacture when stored frozen.

Bioxytech® Glutathione Reductase Control

27618

*Control for Glutathione Reductase Enzyme Assay***Catalog Number** 27618**For Research Use Only, Not Intended For Use in Diagnostic Procedures**

This companion product to the Bioxytech® GR-340 Assay System enables investigators to assess the performance of the assay, assess recovery of enzyme activity in biological samples and normalize measured glutathione reductase (GR) activity.

Contents:

- GR control (2 vials, minimum 200 mU/vial)
- Diluent

Storage and Stability: Freeze. This product is stable for six months from date of manufacture when stored frozen.

Bioxytech® Cu/Zn SOD Control

27619

*Control for Cu/Zn SOD***Catalog Number** 27619**For Research Use Only, Not Intended For Use in Diagnostic Procedures**

This companion product to the Bioxytech® SOD-525 Assay System enables investigators to assess the performance of the assay, assess recovery of enzyme activity in biological samples and normalize measured superoxide dismutase (SOD) activity. This control can also be used with other methodologies.

Kit Contents: Cu/Zn SOD Control; 5 mg, minimum 3000 U/mg protein (McCord-Fridovitch).

Storage and Stability: Freeze. This product is stable for at least one year from date of manufacture when stored frozen.

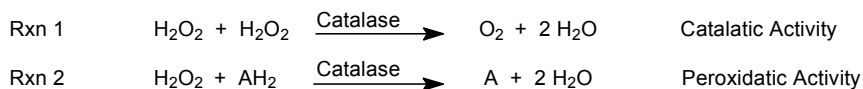
Bioxytech® Catalase Control (*Aspergillus Niger*)

27622

For Research Use Only, Not Intended For Use in Diagnostic Procedures

Catalog Number 27622

Catalase (EC 1.11.1.6, 2 H₂O₂ oxidoreductase) is a widely distributed enzyme that destroys hydrogen peroxide by dismutation (catalatic activity, Rxn 1) and also demonstrates peroxidatic activity (Rxn 2) (1,2). Hydrogen peroxide, a reactive oxygen species (ROS), is a toxic product of both normal aerobic metabolism and pathogenic ROS production. In the peroxidatic reaction, low molecular weight alcohols can serve as electron donors. The physiological significance of the peroxidatic activity of catalase is controversial (2).



Eukaryotic catalases are heme enzymes but a manganese catalase has been described from prokaryotes (2). In humans, the highest levels of catalase are found in liver, kidney, and erythrocytes, where it is believed to account for the majority of hydrogen peroxide decomposition. Eukaryotic catalases bind NADPH, which stabilizes the enzyme and prevents the formation of Compound II, a form of catalase outside the normal catalytic cycle (3). Acatalasemia is a rare inherited condition in which there is little or no catalase produced (4,5). It is found most commonly in Asian populations, although European and other cases have been reported. Acatalasemic individuals occasionally present with oral ulcers (Takahara's Disease), but the condition is largely asymptomatic. Studies of a mouse model of acatalasemia have demonstrated the importance of catalase in preventing methemoglobin formation in erythrocytes (6).

Catalase Control Method

- Contents:
- Control Diluent Surfactant in Phosphate Buffer, 30 mL.
 - Control Catalase, ≥ 200 U/vial, lyophilized, 2 vials.
- Items Required But NOT Provided:
- Deionized water.
 - Adjustable pipettes with disposable pipette tips.
- Control Preparation:
- Reconstitute the lyophilized contents of a Control vial with deionized water according to the vial label. See the Control vial label for the concentration of the resulting solution. Further dilute the Control with the provided Control Diluent to concentrations relevant to the study. Reconstituted and diluted catalase controls are stable for one week when stored at 4°C.

References

1. Deisseroth A, Dounce AL (1970) Catalase: Physical and Chemical Properties, Mechanism of Catalysis, and Physiological Role, *Physiol. Rev.* 50, 319-375.
2. Zamocky M, Koller F (1999) Understanding the Structure and Function of Catalases: Clues from Molecular Evolution and In Vitro Mutagenesis, *Prog. Biophys. Mol. Biol.* 72, 19-66.
3. Kirkman HN, et al., (1987) The Function of Catalase-bound NADPH, *J. Biol. Chem.* 262, 660-666.
4. Aebi H, Suter H (1971) Acatalasemia, *Adv. Human Genet.* 2, 143-199.
5. Ogata M (1991) Acatalasemia, *Human Genet.* 86, 331-340.
6. Wakimoto M, et al., (1998) Determination of Glutathione Peroxidase Activity and Its Contribution to Hydrogen Peroxide Removal in Erythrocytes, *Acta Med. Okayama* 52, 233-237.

Anti-Myeloperoxidase

24310

Mouse Anti-human MPO Monoclonal Antibody

Catalog Number	24310	For Research Use Only, Not Intended For Use in Diagnostic Procedures
Description:	Physiology and pharmacology of human PMN cells (neutrophils/secondary granules).	
Source:	Mouse	
Specificity:	<3% cross-reactivity with eosinophil peroxidase	
Form:	Liquid; Purity: >98%	
Packaging Size:	500 µg	
Storage and Stability:	Refrigerate. This product is stable for 1 year as supplied.	

Anti-Lactoferrin

24311

Mouse Anti-human Lf Monoclonal Antibody

Catalog Number	24311	For Research Use Only, Not Intended For Use in Diagnostic Procedures
Description:	Physiology and pharmacology of human PMN cells (neutrophils/secondary granules).	
Source:	Mouse	
Specificity:	Human lactoferrin	
Form:	Liquid; Purity: >98%	
Packaging Size:	500 µg	
Storage and Stability:	Refrigerate. This product is stable for 1 year as supplied.	

