Proteases & Phosphatases
Inhibitors, Enzymes & Assays

Featuring Inhibitor Selection Guides
Protease Inhibitor Cocktails

INTRODUCTION

Protease Inhibitor cocktails and specific inhibitors to proteases are important in the protection of proteins from proteolysis in such applications as protein extraction, purification, electrophoresis, storage, assays etc.

During isolation and characterization of the proteins, proteases are released following cell or tissue lysis and degrade protein samples, which can reduce the quality of the protein sample for further analysis. In order to prevent degradation of the proteins, protease inhibitor cocktail is added, which help preserve the nature of the protein.

G-Biosciences offers a large selection of protease inhibitor cocktails, protease assays and screening systems, phosphatase inhibitor cocktails, as well as specific proteases for use in protein sequencing and mass spectrometry.

G-Biosciences offers ProteaseArrest™, which is a broad range of protease inhibitor cocktails with wide species specificity. ProteaseArrest™ cocktails are used for inhibition of protease activity in protein preparations of mammalian, bacterial, plant, yeast and fungal lysates.

General protease inhibitors and a large selection of individual protease inhibitors are offered separately or as a protease inhibitor set in addition to the ProteaseArrest™ inhibitor cocktails. For the identification of specific proteases and to screen for the presence of proteases, several protease assays and screening systems are available. For the protection of protein phosphatase groups, PhosphataseArrest™ Phosphatase Inhibitor Cocktails are offered.

PROTEASE INHIBITORS

ProteaseArrest™

A broad range protease inhibitor cocktail with wide species specificity

ProteaseArrest™ is a general protease inhibitor cocktail solution that is provided as a 100× concentrated, ready-to-use solution. The ProteaseArrest™ 100× solution format is suitable for small, analytical sample applications, as >95% inhibition is achieved by adding 10 μl ProteaseArrest™ per ml sample. For samples with higher than normal protease levels, the volume of ProteaseArrest™ added can be increased for greater inhibition levels.

The cocktail contains reversible and irreversible inhibitors of serine, cysteine, calpain and metallo-proteases.

An optional EDTA solution is provided for enhanced metallopeptase inhibition. It is not present in the actual ProteaseArrest™ cocktail as it would inhibit the activity of proteins that require divalent cations (Ca²⁺, Mg²⁺ or Mn²⁺) for their biological activity. In addition, EDTA will inhibit the purification of proteins using immobile metal affinity chromatography (IMAC), including 6X His tagged recombinant proteins.

Due to the optimized concentration of the various inhibitors, ProteaseArrest™ shows excellent inhibition of protease activities and is therefore suitable for the protection of proteins during preparation of samples and protein purification from animal tissues, plants, yeast and bacteria.

ProteaseArrest™ is also available as single use aliquots that are suitable for >95% protease inhibition in 10 ml solutions. These OneQuant™ ProteaseArrest™ are provided for additional protease inhibitor cocktail convenience.

The ProteaseArrest™ format allows delivery of optimized concentrations of protease inhibitor, for example 2X or higher concentrations can be added for tissues with higher than normal protease concentrations; a feature not possible with tablet format protease inhibitor cocktails.

In our study, a 1X concentration of ProteaseArrest™ inhibits over 95% of protease activities (e.g. 0.5 mg/ml mouse pancreas extract). The ProteaseArrest™ protease inhibitor cocktail demonstrated greater inhibition levels compared to similar protease inhibitor cocktails, including tablet formats. In independent studies, researchers have found that ProteaseArrest™ outperforms several leading manufacturer’s protease inhibitor cocktails, including tablet formats, in the purification of plant proteins.

COMPOSITION

- 566.5 μM AEBSF, 0.3 μM Aprotinin, 3 μM Bestatin, 5.25 μM Leupeptin, 1 mM PMSF, 5 mM EDTA (Optional) in DMSO

FEATURES

- Broad spectrum protease inhibitor cocktail
- 100× concentrated, ready-to-use solution
- High inhibition levels: 1X ProteaseArrest™ inhibits >95% of protease activities (i.e. 0.5 mg/ml mouse pancreas extract)

APPLICATIONS

- Inhibition of protease activity in protein preparations of mammalian, bacterial, plant, yeast and fungal lysates
- Protection of proteins from proteolysis in such applications as electrophoresis, purification, storage, assays, and other applications

CITED REFERENCES


More references available at www.gbiosciences.com

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<td>ProteaseArrest™ [100X]</td>
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<tr>
<td>786-329</td>
<td>OneQuant™ ProteaseArrest™ [100X]</td>
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For further details, visit GBiosciences.com
FOCUS™ ProteaseArrest™

A 2D electrophoresis & mass spectrometry compatible protease inhibitor cocktail

A ready-to-use, 100X concentrated, broad range protease inhibitor cocktail that is fully compatible with 2D electrophoresis and subsequent mass spectrometry.

The protease inhibitor cocktail contains reversible and irreversible inhibitors of serine, cysteine, calpain and metallo-proteases. Due to the optimized concentration of the various inhibitors, the FOCUS™ ProteaseArrest™ shows excellent inhibition of protease activities and is therefore suitable for the protection of protein samples from animal tissues, plants, yeast and bacteria.

FOCUS™ ProteaseArrest™ is compatible with 2D electrophoresis as it uses an alternative to EDTA as an inhibitor of metalloproteases. The absence of EDTA allows for optimal action of nuclease for removing nucleic acids from the samples. In addition, FOCUS™ ProteaseArrest™ uses PMSF as its primary serine protease inhibitor as opposed to the commonly used Pefabloc®. Pefabloc® has been reported to modify proteins at high concentrations and result in artifacts in subsequent 2D electrophoresis and mass spectrometry.

COMPOSITION
- 340µM AEBSF, 0.3µM Aprotinin, 1.45µM Bestatin, 3.4µM Calpain Inhibitor I, 5.25µM Leupeptin, 17µM Phosphoramidon, 1mM PMSF in DMSO

FEATURES
- 2D electrophoresis compatible, broad spectrum protease inhibitor cocktail
- 100X concentrated, ready-to-use solution
- High inhibition levels: 1X FOCUS™ ProteaseArrest™ inhibits >95% of protease activities (i.e. mouse pancreas extract, 0.5mg/ml protein)

APPLICATIONS
- Inhibition of protease activity in protein preparations
- Suitable for 2D gel sample preparation for protection of protein samples

CITED REFERENCES

Plant ProteaseArrest™

A protease inhibitor cocktail enhanced with plant specific protease inhibitors

A plant, broad range, 100X concentrated, ready-to-use protease inhibitor cocktail. Plant ProteaseArrest™ inhibits plant serine, cysteine and other plant specific proteases including aminopeptidases, aspartic and metalloproteases.

COMPOSITION
- 668µM AEBSF, 3µM Bestatin, 14µM E-64, 5.25µM Leupeptin, 1µM Pepstatin A, 2mM 1,10-Phenathroline, 1mM PMSF in DMSO

FEATURES
- Plant specific protease inhibitor cocktail
- 100X concentrated, ready-to-use solution

APPLICATIONS
- Inhibition of proteases in protein preparations of plant lysates
- Protection of proteins from proteolysis in electrophoresis, purification, storage, assays, and other applications

CITED REFERENCES

Bacterial ProteaseArrest™

A protease inhibitor cocktail enhanced with bacterial specific protease inhibitors

A bacterial, broad range, 100X concentrated, ready-to-use protease inhibitor cocktail. Bacterial ProteaseArrest™ inhibits bacterial serine, cysteine and other bacterial specific proteases including aminopeptidases and aspartic proteases.

An optional EDTA solution is provided for enhanced metalloprotease inhibition. It is not present in the actual Bacterial ProteaseArrest™ cocktail as it would inhibit the activity of proteins that require divalent cations (Ca²⁺, Mg²⁺ or Mn²⁺) for their biological activity. In addition, EDTA will inhibit the purification of proteins using immobilized metal affinity chromatography (IMAC).

COMPOSITION
- 668µM AEBSF, 3µM Bestatin, 14µM E-64, 5mM EDTA (Optional), 1µM Pepstatin A, 1mM PMSF in DMSO

FEATURES
- Bacteria specific protease inhibitor cocktail
- 100X concentrated, ready-to-use solution

APPLICATIONS
- Inhibition of protease activity in protein preparations of bacterial lysates
- Protection of proteins from proteolysis in such applications as electrophoresis, purification, storage, assays, and other applications

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<td>786-342</td>
<td>Bacterial ProteaseArrest® (100X)</td>
<td>5ml</td>
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</tbody>
</table>

For further details, visit GBiosciences.com
Protease Inhibitor Cocktails

Mammalian ProteaseArrest™

A protease inhibitor cocktail enhanced with mammalian specific protease inhibitors

- A mammalian, broad range, 100X concentrated, ready-to-use protease inhibitor cocktail. Mammalian ProteaseArrest™ inhibits mammalian serine, cysteine and other mammalian specific proteases including aminopeptidases, trypsin-like and aspartic proteases. An optional EDTA solution is provided for enhanced metalloprotease inhibition. It is not present in the actual Mammalian ProteaseArrest™ cocktail as it would inhibit the activity of proteins that require divalent cations (Ca²⁺, Mg²⁺ or Mn²⁺) for their biological activity. In addition, EDTA will inhibit the purification of proteins using immobilized metal affinity chromatography.

COMPOSITION
- 668µM AEBSF, 0.3µM Aprotinin, 3µM Bestatin, 14µM E-64, 5mM EDTA (Optional), 5.25µM Leupeptin, 1µM Pepstatin A, 1mM PMSF in DMSO

FEATURES
- Mammalian specific protease inhibitor cocktail
- 100X concentrated, ready-to-use solution

APPLICATIONS
- Inhibition of protease activity in protein preparations of mammalian lysates
- Protection of proteins from proteolysis in such applications as electrophoresis, purification, storage, assays, and other applications

CITED REFERENCES


Yeast/ Fungal ProteaseArrest™

A protease inhibitor cocktail enhanced with yeast and fungal specific protease inhibitors

- A yeast and fungal, broad range, 100X concentrated, ready-to-use protease inhibitor cocktail. Yeast/ Fungal ProteaseArrest™ inhibits yeast and fungal serine, cysteine and metalloproteases.

COMPOSITION
- 668µM AEBSF, 14µM E-64, 1µM Pepstatin A, 2mM 1,10-Phenanthroline, 1mM Benzamidine, 5.25µM Leupeptin, 1µM Leupeptin, 1mM PMSF in DMSO

FEATURES
- Yeast and fungal specific protease inhibitor cocktail
- 100X concentrated, ready-to-use solution

APPLICATIONS
- Inhibition of protease activity in protein preparations of yeast and fungal lysates
- Protection of proteins from proteolysis in such applications as electrophoresis, purification, storage, assays, and other applications

CITED REFERENCES

Recom ProteaseArrest™

Broad range bacterial inhibitor cocktail

- Recom ProteaseArrest™ is a broad range, bacterial, 100X concentrated, ready-to-use protease inhibitor cocktail. Recom ProteaseArrest™ offers greater protection for recombinant proteins expressed and purified from bacteria. Inhibits bacterial serine, cysteine, metallo- and other bacterial specific proteases including aminopeptidases and aspartic proteases.

- Recom ProteaseArrest™ cocktail does not use EDTA as its metalloprotease inhibitor as it would inhibit the activity of proteins that require divalent cations (Ca²⁺, Mg²⁺ or Mn²⁺) for their biological activity. In addition, EDTA would inhibit the purification of proteins using immobilized metal affinity chromatography (IMAC), for example His tagged or CBP tagged proteins. Recom ProteaseArrest™ cocktail is compatible with immobilized metal affinity chromatography.

COMPOSITION
- 668µM AEBSF, 1mM 1,10-Phenanthroline, 1mM Benzamidine, 1mM Iodoacetamide, 1µM Pepstatin A, 1mM PMSF in DMSO

CITED REFERENCES

TCM ProteaseArrest™

For use in tissue culture media

- TCM ProteaseArrest™ is a broad range, 200X concentrated, ready-to-use protease inhibitor cocktail, sterile filtered for tissue culture media. TCM ProteaseArrest™ inhibits a wide range of serine, cysteine and other specific proteases including aminopeptidases, trypsin-like and acid proteases.