Anti-Nitrotyrosine

24312

Sheep Anti-NT Polyclonal Antibody

Catalog Number:	24312	For Research Use Only, Not Intended For Use in Diagnostic Procedures
Description:	Indication of peroxynitrite modification of proteins/oxidative stress	
Source:	Sheep	
Specificity:	Unmodified Human Serum Albumin: <ul style="list-style-type: none"> • No significant binding with EIA • No signal in Western blot (at 1/5 dilution) Nitrated Human Serum Albumin: <ul style="list-style-type: none"> • 1/2 saturation at 1/30,000 dilution neat antibody in EIA (1 µg/mL antigen plated) • Binding of antibody completely blocked by 1 mM 3-nitrotyrosine • Optimal dilution in Western blotting of (1/100) • Western blot signal blocked by 1 mM 3-nitrotyrosine 	
Form:	Plasma diluted 1:1 with PBS/0.01% thimerasol and 0.2 µm filtered.	
Packaging Size:	1500 µL	
Storage and Stability:	Freeze. This product is stable for 2 years as supplied.	

Anti-Catalase

24316

Rabbit Anti-Human Catalase Polyclonal Antibody

Catalog Number	24316	For Research Use Only, Not Intended For Use in Diagnostic Procedures
Description:	IgG fraction	
Buffer:	Phosphate buffered saline	
Source:	Rabbit	
Specificity:	Single arc by immunoelectrophoresis (IEP) vs. human red cell lysate. Single arc by IEP vs. 10 mg human erythrocyte catalase.	
Form:	Liquid Preservative: 0.1% NaN ₃	
Usage:	Radial immunodiffusion (RID). Working Concentration: 455 mg of antigen precipitated per mL of antiserum. Avoid freeze/thaw cycles.	
Packaging Size:	1000 µL	
Storage:	Freeze	

Anti-Cytochrome P450 2E1

24317

Rabbit Anti-Human P450 2E1 Polyclonal Antibody

Catalog Number	24317	For Research Use Only, Not Intended For Use in Diagnostic Procedures
Source:	Rabbit. Immunogen: Recombinant human P450 2E1 expressed in E. coli.	
Specificity:	By Western blot, recognizes a band (P450 2E1) in human liver microsomes. Only slightly cross-reacts with recombinant human P450 1A1 after prolonged incubation. Does not cross-react with recombinant human cytochromes P450 1A2, 3A4 or 2C10.	
Form:	Liquid. Purified rabbit IgG. Preservative: 0.05% NaN ₃	
Usage:	A dilution of 1:1000 for Western blots will yield a positive result with ≥0.2 mg of recombinant human cytochrome P450 2E1 using alkaline phosphatase-conjugated anti-rabbit IgG as second ary antibody. Concentration: 5 mg/mL in 20 mM phosphate buffer, pH 8.0. Avoid freeze/thaw cycles.	
Packaging Size:	100 µL	
Storage:	Freeze	
Reference:	Gillarm, E.M., et al. 1994. Arch. Biochem. Biophys. 312, 59.	

Anti-Cytochrome P450 3A4

24318

Rabbit Anti-Human P450 3A4 Polyclonal Antibody

Catalog Number	24318	For Research Use Only, Not Intended For Use in Diagnostic Procedures
Source:	Rabbit. Immunogen: Recombinant human P450 3A4 expressed in E. coli.	
Specificity:	By Western blot, reacts with human recombinant P450 3A4 and with P450 3A4 in human liver microsomes.	
Form:	Liquid. Purified rabbit IgG. Preservative: 0.05% NaN ₃	
Usage:	A dilution of 1:1000 for Western blots will yield a positive result with ≥0.2 mg of recombinant human cytochrome P450 3A4 using alkaline phosphatase-conjugated anti-rabbit IgG as secondary antibody. Avoid freeze/thaw cycles.	
Packaging Size:	100 µL	
Storage:	Freeze	

Anti-Glutathione S-Transferase A1-1

24319

*Rabbit Anti-Human GST A1-1 Polyclonal Antibody***For Research Use Only, Not Intended For Use in Diagnostic Procedures**

Catalog Number	24319
Description:	Polyclonal antibody produced by immunizing rabbits with recombinant human GST A1-1, expressed in <i>E. coli</i> (Cat. No. 25434).
Source:	Rabbit
Specificity:	Specific for the α -form of human and rat GST. Reacts with recombinant human GST A1-1. Does not react with μ or π GST's.
Form:	Liquid. Undiluted serum. Preservative: 0.05% NaN ₃
Usage:	Immunoblotting. A dilution of 1/1000 will yield a positive result with ≥ 0.2 mg of human A1-1 GST, using alkaline phosphatase-conjugated anti-rabbit IgG as secondary antibody. Avoid freeze/thaw cycles.
Packaging Size:	100 μ L
Storage:	Freeze
Reference:	Holmes, W., et al. 1990. <i>Br. J. Cancer</i> 62, 209.

Anti-Glutathione S-Transferase M1-1

24320

*Rabbit Anti-Human GST M1-1 Polyclonal Antibody***For Research Use Only, Not Intended For Use in Diagnostic Procedures**

Catalog Number	24320
Description:	Polyclonal antibody produced by immunizing rabbits with recombinant human GST M1-1, expressed in <i>E. coli</i> (Cat. No. 25435).
Source:	Rabbit
Specificity:	Specific for the μ -form of human and rat GST. Reacts with recombinant human GST M1-1. Does not react with α or π GST's.
Form:	Liquid. Undiluted serum. Preservative: 0.05% NaN ₃
Usage:	Immunoblotting. A dilution of 1/1000 will yield a positive result with ≥ 0.2 mg of human M1-1 GST, using alkaline phosphatase-conjugated anti-rabbit IgG as secondary antibody. Avoid freeze/thaw cycles.
Packaging Size:	100 μ L
Storage:	Freeze
Reference:	Holmes, W., et al. 1990. <i>Brit. J. Cancer</i> 62, 209.