- The inhibitor cocktail is designed to protect secreted proteins during cell culture for up to 48 hours.

COMPOSITION
- 0.6µM Aprotinin, 58µM Bestatin, 28µM E-64, 10.5µM Leupeptin, 2.1µM Pepstatin A in DMSO

FEATURES
- Broad range protease inhibitor cocktail
- Stable for up to 48 hours in cell culture media
- Sterile filtered

Cat. No. | Description                  | Size   
---------|-----------------------------|--------
786-238  | TCM ProteaseArrest™ [200X]  | 1ml    
786-239  | TCM ProteaseArrest™ [200X]  | 2ml    

For further details, visit GBiosciences.com
**ProteCEASE™**

A protease inhibitor cocktail for large scale preparative applications

ProteCEASE™ is a dry format version of our ProteaseArrest™ for large scale preparative applications and for those who prefer reconstitution prior to use.

ProteCEASE™ is a superior general protease inhibitor cocktail that is suitable for purification from mammalian, plant, bacteria and yeast samples. The cocktail contains both irreversible and reversible protease inhibitors to inhibit serine, cysteine and other proteases. EDTA is an optional component and is for inhibiting metalloproteases.

The EDTA-free ProteCEASE™ will maintain activity of proteins dependent on divalent cations and will not inhibit the purification of proteins with immobilized metal affinity chromatography (IMAC).

ProteCEASE™ has been specifically developed for large scale preparative applications and is available in two vial sizes: ProteCEASE™-50 for 50ml of lysis buffer.

ProteCEASE™-100 for 100ml of lysis buffer.

ProteCEASE™-50 is available in packs of 10 or 20 vials for 500ml and 1 liter total volume and ProteCEASE™-100 is available in packs of 10 for 1 liter volume.

**COMPOSITION**

- 668µM AEBSF, 0.3µM Aprotinin, 3µM Bestatin, 5mM EDTA (Optional), 5.25µM Leupeptin, 1mM PMSF

**FEATURES**

- High protease inhibition; >95% in mouse pancreas lysate
- Inhibits a wide variety of proteases, including cysteine, serine and metallo-proteases
- Designed for 50 and 100ml sample sizes
- Available with or without EDTA
- Performs with a wide range of samples, including animals, plants, yeast, bacteria and fungal lysates

**APPLICATIONS**

- For large scale preparative protein purifications
- Inhibition of protease activity in protein preparations
- Protection of proteins from proteolysis in such applications as electrophoresis, purification, storage, assays, and other applications

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**CITED REFERENCES**


For further details, visit GBiosciences.com

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**Protease Inhibitor Cocktails**

For further details, visit GBiosciences.com

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**Cat. No.** | **Description** | **Size**
--- | --- | ---
786-326 | ProteCEASE™-50, EDTA free | 10 vials
786-326T | ProteCEASE™-50, EDTA free (Optional) | 1 vial
786-327 | ProteCEASE™-50, EDTA free | 20 vials
786-328 | ProteCEASE™-100, EDTA free | 10 vials
786-334 | ProteCEASE™-50, plus EDTA | 10 vials
786-335 | ProteCEASE™-100, plus EDTA | 10 vials
786-336 | ProteCEASE™-50, plus EDTA | 20 vials
786-337 | ProteCEASE™-100, plus EDTA | 20 vials

More references available at www.gbiosciences.com
### Individual Protease Inhibitors

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Sample Type &amp; key features</th>
<th>Inhibition Specificity</th>
<th>1X Composition</th>
<th>Concentration &amp; Available Sizes</th>
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<tr>
<td>ProteaseARREST™</td>
<td>For general use. EDTA is supplied in a separate vial</td>
<td>Serine, cysteine, calpain and metallo-proteases</td>
<td>668µM AEBSF</td>
<td>100X DMSO solution 24 x 100µl, 2ml, 5ml, 10ml, 5 x 10ml</td>
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<tr>
<td>Bacterial ProteaseARREST™</td>
<td>For bacterial cell extracts EDTA is supplied in a separate vial</td>
<td>Bacterial serine, cysteine and other bacterial specific proteases including aminopeptidases and aspartic proteases</td>
<td>668µM AEBSF</td>
<td>100X DMSO solution 1ml, 5ml</td>
</tr>
<tr>
<td>Mammalian ProteaseARREST™</td>
<td>For mammalian tissue and cell extracts EDTA is supplied in a separate vial</td>
<td>Mammalian serine, cysteine and other mammalian specific proteases including aminopeptidases, trypsin-like and aspartic proteases</td>
<td>668µM AEBSF</td>
<td>100X DMSO solution 1ml, 5ml</td>
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<tr>
<td>Plant ProteaseARREST™</td>
<td>For plant tissue and cell extracts EDTA is supplied in a separate vial</td>
<td>Plant serine, cysteine and other plant specific proteases including aminopeptidases, aspartic and metalloproteases</td>
<td>668µM AEBSF</td>
<td>100X DMSO solution 1ml, 5ml</td>
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<tr>
<td>Yeast/Fungal ProteaseARREST™</td>
<td>For yeast and fungal cell extracts</td>
<td>Yeast and fungal serine, cysteine and metalloproteases</td>
<td>668µM AEBSF</td>
<td>100X DMSO solution 1ml, 5ml</td>
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<tr>
<td>Recom ProteaseARREST™</td>
<td>For recombinant protein isolation</td>
<td>Inhibits bacterial serine, cysteine, metallo- and other bacterial specific proteases including aminopeptidases and aspartic proteases</td>
<td>668µM AEBSF</td>
<td>100X DMSO solution 1ml, 5ml</td>
</tr>
<tr>
<td>TCM ProteaseARREST™</td>
<td>For protection of secreted proteins in tissue culture media. Sterile filtered</td>
<td>A wide range of serine, cysteine and other specific proteases including aminopeptidases trypsin-like and acid proteases</td>
<td>0.6µM Aprotinin, 58µM Bestatin, 28µM E-64, 10.5µM Leupeptin, 2.1µM Pepstatin A</td>
<td>200X Sterile filtered DMSO solution 1ml, 2ml</td>
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<tr>
<td>FOCUS™ ProteaseARREST</td>
<td>For sensitive downstream proteomic applications (i.e. 2DGE and mass spec)</td>
<td>Reversible and irreversible inhibitors of serine, cysteine, calpain and metallo-proteases</td>
<td>340µM AEBSF</td>
<td>100X DMSO solution 1ml</td>
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<tr>
<td>ProteCEASE™ 50 ProteCEASE™ 100</td>
<td>Dry Format with optional EDTA and resuspension buffer for 50ml or 100ml lysis buffer respectively</td>
<td>Serine, cysteine, calpain and metallo-proteases</td>
<td>668µM AEBSF</td>
<td>Lyophilized format with optional EDTA solution and solubilization solution 1, 10 &amp; 20 vials</td>
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</table>