Anti-Glutathione S-Transferase P1-1

24321

*Rabbit Anti-Human GST P1-1 Polyclonal Antibody***For Research Use Only, Not Intended For Use in Diagnostic Procedures**

Catalog Number	24321
Description:	Polyclonal antibody produced by immunizing rabbits with recombinant human GST P1-1, expressed in <i>E. coli</i> (Cat. No. 25436).
Source:	Rabbit
Specificity:	Specific for the π -form of human and rat GST. Reacts with recombinant human GST P1-1. Does not react with α or μ GST's.
Form:	Liquid. Undiluted serum. Preservative: 0.05% NaN ₃
Usage:	Immunoblotting. A dilution of 1/1000 will yield a positive result with ≥ 0.2 mg of human P1-1 GST, using alkaline phosphatase-conjugated anti-rabbit IgG as secondary antibody. Avoid freeze/thaw cycles.
Packaging Size:	100 μ L
Storage:	Freeze
Reference:	Holmes, W., et al. 1990. <i>Br. J. Cancer</i> 62, 209.

Anti-Cu/Zn - Superoxide Dismutase

24322

*Sheep Anti-Human Cu/Zn-SOD Polyclonal Antibody***For Research Use Only, Not Intended For Use in Diagnostic Procedures****Catalog Number** 24322

Superoxide dismutase Cu/Zn enzyme (Cu/Zn SOD) is a homodimeric metalloenzyme of aerobic organisms, comprised of subunits of approximately 16 kDa. Found in a variety of cell types, including erythrocytes, liver, and brain, it serves to protect cells against the oxidative damage of free radicals by catalyzing the conversion of superoxide anions (O_2^-) to molecular oxygen (O_2) and hydrogen peroxide (H_2O_2). This anti-Cu/Zn SOD polyclonal antibody is supplied as an IgG fraction obtained by DEAE ion-exchange chromatography.

Source: Sheep
Immunogen: Highly purified Cu/Zn SOD enzyme from human erythrocytes
Specificity: Monospecific as determined by immunoelectrophoresis against human red blood cell lysate. Confirmed by immunodiffusion vs. a human red blood cell lysate and a known anti-Cu/Zn SOD antibody. No cross-reactivity with Mn SOD by double diffusion or with human serum.
Form: Liquid, passed through a 0.2 μ m filter. Buffer: Glycine-buffered saline, pH 7.4. Preservatives: 0.1% NaN_3 , 0.1% ϵ -amino-n-caproic acid, 0.01% benzamidine, 1 mM EDTA.
Usage: Immunohistochemistry, 1:20–1:200; Immunoblotting: 1:1000 Avoid freeze/thaw cycles.
Packaging Size: 1000 μ L
Storage: Freeze

Anti-Mn Superoxide Dismutase

24323

*Sheep Anti-Human Mn-SOD Polyclonal Antibody***For Research Use Only, Not Intended For Use in Diagnostic Procedures****Catalog Number** 24323

Superoxide dismutase enzyme Mn SOD is a homotetrameric metallo enzyme of aerobic organisms, comprised of subunits of approximately 25 kDa. Localized primarily in the mitochondria, it serves to protect cells against the oxidative damage of free radicals by catalyzing the conversion of superoxide anion (O_2^-) to molecular oxygen (O_2) and hydrogen peroxide (H_2O_2). This anti-SOD (Mn) polyclonal antibody is supplied as an IgG fraction prepared by DEAE ion-exchange chromatography.

Source: Sheep
Immunogen: Highly purified Mn SOD enzyme from human liver
Specificity: Monospecific as determined by immunoelectrophoresis against a human liver cell lysate. No cross-reactivity with SOD (Cu/Zn) by double diffusion or with human serum.
Form: Liquid, passed through a 0.2 μ m filter. Preservatives: 0.1% NaN_3 , 0.1% ϵ -amino-n-caproic acid, 0.01% benzamidine, 1 mM EDTA. Buffer: Glycine buffered saline, pH 7.4
Usage: Immunohistochemistry, 1:20–1:200. Avoid freeze/thaw cycles.
Packaging Size: 1000 μ L
Storage: Freeze

Anti-4-Hydroxy-2-nonenal

24325

24327

*Mouse Anti-4-HNE Monoclonal Antibody***For Research Use Only, Not Intended For Use in Diagnostic Procedures**

Catalog Number	24325 - 100 µg/vial (lyophilized) 24327 - 20 µg/vial (lyophilized)
Source:	Mouse (IgG1)
Immunogen:	4-HNE-modified keyhole limpet hemocyanine. Use Immunohistochemistry, Western blotting Dilution: 25 µg/mL for Immunohistochemistry, 15 µg/mL for Western blotting
Form:	Each vial contains 100µg (20 µg) of Anti-4-HNE monoclonal antibody. If dissolved in 1 mL (0.2mL) of distilled water, the composition of the solution will be 100 µg/mL with 0.05M TBS containing 1% BSA
Specificity:	This antibody shows negligible reactivity with proteins that were treated with other aldehydes such as: 2-nonenal, 2-hexenal, 1-hexenal, 4-hydroxy-2-hexenal, formaldehyde or glutaraldehyde.
Storage:	Store at <4°C
Stability:	3 years at -20°C

Anti-8-Hydroxy-2'-deoxyguanosine

24326

24328

*Mouse Anti-8-OHdG Monoclonal Antibody***For Research Use Only, Not Intended For Use in Diagnostic Procedures**

Catalog Number	24326 - 100 µg/vial (lyophilized) 24328 - 20 µg/vial (lyophilized)
Source:	Mouse (IgG1)
Immunogen:	8-OHdG conjugated keyhole limpet hemocyanin. Use Immunohistochemistry Dilution 5-10 µg/mL
Form:	Each vial contains 100µg (20 µg) of Anti-8-OHdG monoclonal antibody. If dissolved in 1 mL (0.2mL) of distilled water, the composition of the solution will be 100 µg/mL with 0.05M TBS containing 1% BSA
Specificity:	21 Analogues of 8-OHdG were examined with only two exhibiting mild cross-reactivity. 8-sulfhydrylguanosine and 8-OHG demonstrate some cross-reactivity at high concentrations (at least 2 orders of magnitude were required for positive cross-reactivity).
Storage:	Store at <4° C
Stability:	3 years at -20° C

Anti-Endothelial Nitric Oxide Synthase

25310

*Rabbit anti Bovine eNOS Polyclonal Antibody***For Research Use Only, Not Intended For Use in Diagnostic Procedures****Catalog Number** 25310

The antibody recognizes endothelial nitric oxide synthase (eNOS, 140 kDa) protein in human, rat and mouse. The immunogen used was a bovine eNOS synthetic peptide (599–613) plus C-terminal Cys (PYNSSPRPEQHKSYSKC) conjugated to KLH. No cross-reactivity to iNOS or bNOS.

Source:	Rabbit
Form:	Undiluted serum. Preservative: 0.02% NaN ₃
Usage:	1:250 in immunocytochemistry; 1:1,000 in Western blotting. Avoid freeze/thaw cycles.
Packaging Size:	100 µL
Storage:	Freeze

Anti-Inducible Nitric Oxide Synthase

25311

*Rabbit anti Mouse iNOS Polyclonal Antibody***For Research Use Only, Not Intended For Use in Diagnostic Procedures****Catalog Number** 25311

This antibody recognizes inducible nitric oxide synthase (iNOS, 130 kDa) protein in human, rat and mouse. The immunogen used was mouse macrophage NOS C-terminal peptide (1131–1144) plus N-terminal Cys (CKKGSALEEPKATRL) conjugated to KLH. Exhibits no cross-reactivity with bNOS or eNOS.

Source: Rabbit
 Form: Undiluted serum. Preservative: 0.02% NaN₃
 Usage: 1:500 in immunocytochemistry; 1:500 in immunohistochemistry; 1:2,000 in Western blotting. Avoid freeze/thaw cycles.
 Packaging Size: 100 µL
 Storage: Freeze

Anti-Brain Nitric Oxide Synthase

25312

*Rabbit anti Rat bNOS Polyclonal Antibody***For Research Use Only, Not Intended For Use in Diagnostic Procedures****Catalog Number** 25312

The antibody recognizes brain nitric oxide synthase (bNOS, 155 kDa) protein in bovine, primates, mouse and rat. The immunogen used was a rat bNOS synthetic peptide (724–739) corresponding to the calmodulin-binding domain, plus C-terminal Cys (TKRRAIGFKLAFAVKK) conjugated to KLH. Exhibits no cross-reactivity to iNOS or eNOS.

Source: Rabbit
 Form: Undiluted serum. Preservative: 0.02% NaN₃
 Usage: 1:800 in immunohistochemistry; 1:1,000 in Western blotting. Avoid freeze/thaw cycles.
 Packaging Size: 100 µL
 Storage: Freeze

Bovine Cu/Zn Superoxide Dismutase (bSOD)

25447 25414
25415 25416

For Research Use Only, Not Intended For Use in Diagnostic Procedures

Catalog Number 25447 - 25 mg
25414 - 250 mg
25415 - 500 mg
25416 - 1 g

Bovine Cu/Zn SOD can be used in research as a reference for quantification of SOD activity in biological samples. It can also be used as a reference for quality control studies of substances which contain SOD activity.

Form: Lyophilized solid
Source: Bovine liver
Packaging Size: Various
Formula Weight: 32,500
Purity: >99%
Specific Activity: >3000 U/mg (McCord-Fridovitch)
Storage and Stability: Freeze. This product is stable for 1 year as supplied.

Catalase, *Aspergillus niger*

25430

For Research Use Only, Not Intended For Use in Diagnostic Procedures

Catalog Number 25430

Long-acting, extremely stable form of catalase that is active from pH 2–12. Composed of four protein subunits, each containing a heme (Fe³⁺-protoporphyrin) group bound to its active site. Each subunit also contains one molecule of bound NADPH that helps to stabilize the enzyme. Catalyzes the reaction $2\text{H}_2\text{O}_2 \rightarrow 2\text{H}_2\text{O} + \text{O}_2$. Catalase, along with superoxide dismutase and glutathione peroxidase, controls the level of oxygen-derived free radicals in mammalian cells, and together may function as a somatic oxidant defense. Prevents apoptosis in cultured rat ovarian follicles.

Form: Light brown lyophilized solid
Packaging Size: 100 KU
CAS Number: 9001-05-2
RTECS: F14378000
EC Number: 1.11.1.6
Formula Weight: 250,000
Specific Activity: 10 KU/mg protein
Activity: >4 KU/mg dry weight
Contaminants: Microbial contamination: ^50 cfu/g dry weight
Unit Definition: 1 KU = 1000 units. One unit is defined as the amount of enzyme that will decompose 1.0 μmol of H₂O₂ per minute at 30°C, pH 7.0.
Solubility: H₂O (20 mg/ml) and physiological buffers
Storage: Freeze. Following reconstitution, aliquot and refreeze for long term storage or store at room temperature for short term storage. This product is stable for 2 years as supplied. Aqueous stock solutions are stable for several weeks at room temperature or for several months frozen.
References: Tilly, J.L., and Tilly, K.I. 1995. *Endocrinology* 136, 242.
Kassim, E.A. 1982. *Microbiol. Immunol.* 26, 449.
Kikuchi-Torii, K., et al. 1992. *J. Biochem.* 92, 1149.
Beers, R.F., and Sizer, I.W. 1952. *J. Biol. Chem.* 195, 133.