Table 1: Protease inhibitor cocktail selection guide.
**AEBSF**

4-(2-Aminoethyl)benzenesulfonyl fluoride hydrochloride

**Specificity:** Specific irreversible inhibitor of serine proteases, including chymotrypsin, kallikrein, plasmin, thrombin and trypsin. A stable non-toxic alternative to PMSF.

**Solubility:** Water

**Molecular weight:** 239.7

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<tr>
<td>786-053</td>
<td>AEBSF</td>
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**ALLN**

Calpain inhibitor I; N-[N-(acetyl-L-leucyl)-L-leucyl]-L-norleucine

**Specificity:** Cell permeable peptide aldehyde inhibitor of calpain I and to a lesser extent calpain II. Also inhibits other neutral cysteine proteases, cathepsin B and L and the proteasome.

**Solubility:** DMSO or ethanol

**Molecular weight:** 383.5

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<tr>
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**Antipain, Dihydrochloride**

[(S)-1-Carboxy-2-phenyl]-carbamoyl-arg-val-arginal

**Specificity:** Inhibits Ca²⁺-dependent endopeptidases, including papain, trypsin-like serine proteases, some cysteine proteases and to a lesser extent plasmin. Higher specificity for trypsin and papain compared to leupeptin.

**Solubility:** Water, methanol and DMSO (Stock solution: 10mM)

**Molecular weight:** 677.6

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<tr>
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<td>Antipain dihydrochloride</td>
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**Aprotinin**

Bovine pancreatic trypsin inhibitor

**Specificity:** A broad range, competitive and reversible inhibitor of chymotrypsin, plasmin, trypsin, kallikrein and other serine proteases

**Solubility:** Water (Stock solution: 10mM)

**Molecular weight:** 6512

A globular, monomeric protein chain. The sequence is RPDFC LEPPY TGPOK ARIIR YFYNA KAGLC QTFVY GGCRA KRNNF KSAED CMRTC GGA

**CITED REFERENCES**


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<tr>
<td>786-1245</td>
<td>Aprotinin</td>
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</table>
**Individual Protease Inhibitors**

**Bestatin**

\[(2S, 2R)-3\text{-Amino-2-hydroxy-4-phenylbutanoyl}\]-L-leucine

![Structure of Bestatin](image)

**Specificity:** Competitive inhibitor of surface aminopeptidases, including aminopeptidase B (K_{d}=2nM), leucine aminopeptidase (K_{d}=20nM). Also inhibits aminopeptidases N; does not inhibit endoproteases.

**Solubility:** 5mg/ml in methanol or 1mg/ml in 0.15M NaCl

**Molecular weight:** 308.4

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<td>786-047</td>
<td>Bestatin</td>
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**Chymostatin**

N\{-[S]-1\text{-carboxy-isopentyl)}-carbamoyl-alpha-(2-iminohexahydro-4(S)-pyrimidyl\}-L-glycyl-L-phenylalaninal

![Structure of Chymostatin](image)

**Specificity:** Inhibits serine proteases having a chymotrypsin-like specificity, including \(\alpha\), \(\beta\), \(\gamma\), and \(\delta\) chymotrypsin, and most cysteine proteases including cathepsins B, H, L.

**Solubility:** DMSO

**Molecular weight:** 604.7

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**EDTA-Na2**

Ethylendiamine-tetraacetic acid disodium salt dihydrate

![Structure of EDTA-Na2](image)

**Specificity:** Metal chelator that inhibits metalloproteases.

**Solubility:** Water

**Molecular weight:** 372.24

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**E-64**

L\{-trans-epoxysuccinyl-leucylame-(4-guanido)-butane or N\{-[N\{-L\text{-trans-carboxyoxiran-2-carbonyl\)-leucyl}\]-agmatine

![Structure of E-64](image)

**Specificity:** Irreversible inhibitor of cysteine proteases; does not inhibit serine proteases.

**Solubility:** DMSO (25mg/ml) and aqueous buffers (20mg/ml)

**Molecular weight:** 357.4

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<td>786-985</td>
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**Leupeptin**

Acetyl-leucyl-leucyl-arginal

![Structure of Leupeptin](image)

**Specificity:** Inhibits serine, plasmin, porcine kallikrein and cysteine proteases, including papain and cathepsin B. Does not inhibit chymotrypsin and thrombin.

**Solubility:** Water, ethanol, acetic acid and DMF

**Molecular weight:** 426.6

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<td>786-051</td>
<td>Leupeptin</td>
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**CITED REFERENCES**

**Pepstatin**

Isovaleryl-val-val-AHMHA-ala-AHMHA where AHMHA= (3S, 4S)-4-amino-3-hydroxy-6-methyl-heptanoic acid

**Specificity:** A potent inhibitor of various aspartic proteases, including cathepsin D, renin, pepsin, bacterial aspartic proteases and HIV proteases.

**Solubility:** DMSO or methanol

**Molecular weight:** 685.9

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<tr>
<td>786-052</td>
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**Phosphoramidon**

N-alpha-L-rhamnopyranosyloxy(hydroxyphosphinyl)-L-Leucyl-L-Tryptophan

**Specificity:** Inhibits some metalloproteases, including thermolysin, collagenase and bacterial metalloproteases from *Bacillus subtilis*, *Streptomyces griseus* and *Pseudomonas aeruginosa* (metallo elastase).

**Solubility:** Water, methanol and DMSO

**Molecular weight:** 543.5

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</tbody>
</table>

**PMSF**

Phenylmethanesulfonyl fluoride

**Activity:** ≥99.9%

**Specificity:** Irreversible inhibitor of serine proteases, including trypsin and chymotrypsin. Also inhibits cysteine proteases and mammalian acetylcholinesterase.