Catalase, Bovine Liver

25431

For Research Use Only, Not Intended For Use in Diagnostic Procedures

Catalog Number 25431

Catalase, along with superoxide dismutase and glutathione peroxidase, controls the levels of oxygen-derived free radicals in mammalian cells. Together these molecules may function as a somatic oxidant defense. Prevents apoptosis in cultured rat ovarian follicles.

Form: Green lyophilized solid
 Packaging Size: 5 MU
 CAS Number: 9001-05-2
 RTECS: F14378000
 EC Number: 1.11.1.6
 Formula Weight: 247,000
 Specific Activity: 40,000 units/mg protein
 Activity: ≥ 5000 units/mg dry weight
 Unit Definition: 1 MU = 1,000,000 units. One unit is defined as the amount of enzyme that will decompose 1.0 μmol of H_2O_2 per minute at 25°C, pH 7.0.
 Solubility: H_2O and aqueous buffers
 Storage and Stability: Freeze. Protect from moisture. Following reconstitution, aliquot and refreeze. This product is stable for 2 years as supplied. Stock solutions are stable for at least 1 month when frozen.
 References: Tilly, J.L., and Tilly, K.I. 1995. *Endocrinology* 136, 242.
 Beers, R.F., and Sizer, I.W. 1952. *J. Biol. Chem.* 195, 133.

Catalase, Human Erythrocyte

25432

For Research Use Only, Not Intended For Use in Diagnostic Procedures

Catalog Number 25432

Catalase, along with superoxide dismutase and glutathione peroxidase, controls the levels of oxygen-derived free radicals in mammalian cells. Together these molecules may function as a somatic oxidant defense. Prevents apoptosis in cultured rat ovarian follicles.

Form: Liquid. Supplied in 50 mM Tris, pH 8.0.
 Source: Prepared from blood that has been tested to be negative for HBsAg and for HIV and HCV antibodies. It is recommended that the product be handled using established good laboratory practices since no test method can guarantee that products derived from human blood will not transmit infection.
 Packaging Size: 1 mg
 CAS Number: 9001-05-2
 RTECS: F14378000
 EC Number: 1.11.1.6
 Formula Weight: 256,000
 Purity: $\geq 95\%$ by SDS-Page
 Specific Activity: $>50,000$ units/mg
 Unit Definition: One unit is defined as the amount of enzyme that will decompose 1.0 μmol of H_2O_2 per minute at 25°C, pH 7.0.
 Storage and Stability: Freeze. Avoid freeze/thaw cycles. This product is stable for 2 years as supplied.
 References: Tilly, J.L., and Tilly, K.I. 1995. *Endocrinology* 136, 242.
 Bonaventura, J., et al. 1972. *Arch. Biochem. Biophys.* 150, 606.

Glutathione Reductase, Yeast

25433

GR

Catalog Number 25433

For Research Use Only, Not Intended For Use in Diagnostic Procedures

A ubiquitous enzyme that catalyzes the oxidation of oxidized glutathione (GSSG) to glutathione (GSH).

Form: Yellow crystalline suspension in 3.2 M (NH₄)₂SO₄, pH 6.0.
 Packaging Size: 600 U
 CAS Number: 9001-48-3
 EC Number: 1.6.4.2
 Formula Weight: 118,000
 Contaminants: NADPH oxidase and G-6-PDH: <0.01%; 6-PGDH: <0.1%
 Specific Activity: ≥ 100 units/mg protein
 Unit Definition: One unit is defined as the amount of enzyme that will hydrolyze 1.0 mmol of oxidized glutathione per minute at 25°C, pH 7.6.
 Solubility: Aqueous buffers.
 Storage and Stability: Refrigerate. Do not freeze. This product is stable for 1 year as supplied.
 Reference: Smith, I.K., et al. 1988. Anal. Biochem. 175, 408.

Glutathione-S-Transferase A1-1 Recombinant Human

25434

rhGST A1-1

Catalog Number 25434

For Research Use Only, Not Intended For Use in Diagnostic Procedures

Affinity purified, biologically active, full-length recombinant GST A1-1 that possesses physical and catalytic properties indistinguishable from the native enzyme. GSTs catalyze the formation of thioester conjugates between glutathione and reactive xenobiotic compounds and are believed to be important for the cellular response to oxidative stress. Suitable for pro-carcinogen activation studies.

Form: Liquid. Supplied in 50 mM Tris-HCl, pH 7.5, 50 mM NaCl, 1 mM DTT, 1 mM EDTA, and 50% glycerol.
 Packaging Size: 100 µg
 Formula Weight: 50,000
 Purity: >95% by SDS-PAGE
 Specific Activity: 50 units/mg protein
 Unit Definition: One unit is defined as the amount of enzyme that will conjugate 1.0 mmol of 1-chloro-2,4-dinitrobenzene (CDNB) to reduced glutathione per minute at 20°C, pH 6.5.
 Storage and Stability: Freeze. This product is stable for 1 year as supplied.
 References: Kolm, R.H., et al. 1995. Biochem. J. 311, 453.
 Kolm, R.H., et al. 1995. Protein Expr. Purif. 6, 265.
 Stenberg, G., et al. 1992. Protein Expr. Purif. 3, 80.
 Widersten, M., et al. 1991. Biochem. J. 276, 519.

Glutathione-S-Transferase M1-1 Recombinant Human

25435

rhGST M1-1

Catalog Number 25435

For Research Use Only, Not Intended For Use in Diagnostic Procedures

Affinity purified, biologically active, full length recombinant GST M1-1 that possesses physical and catalytic properties indistinguishable from the native enzyme. Corresponds to the type b allelic variant and GST Y purified from human liver. GSTs catalyze the formation of thioester conjugates between glutathione and reactive xenobiotic compounds and are believed to be important for the cellular response to oxidative stress. Suitable for procarcinogen activation studies.

Form: Liquid. Supplied in 50 mM Tris-HCl, pH 7.5, 50 mM NaCl, 1 mM DTT, 1 mM EDTA, and 50% glycerol.