**Solubility:** Methanol, ethanol and 2-propanol

**Molecular weight:** 174.2

**CITED REFERENCES**
1. Yalpani, N. et al (2017) An Alcaligenes strain emulates Bacillus thuringiensis producing a binary protein that kills corn 3 rootworm through a mechanism similar to Cry34Ab1/Cry35Ab1 Supplementary Methods

<table>
<thead>
<tr>
<th>Cat. No.</th>
<th>Description</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>786-055</td>
<td>PMSF</td>
<td>5g</td>
</tr>
<tr>
<td>786-787</td>
<td>PMSF</td>
<td>25g</td>
</tr>
<tr>
<td>786-788</td>
<td>PMSF</td>
<td>100g</td>
</tr>
</tbody>
</table>

**PROTEASE INHIBITOR SET**

**100X concentrated protease inhibitor selection**

Contains 12 ready-to-use individual protease inhibitors for characterization of protease activity.

Each protease inhibitor is supplied in a ready-to-use solution at a 100X concentration. The 1X concentration of the protease inhibitors is designed to give >90% inhibition in crude tissue extracts. Various concentrations and/or combinations of protease inhibitors may be used to inhibit a broad spectrum of protease activity.

The Protease Inhibitor Set can be used to design specific protease inhibitor cocktails, supplement existing cocktails or to screen for specific protease classes.

Each set contains the following protease inhibitors. See previous section for their specificities and other information:
- AEBSF
- ALLN
- Antipain, dihydrochloride
- Aprotinin
- Bestatin
- Chymostatin
- E-64
- EDTA-Na2
- Leupeptin
- Pepstatin
- Phosphoramidon
- PMSF

**CITED REFERENCES**

<table>
<thead>
<tr>
<th>Cat. No.</th>
<th>Description</th>
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<tbody>
<tr>
<td>786-207</td>
<td>Protease Inhibitor Set</td>
<td>12 x 25µl</td>
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</table>
## INHIBITOR SELECTION GUIDE

<table>
<thead>
<tr>
<th>Cat. No.</th>
<th>Inhibitor</th>
<th>Specificity</th>
<th>Solubility</th>
<th>Molecular Weight</th>
<th>Quantity Supplied</th>
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</thead>
<tbody>
<tr>
<td>786-053</td>
<td>AEBSF</td>
<td>4-(2-Aminoethyl)benzenesulfonyl fluoride</td>
<td>H₂O</td>
<td>239.7</td>
<td>1g</td>
</tr>
<tr>
<td>786-057</td>
<td>ALLN</td>
<td>Calpain inhibitor I; N-[N(+N-Acetyl-L-leucyl)-L-leucyl]-L-norleucine</td>
<td>DMSO, Ethanol</td>
<td>383.5</td>
<td>10mg</td>
</tr>
<tr>
<td>786-045</td>
<td>Antipain, Dihydrochloride</td>
<td>(S)-1-Carboxy-2-Phenyl-carbamoyl-Arg-Val-arginal</td>
<td>H₂O, Methanol, DMSO</td>
<td>677.6</td>
<td>5mg</td>
</tr>
<tr>
<td>786-046</td>
<td>Aprotinin</td>
<td>Bovine pancreatic trypsin inhibitor</td>
<td>H₂O</td>
<td>6512</td>
<td>100mg</td>
</tr>
<tr>
<td>786-047</td>
<td>Bestatin</td>
<td>(2S, 2R)-3-Amino-2-hydroxy-4-Phenylbutanoyl]-L-Leucine</td>
<td>Methanol (&lt;5mg/ml) NaCl [0.15M] (&lt;1mg/ml)</td>
<td>308.4</td>
<td>10mg</td>
</tr>
<tr>
<td>786-048</td>
<td>Chymostatin</td>
<td>N-[S]-1-carboxy-isopentyl)-carbamoyl-alpha-(2-iminohexahydro-4(S)-pyrimidyl]-L-glycyl-L-phenylalaninal</td>
<td>DMSO</td>
<td>604.7</td>
<td>5mg</td>
</tr>
<tr>
<td>786-049</td>
<td>E-64</td>
<td>L-trans-epoxysuccinyl-Leucylamide-(4-guanido)-butane or H-[N-(L-trans-carboxyoxiran-2-carbonyl]-L-leucyl]-agmatine</td>
<td>DMSO (25mg/ml) Aqueous buffers (20mg/ml)</td>
<td>357.4</td>
<td>5mg</td>
</tr>
<tr>
<td>786-050</td>
<td>EDTA-Na</td>
<td>Ethylenediamine-tetraacetic acid disodium salt dihydrate</td>
<td>H₂O</td>
<td>372.24</td>
<td>100g</td>
</tr>
<tr>
<td>786-051</td>
<td>Leupeptin</td>
<td>Acetyl-Leucyl-Leucyl-arginal</td>
<td>H₂O, Ethanol Acetic Acid</td>
<td>426.6</td>
<td>25mg</td>
</tr>
<tr>
<td>786-052</td>
<td>Pepstatin</td>
<td>Isovaleryl-Val-Val-AHMHA-Ala-AHMHA where AHMHA= (3S, 4S)-4-amino-3-hydroxy-6-methyl-heptanoic acid</td>
<td>Methanol</td>
<td>685.9</td>
<td>25mg</td>
</tr>
<tr>
<td>786-054</td>
<td>Phosphoramidon</td>
<td>N-alpha-L-rhamnopyranosyl(1'-hydroxyphosphoryl]-L-Leucyl-L-Tryptophan</td>
<td>H₂O, Methanol DMSO</td>
<td>543.5</td>
<td>10mg</td>
</tr>
<tr>
<td>786-055</td>
<td>PMSF</td>
<td>Phenylmethanesulfonyl fluoride</td>
<td>Methanol Ethanol 2-propanol</td>
<td>174.2</td>
<td>5g</td>
</tr>
</tbody>
</table>

Table 2: Protease inhibitor selection guide.
ProteSEEKER™

**Identify destructive proteases**

ProteSEEKER™ identifies specific types of proteases with a panel of twelve protease inhibitors and a sensitive colorimetric protease screening assay. It gives researchers the ability to screen their protein samples and establish which specific class of proteases are present and therefore design a highly specific protease inhibitor cocktail using the minimal number of protease inhibitors. Alternatively, ProteSEEKER™ can be used to test existing protease inhibitor cocktails and identify their inadequacies and therefore supplement in additional protease inhibitors.