Packaging Size: 100 µg

Formula Weight: 50,000

Purity: ≥ 95% by SDS-PAGE

Specific Activity: 100 units/mg protein

Unit Definition: One unit is defined as the amount of enzyme that will conjugate 1.0 mmol of 1-chloro-2,4-dinitrobenzene (CDNB) to reduced glutathione per minute at 20°C, pH 6.5.

Storage and Stability: Freeze. This product is stable for 1 year as supplied.

References: Kolm, R.H., et al. 1995. *Biochem. J.* 311, 453.
Kolm, R.H., et al. 1995. *Protein Expr. Purif.* 6, 265.
Stenberg, G., et al. 1992. *Protein Expr. Purif.* 3, 80.
Widersten, M., et al. 1991. *Biochem. J.* 276, 519.

Glutathione-S-Transferase P1-1 Recombinant Human

25436

rhGST P1-1

Catalog Number 25436

For Research Use Only, Not Intended For Use in Diagnostic Procedures

Affinity purified, biologically active, full length recombinant GST P1-1. GSTs catalyze the formation of the thioester conjugates between glutathione and reactive xenobiotic compounds and are believed to be important for the cellular response to oxidative stress. Suitable for procarcinogen studies. Higher levels of GST P1-1 are reported in many human tumors, including melanomas. GST P1-1 is widely distributed throughout the body, except for the liver.

Form: Liquid. Supplied in 50 mM Tris-HCl, pH 7.5, 50 mM NaCl, 1 mM DTT, 1 mM EDTA, and 50% glycerol.

Packaging Size: 100 µg

Formula Weight: 50,000

Purity: ≥ 95% by SDS-PAGE

Specific Activity: 75 units/mg protein

Unit Definition: One unit is defined as the amount of enzyme that will conjugate 1.0 mmol of 1-chloro-2,4-dinitrobenzene (CDNB) to reduced glutathione per minute at 20°C, pH 6.5.

Storage and Stability: Freeze. This product is stable for 1 year as supplied.

References: Kolm, R.H., et al. 1995. *Biochem. J.* 311, 453.
Stenberg, G., et al. 1992. *Protein Expression Purif.* 3, 80.
Widersten, M., et al. 1991. *Biochem. J.* 276, 519.

Myeloperoxidase, Human Polymorphonuclear Leukocytes

25437

MPO

Catalog Number 25437

For Research Use Only, Not Intended For Use in Diagnostic Procedures

A lysosomal heme protein that catalyzes oxidations by hydrogen peroxide, including MPO-chloride-mediated killing of microbes and tumor cells, inactivation of chemotactic factors, cross-linking of proteins, and iodination of proteins.

Form: Solid lyophilized from 50 mM sodium acetate, pH 6.0, and 100 mM NaCl.
 Packaging Size: 100 µg
 Source: Prepared from blood that tested negative for HBsAg and for HIV and HCV antibodies. It is recommended that this product be handled using established good laboratory practices since no test method can guarantee that products derived from human blood will not transmit infection.
 CAS Number: 9003-99-0
 EC Number: 1.11.1.7
 Formula Weight: 118,000
 Purity: ≥ 95% by SDS-Page
 Specific Activity: 50-200 units/mg protein
 Unit Definition: One unit is defined as the amount of enzyme that will hydrolyze 1.0 mmol of H₂O₂ per minute at 25°C, pH 6.0.
 Solubility: Reconstitute with 1 mL of 50 mM sodium acetate, pH 6.0, and 100 mM NaCl. Enzyme may precipitate out of solution in low ionic strength buffers or in distilled H₂O.
 Storage and Stability: Freeze. Following reconstitution, aliquot and refreeze at -20°C or below. This product is stable for 2 years as supplied. Stock solutions are stable for 6-12 months at -20°C or below.
 References: Panasenkov, O.M., et al. 1994. Free Radical Biol. Med. 16, 143.
 Mulligan, M.S., et al. 1992. Br. J. Pharmacol. 107, 1159.
 Sharonov, B.P., and Churilova, I.V. 1992. Biochem. Biophys. Res. Commun. 189, 1129.

Brain Nitric Oxide Synthase, Recombinant Rat

27510

bNOS

Catalog Number 27510

For Research Use Only, Not Intended For Use in Diagnostic Procedures

Constitutive rat brain NOS isoform. Produced by a baculovirus expression system in the presence of hemin. Useful for studies involving NOS regulation, inhibitor screening and kinetic analysis.

Form: Liquid. Supplied as 0.1 mg/ml in 50 mM triethanolamine-HCl, 10 mM β-mercaptoethanol, 1 mM CHAPS, 500 mM EDTA, pH 7.0.
 Packaging Size: 10 µg
 CAS Number: 125978-95-2
 EC Number: 1.14.13.39
 Formula Weight: 150,000
 Purity: ≥ 95% by SDS-PAGE
 Specific Activity: ≥ 500 nmol L-citrulline/mg/min at 37°C.
 Storage and Stability: Deep freeze. Avoid freeze/thaw cycles. After initial thawing, aliquot and refreeze (-70°C). This product is stable for 2 years as supplied.
 References: Nakane, M., et al. 1995. Biochem. Biophys. Res. Commun. 206, 511.
 Harteneck, C., et al. 1994. Biochem. J. 304, 683.
 Richards, M.K., and Marletta, M.A. 1994. Biochemistry 33, 14723.
 Charles, I.G., et al. 1993. Biochem. Biophys. Res. Commun. 196, 1481.

Constitutive Nitric Oxide Synthase Recombinant Rat Neuronal 27511

cNOS

Catalog Number 27511

For Research Use Only, Not Intended For Use in Diagnostic Procedures

Constitutive rat brain NOS isoform cNOS. Recombinant enzyme from the 100,000 x g supernatant of a baculovirus expression system. Useful for studies involving NOS regulation, inhibitor screening and kinetic analysis.

Form: Liquid. Supplied in 50 mM HEPES, pH 7.4, 100 mM DTT, and 10% glycerol.
Packaging Size: 50 U
Formula Weight: 150,000
Specific Activity: 35–80 units/mg protein
Unit Definition: One unit is defined as the amount of enzyme that will produce 1.0 nmol of nitric oxide per minute in the presence of calmodulin at 37°C, pH 7.5.
Storage: Deep freeze. Avoid freeze/thaw cycles. This product is stable for 1 year as supplied.
References: Abu-Soud, H.M., et al. 1994. J. Biol. Chem. 269, 32047.
 Abu-Soud, H.M., et al. 1994. J. Biol. Chem. 269, 32318.
 Richards, M.K., et al. 1994. Biochemistry 33, 14723.
 Sheta, E.A., et al. 1994. J. Biol. Chem. 269, 15147.

Constitutive Nitric Oxide Synthase Recombinant Human, High Purity 27512

cNOS

Catalog Number 27512

For Research Use Only, Not Intended For Use in Diagnostic Procedures

Constitutive rat brain NOS isoform. Catalyzes the production of nitric oxide (NO) by conversion of L-arginine to L-citrulline. Useful for studies involving NOS regulation, inhibitor screening and kinetic analysis.

Form: Liquid. Supplied In 20% glycerol, containing: 50 mM Hepes, 100 mM NaCl, and 10 mM tetrahydro-L-biopterin, at pH 7.4.
Source: Recombinant enzyme purified from a baculovirus expression system.
Packaging Size: 10 U
Formula Weight: 150,000
Purity: ≥ 95% by SDS-Page
Specific Activity: 800-1300 units/mg
Unit Definition: One unit is defined as the amount of enzyme that will produce 1.0 nmol of nitric oxide per minute in the presence of calmodulin at 37°C, pH 7.5.
Storage: Deep freeze (-70°C). Avoid freeze/thaw cycles.
Stability: This product is stable for 1 year as supplied.
References: Abu-Soud, H.M., et al. 1994. J. Biol. Chem. 269, 32047.
 Abu-Soud, H.M., et al. 1994. J. Biol. Chem. 259, 32318.
 Richards, M.K., et al. 1994. Biochemistry 33,14723.
 Sheta, E.A., et al. 1994, J. Biol. Chem. 269,15147.

Inducible Nitric Oxide Synthase, Mouse Macrophage

27513

*iNOS***For Research Use Only, Not Intended For Use in Diagnostic Procedures****Catalog Number:** 27513

Inducible mouse brain NOS isoform iNOS. Catalyzes the production of nitric oxide by conversion of L-arginine to L-citrulline. Useful for studies involving NOS regulation, inhibitor screening and kinetic analysis.

Form: Liquid. Supplied in 50 mM HEPES and 10% glycerol, pH 7.4.

Source: Recombinant enzyme from the 100,000 x g supernatant of immunostimulated murine macrophage (RAW 264.7 cells).

Packaging Size: 50 U

Formula Weight: 130,000

Specific Activity: 7 units/mg

Unit Definition: One unit is defined as the amount of enzyme that will produce 1.0 nmol of nitric oxide per minute at 37°C, pH 7.4.

Storage and Stability: Deep freeze. Avoid freeze/thaw cycles. This product is stable for 2 years as supplied.

References: Stevens-Truss, R., et al. 1995. *Biochemistry* 34, 15638.

Marletta, M.A., 1994. *J. Med. Chem.* 37, 1899.

White, K.A., et al. 1992. *Biochemistry* 31, 6627.

Hevel, J.M. et al. 1991. *J. Biol. Chem.* 266, 22789.

NOTES:

4-Hydroxy-non-2-enal-diethylacetal

26515

4-HNE-DEA

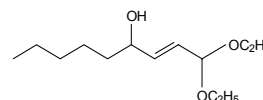
26516

26595

Catalog Number 26595 - 50 mg
26515 - 100 mg
26516 - 1.0 g

For Research Use Only, Not Intended For Use in Diagnostic Procedures

Description: A precursor to one of the major metabolites of lipid hydroperoxide degradation.
Form: Liquid
Source: Synthetic
Packaging Size: 10 mg, 100 mg, 1.0 g
CAS Number: 18445-69-7
Formula Weight: 230.3
Molecular Formula: $C_{13}H_{26}O_3$
Purity: $\geq 98\%$ (GC)
Storage and Stability: Freeze. This product is stable for 2 years when frozen.



4-Hydroxy-hex-2-enal-diethylacetal

26518

4-HHE-DEA

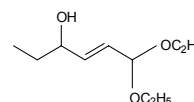
26519

26594

Catalog Number 26594 - 50 mg
26518 - 100 mg
26519 - 1.0 g

For Research Use Only, Not Intended For Use in Diagnostic Procedures

Description: A precursor to one of the major metabolites of lipid hydroperoxide degradation.
Form: Liquid
Source: Synthetic
Packaging Size: 10 mg, 100 mg, 1.0 g
CAS Number: 18445-66-4
Formula Weight: 188.3
Molecular Formula: $C_{10}H_{20}O_3$
Purity: $\geq 96\%$ (GC)
Storage and Stability: Freeze. This product is stable for 2 years when frozen.



8-Hydroxyguanosine

26525

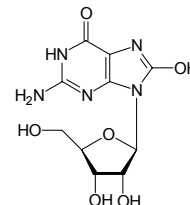
8-OHG

Catalog Number

26525

For Research Use Only, Not Intended For Use in Diagnostic Procedures

Description: Product of oxidative damage to RNA.
 Form: Crystalline solid
 Packaging Size: 1 mg
 CAS Number: 3868-31-3
 Formula Weight: 299.2
 Molecular Formula: $C_{10}H_{13}N_5O_6$
 Purity: $\geq 98\%$ by TLC
 Solubility: H_2O
 Storage and Stability: Refrigerate. This product is stable for 3 years as supplied.
 References: Takeuchi, T., and Morimoto, K. 1993. *Carcinogenesis* 14, 1115.
 Csillag, C., and Aldhous, P. 1992. *Science* 258, 1875.
 Mo, Y., et al. 1992. *Proc. Natl. Acad. Sci. USA* 89, 11021.