ProteSEEKER™ protease screening assay consists of a ready-to-use dye-labeled protein, which is digested by proteases to release dye-labeled peptides. The absorbance of which is measured for determination of protease activity. The inhibitors are supplied at a 100X concentration and the 1X concentration provides >90% inhibition in most biological samples. ProteSEEKER™ kit is sufficient for 50 assays.

**CITED REFERENCES**


---

**Protease Screening Kit**

**Detect protease activity in your sample**

Provides a simple and quick method for testing your samples for proteolysis. Simply incubate your sample in the reagent provided and obtain results. The kit uses dye-labeled protein conjugate as protease substrate, which allows nanogram level detection. The absorbance of dye-labeled peptide is measured at 574nm for determination of protease activity. The kit is sufficient for 50 assays in a microwell format.

**CITED REFERENCES**


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**Protease Assay Kit**

**For assay of protease activity**

Designed for the determination of proteases present in a protein sample, using a dye-labeled protein substrate.

The proteases present in the sample of interest will digest the protein substrate and release dye labeled peptides. The absorbance of the dye-labeled peptide is measured at 570nm for determination of protease activity.

Mass spectrometry grade trypsin is supplied as a general protease standard; however, other specific protease standards can also be used. The trypsin is an ultra-pure trypsin from bovine pancreas, modified by methylation followed by TPCK treatment and is extremely resistant to autolysis.

The kit components are sufficient for 50 assays in a microtiter plate format or 0.5ml assay tubes.

**APPLICATIONS**

- Determination of protease activity in biological samples, with nanogram detection levels

**CITED REFERENCES**


---

### Tables

<table>
<thead>
<tr>
<th>Cat. No.</th>
<th>Description</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>786-325</td>
<td>ProteSEEKER™</td>
<td>50 assays</td>
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</table>

<table>
<thead>
<tr>
<th>Cat. No.</th>
<th>Description</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>786-028</td>
<td>Protease Assay Kit</td>
<td>50 Assays</td>
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</table>

<table>
<thead>
<tr>
<th>Cat. No.</th>
<th>Description</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>786-137</td>
<td>Protease Screening Kit</td>
<td>50 Assays</td>
</tr>
</tbody>
</table>
Fluoro™ Protease Assay

A fluorometric, quantitative protease assay

The Fluoro™ Protease Assay Kit is designed for the quantitative determination of proteases present in a protein sample. The assay uses fluorescein isothiocyanate (FITC)-labeled casein as a general protease substrate. The fluorescein label on the FITC-casein is highly quenched. When the proteases present in the sample of interest digest the FITC-casein substrate into smaller peptides, the quenching of the fluorescence label is relieved and the fluorescence of the substrate is increased. The fluorescence of the FITC-labeled peptide is measured with excitation at 485nm and emission at 535nm to determine protease activity. The kit detects picogram level of proteases present in the sample.

The kit is supplied with mass spectrometry grade trypsin for use as a general protease control; however, other specific protease standard controls can be used. The trypsin is an ultra-pure trypsin from porcine pancreas, modified by methylation followed by TPCK treatment and is extremely resistant to autolysis. The kit components are sufficient for 1,000 assays in a microtiter plate format.

APPLICATIONS
- Quantitative fluorescence protease assay

CITED REFERENCES

Protease Assay Substrates

Resorufin and FITC-casein protease substrates

Resorufin-casein protease substrate is a colorimetric substrate that when treated with proteases releases resorufin that has an absorbance of 570nm. Supplied lyophilized.

A fluorescent (fluorescein isothiocyanate (FITC)) substrate that when treated with proteases releases FITC that has an excitation at 485nm and emission at 535nm. Supplied lyophilized.

CITED REFERENCES
The PhosphataseArrest™ phosphatase inhibitor cocktails are ready-to-use 100X solutions that are simply added to your extraction buffers or samples. Compatible with most phosphatase assays and no resuspension required.

**PhosphataseArrest™ I**

A broad spectrum phosphatase inhibitor cocktail consisting of five phosphatase inhibitors that target serine/threonine specific, tyrosine specific and dual specificity phosphatases.

PhosphataseArrest™ I is a stabilized solution of sodium fluoride, sodium orthovanadate, sodium pyrophosphate, β-glycerophosphate & sodium molybdate.

<table>
<thead>
<tr>
<th>Phosphatase Inhibitor</th>
<th>M.W.</th>
<th>Target Phosphatases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium fluoride</td>
<td>42.0</td>
<td>Acid phosphatases</td>
</tr>
<tr>
<td>Sodium Orthovanadate</td>
<td>183.9</td>
<td>Tyrosine phosphatases, Alkaline phosphatases</td>
</tr>
<tr>
<td>Sodium Pyrophosphate</td>
<td>221.94</td>
<td>Serine/Threonine phosphatases</td>
</tr>
<tr>
<td>β-Glycerophosphate</td>
<td>306.1</td>
<td>Serine/Threonine phosphatases</td>
</tr>
<tr>
<td>Sodium Molybdate</td>
<td>205.92</td>
<td>Acid Phosphatase</td>
</tr>
</tbody>
</table>

**PhosphataseArrest™ II**

A phosphatase inhibitor cocktail consisting of five phosphatase inhibitors that target acid, alkaline and tyrosine phosphatases.

PhosphataseArrest™ II contains optimized concentrations of sodium fluoride, sodium tartrate, sodium orthovanadate, imidazole & sodium molybdate.

<table>
<thead>
<tr>
<th>Phosphatase Inhibitor</th>
<th>M.W.</th>
<th>Target Phosphatases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium fluoride</td>
<td>42.0</td>
<td>Acid phosphatases</td>
</tr>
<tr>
<td>Sodium Orthovanadate</td>
<td>183.9</td>
<td>Tyrosine phosphatases, Alkaline phosphatases</td>
</tr>
<tr>
<td>Sodium Tartrate</td>
<td>230.08</td>
<td>Acid phosphatases</td>
</tr>
<tr>
<td>Imidazole</td>
<td>68.08</td>
<td>Alkaline phosphatases</td>
</tr>
<tr>
<td>Sodium Molybdate</td>
<td>205.92</td>
<td>Acid Phosphatase</td>
</tr>
</tbody>
</table>

**PhosphataseArrest™ III**

A phosphatase inhibitor cocktail consisting of three phosphatase inhibitors, that target alkaline and serine/threonine phosphatases.