4-Hydroxy-2-nonenal

26526

4-HNE

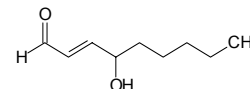
Catalog Number

26526

For Research Use Only, Not Intended For Use in Diagnostic Procedures

A major aldehydic product formed by peroxidation of ω -6-unsaturated fatty acids that is regarded as a specific marker of lipid peroxidation. Inhibits proliferation and induces differentiation of HL-60 human leukemic cells. Also induces cell death in murine alveolar macrophages. An inhibitor of state 3 respiration at micromolar levels that causes a transient increase in cytosolic Ca^{2+} . Irreversibly inhibits $Na^+-K^+-ATPase$ activity ($IC_{50} = 120$ mM).

Form: Liquid. Supplied in ethanol.
 Packaging Size: 1 mg
 CAS Number: 75899-68-2
 RTECS: RA8510000
 Formula Weight: 156.2
 Purity: $\geq 98\%$ by HPLC
 Molecular Formula: $C_9H_{16}O_2$
 Solubility: Ethanol
 Storage and Stability: Deep freeze. This product is stable for 3 years as supplied.
 References: Carini, R., et al. 1996. *Biochem. Biophys. Res. Commun.* 218, 772.
 Li, L., et al. 1996. *Toxicol. Appl. Pharmacol.* 139, 135. Siems, W.G., et al. 1996. *Free Radic. Res.* 20, 215.
 Ullrich, O., et al. 1996. *Free Radic. Res.* 24, 421. van Kuijk, F.J.G.M., et al. 1995. *Anal. Biochem.* 224, 420.
 Esterbauer, H., et al. 1991. *Free Radic. Biol. Med.* 11, 81.



3-Nitro-L-Tyrosine

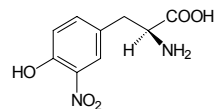
26527

Catalog Number 26527

For Research Use Only, Not Intended For Use in Diagnostic Procedures

A marker for peroxynitrite. A powerful oxidant and cytotoxic agent. Nitrotyrosine is the major product obtained by the nitration of tyrosine by peroxynitrite.

Form: Yellow-green solid
 Packaging Size: 1 g
 CAS Number: 621-44-3
 Formula Weight: 226.2
 Molecular Formula: $C_9H_{10}N_2O_5$
 Purity: $\geq 98\%$ by TLC



8-Hydroxy-2'-deoxyguanosine

26571

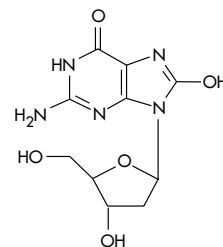
8-OHdG

Catalog Number 26571

For Research Use Only, Not Intended For Use in Diagnostic Procedures

Product of oxidative damage to DNA.

Form: Crystalline solid
 Packaging Size: 1 mg
 CAS Number: 88847-89-6
 Formula Weight: 283.2
 Solubility: H_2O
 Molecular Formula: $C_{10}H_{13}N_5O_5$
 Purity: $\geq 98\%$ by elemental analysis
 Storage and Stability: Refrigerate. This product is stable for 3 years as supplied.
 References: Spencer, J.P.E., et al. 1995. FEBS Lett. 374, 233.
 Park, E.-M., et al. 1992. Proc. Natl. Acad. Sci. USA 89, 3375.
 Lin, T.-S., et al. 1985. J. Med. Chem. 28, 1194.



2,3-dimethoxy-1-naphthoquinone

26510

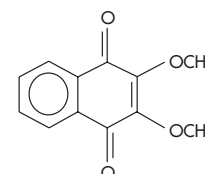
DMNQ

Catalog Number 26510

For Research Use Only, Not Intended For Use in Diagnostic Procedures

The use of naphthoquinoid compounds as free radical initiators is often compromised by their propensity to undergo nucleophilic addition, e.g. with sulfur-containing nucleophiles like glutathione. DMNQ is a novel, non-alkylating, non-thiol, adduct-forming compound which can be used to eliminate the previous mechanistic ambiguity involving redox-cycling quinoids as the source of reactive oxidant species/oxidative stress in biological studies.

Source: Synthetic Purity: >99% (TLC)
 Form: Crystalline (solid)
 Packaging Size: 200 mg
 Storage and Stability: One year at 2° - 8° C
 Molecular Weight: 218
 Molecular Formula: C₁₂H₁₀O₄



1-Methyl-4-vinyl-pyridinium Trifluoromethane Sulfonate

26513

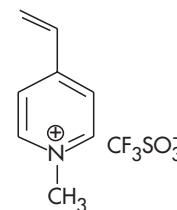
M4VP

Catalog Number 26513

For Research Use Only, Not Intended For Use in Diagnostic Procedures

Specifically designed to trap mercaptans in aqueous samples. Applications include: elimination of interferences due to mercaptans in the measurement of biological parameters, inhibition of chemical or enzymatic reactions involving sulfhydryl groups and reversible protection of these groups in aqueous medium.

Source: Synthetic
 Purity: >97% (GSH-DTNB titration)
 Form: Crystalline white powder
 Specificity: At neutral pH, only mercaptans are trapped. Other nucleophiles, such as amines or alcohols, do not react or react slowly.
 Packaging Size: 500 mg
 Storage and Stability: One year at 2° - 8° C
 Molecular Weight: 269
 Molecular Formula: C₈H₁₀N⁺(CF₃SO₃⁻)



* U.S. Patent 5543298

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