PhosphataseArrest™ III is a stable, convenient solution of cantharidin, p-bromotetramisole oxalate and calycin.

<table>
<thead>
<tr>
<th>Phosphatase Inhibitor</th>
<th>M.W.</th>
<th>Target Phosphatases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cantharidin</td>
<td>196.2</td>
<td>Serine/Threonine phosphatases</td>
</tr>
<tr>
<td>p-Bromotetramisole Oxalate</td>
<td>373.23</td>
<td>Alkaline phosphatases</td>
</tr>
<tr>
<td>Calycin</td>
<td>1009.17</td>
<td>Serine/Threonine phosphatases</td>
</tr>
</tbody>
</table>

**Selection Guide for Phosphatase Inhibitor Cocktails**

<table>
<thead>
<tr>
<th>Cat. No.</th>
<th>Description</th>
<th>Target Phosphatases</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>786-450</td>
<td>PhosphataseArrest™ (100X)</td>
<td>Serine/Threonine Tyrosine Dual Specificity</td>
<td>1ml</td>
</tr>
<tr>
<td>786-647</td>
<td>PhosphataseArrest™ (100X)</td>
<td>Serine/Threonine Tyrosine Dual Specificity</td>
<td>24 x 100ul</td>
</tr>
<tr>
<td>786-782</td>
<td>PhosphataseArrest™ (100X)</td>
<td>Serine/Threonine Tyrosine Dual Specificity</td>
<td>2ml</td>
</tr>
<tr>
<td>786-783</td>
<td>PhosphataseArrest™ (100X)</td>
<td>Serine/Threonine Tyrosine Dual Specificity</td>
<td>5ml</td>
</tr>
<tr>
<td>786-784</td>
<td>PhosphataseArrest™ (100X)</td>
<td>Serine/Threonine Tyrosine Dual Specificity</td>
<td>10ml</td>
</tr>
<tr>
<td>786-451</td>
<td>PhosphataseArrest™ II (100X)</td>
<td>Acid Alkaline Tyrosine</td>
<td>1ml</td>
</tr>
<tr>
<td>786-452</td>
<td>PhosphataseArrest™ III (100X)</td>
<td>Alkaline Serine/Threonine</td>
<td>1ml</td>
</tr>
</tbody>
</table>

**CITED REFERENCES**

Phosphatase Assay

A pNPP based assay for simple phosphatase estimation

The Phosphatase Assay kit is designed to measure the activity of phosphatases in biological samples and to screen for agonists and inhibitors of phosphatases.

The Phosphatase Assay kit uses para-nitrophenyl phosphate (pNPP), a chromogenic substrate for most phosphatases, including alkaline phosphatases, acid phosphatases, protein tyrosine phosphatases and serine/threonine phosphatases.

The phosphatases remove the phosphate group to generate p-nitrophenol, which is deprotonated under alkaline conditions to produce p-nitrophenolate that has strong absorption at 405nm.

The kits components are sufficient for performing up to 1000 assays in 96-well plate format and easily adaptable to cuvettes or 384-well plates.

Figure 16: Scheme of Phosphatase Assay.

FEATURES
- A colorimetric, pNPP based assay
- Measure phosphatase activity in biological samples
- Screen for phosphatase agonists and inhibitors

APPLICATIONS
- For the quantification of phosphatase activity
- To screen for agonists and inhibitors of phosphatases

CITED REFERENCES

Protease-PhosphataseArrest™ [100X]

Protease-PhosphataseArrest™ provides full protection of protein samples from proteases and phosphatases released during the preparation of cell and tissue lysates.

<table>
<thead>
<tr>
<th>Cat. No.</th>
<th>Description</th>
<th>Size</th>
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<tbody>
<tr>
<td>786-870</td>
<td>Protease-PhosphataseArrest™ [100X]</td>
<td>For 100ml</td>
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<tr>
<td>786-871</td>
<td>Protease-PhosphataseArrest™ [100X]</td>
<td>For 200ml</td>
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<tr>
<td>786-872</td>
<td>Protease-PhosphataseArrest™ [100X]</td>
<td>For 500ml</td>
</tr>
<tr>
<td>786-889</td>
<td>Protease-PhosphataseArrest™ [100X]</td>
<td>For 240ml</td>
</tr>
</tbody>
</table>

PhosphoQuant™

Estimation of phosphates in phosphoproteins.

PhosphoQuant™ is specifically designed for quick and reliable determination of whether a purified protein is phosphorylated and the extent of phosphorylation. The assay is based on the alkaline hydrolysis of phosphates from seryl and threonyl residues in phosphoproteins and the subsequent quantification of the released phosphate with a Molybdate dye.
**MASS SPECTROMETRY GRADE PROTEASE**

**Trypsin for Mass Spectrometry**

Trypsin is a serine endopeptidase that specifically cleaves peptide bonds on the carboxy side of s-aminooethyl cysteine, arginine and lysine residues. Typically there is little or no cleavage at arginyl-proline and lysyl-proline bonds.

Trypsin undergoes autolysis, producing trypsin fragments that interfere with sequence analysis. G-Biosciences' mass spectrometry grade trypsin is a chemically modified trypsin that is enzymatically active and yet resistant to autolysis. Mass spectrometry grade trypsin is methylated, TPCK treated and quality tested for mass spectrometry.

Unlike other trypsin preparations, mass spectrometry grade trypsin is highly stable, maintaining its activity in severe denaturing buffers and as a result, is shipped without requiring dry ice and can be stored for a long period without any loss of activity.

We supply two sources of mass spectrometry grade trypsin, either bovine or porcine. For mass spectrometry sequence analysis, mass spectrometry grade trypsin to protein ratio of 1:20 to 1:100 is recommended. For convenience, mass spectrometry grade trypsin is supplied in 20µg, 100µg and 200µg vials with a specific resuspension buffer.

### FEATURES
- Ultra pure porcine or bovine trypsin
- Modified by methylation and TPCK treatment
- Resistant to autolysis and degradation
- For sequence analysis and mass spectrometry applications
- Stable at ambient temperature and suitable for long term storage
- Specific activity >10,000U/mg protein

### APPLICATIONS
- Digestion of proteins for sequence and peptide fragment analysis
- Suitable for sequencing and mass spectrometry applications

---

**Figure 17:** MALDI-TOF Mass Spectrum of casein digested with our mass spectrometry grade trypsin.

**Figure 18:** Mass spectrometry grade trypsin is highly stable. Stored at -20°C, -70°C and room temperature for six months and then resuspended and analyzed by SDS-PAGE and stained with FOCUS FastSilver™. For a comparison, a competitor’s trypsin was resuspended according to the manufacturer’s protocol and an equivalent amount was analyzed. Only our mass spectrometry grade trypsin stored at room temperature and the competitor’s trypsin showed degradation products.

---

**CITED REFERENCES**


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**Table:**

<table>
<thead>
<tr>
<th>Cat. No.</th>
<th>Description</th>
<th>Size</th>
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</thead>
<tbody>
<tr>
<td>786-245</td>
<td>Trypsin, Mass Spectrometry Grade (Porcine)</td>
<td>5 x 20µg</td>
</tr>
<tr>
<td>786-245B</td>
<td>Trypsin, Mass Spectrometry Grade (Porcine)</td>
<td>5 x 20µg</td>
</tr>
<tr>
<td>786-687</td>
<td>Trypsin, Mass Spectrometry Grade (Bovine)</td>
<td>100µg</td>
</tr>
<tr>
<td>786-687B</td>
<td>Trypsin, Mass Spectrometry Grade (Bovine)</td>
<td>5 x 100µg</td>
</tr>
<tr>
<td>786-688</td>
<td>Trypsin, Mass Spectrometry Grade (Porcine)</td>
<td>200µg</td>
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<tr>
<td>786-690</td>
<td>Trypsin, Mass Spectrometry Grade (Bovine)</td>
<td>5 x 100µg</td>
</tr>
<tr>
<td>786-693</td>
<td>Trypsin, Mass Spectrometry Grade (Porcine)</td>
<td>5 x 200µg</td>
</tr>
</tbody>
</table>

---

For further details, visit GBiosciences.com
Proteinase K

**Specificity:** Non-specific, broad spectrum serine protease that is isolated from the saprophytic fungus *Trirachium album.*

**Solubility:** Highly soluble (>50mg/ml)

**Molecular weight:** 28.93 kDa

<table>
<thead>
<tr>
<th>Cat. No.</th>
<th>Description</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>786-043</td>
<td>Proteinase K, lyophilized</td>
<td>100mg</td>
</tr>
<tr>
<td>786-044</td>
<td>Proteinase K, lyophilized</td>
<td>5 x 100mg</td>
</tr>
<tr>
<td>786-035</td>
<td>Proteinase K, lyophilized</td>
<td>250mg</td>
</tr>
<tr>
<td>786-064</td>
<td>Proteinase K, lyophilized</td>
<td>1mg</td>
</tr>
<tr>
<td>786-065</td>
<td>Proteinase K, lyophilized</td>
<td>5g</td>
</tr>
</tbody>
</table>

Trypsin, Lyophilized

**A general use trypsin**

Purified from bovine pancreas, 1x crystallized, dialyzed against 1mM HCl and lyophilized. >150 TAME units/mg. One Unit hydrolyzes 1µmole of p-toluene-sulfonyl-L-arginine methyl ester (TAME) per minute at 25°C, pH 8.2, in the presence of 10mM calcium.

**FEATURES**

- Animal free source of origin, therefore no any other contaminating proteases.
- Highly purified recombinant enterokinase that cleaves specifically after lysine preceded by four aspartic acid residues.

**APPLICATIONS**

- Enterokinase is used for removal of Flag Tag from fusion proteins with the FLAG-tag.

Enterokinase (Recombinant)

Enterokinase (Recombinant) is highly purified recombinant bovine enterokinase obtained from E. Coli. Enterokinase is highly specific serine protease that hydrolysis peptide bond at the carboxyl side of lysine residue preceded by four aspartic acids (FLAG-tag).

**CITED REFERENCES**


SG-Chymotrypsin™

**Hydrolysis of peptide bonds on the carboxy side of tyrosine, phenylalanine & tryptophan**

A serine endopeptidase, which predominantly cleaves peptide bonds on the carboxy side of tyrosine, phenylalanine and tryptophan. In addition, chymotrypsin has a low catalytic activity against the carboxy side of leucine, methionine, alanine, aspartic and glutamic acids. It is therefore recommended to always use the shortest digestion time possible.

**SG-Chymotrypsin™** is first treated with TLCK to inhibit trypsin that may be present and then subjected to an extensive purification process to remove contaminating protease and chymotryptic autolysis by-products. The highly purified enzyme is then chemically modified to increase its resistance to autoysis and stability.

Use at a ratio of 1:200 to 1:50, by weight, in a standard digestion buffer. Incubate at 25-30°C for 1 to 10 hours, but can be extended to 24 hours.

SG-Lysine-C™

**Cleaves peptide bonds at the carboxy side of lysine**

An endopeptidase, from Lysobacter enzymogenes, is a serine protease highly specific in cleaving peptide bonds at the carboxy side of lysine. Highly purified preparations of SG-Lysine-C™ are chemically modified making the enzyme resistant to autoysis and stabilizing its enzymatic activity.

SG-Lysine-C™ is supplied lyophilized in 5µg vials. The enzyme is typically reconstituted to a concentration of 0.25µg/ml. For fragmentation, the enzyme is added to the sample protein in a ratio of 1:100 to 1:20 (enzyme to protein, by weight) in a standard digestion buffer.

SG-Glutamic-C™

**Cleaves peptide bonds at the carboxy side of either aspartic or glutamic acid**

A serine endopeptidase, from *Staphylococcus aureus* V8, that is highly specific for the cleavage of peptide bonds at the carboxy side of either aspartic or glutamic acid, depending on the buffer used. In Tris-HCl buffer, in particular in the absence of phosphate ions, the enzyme is specific for the glutamyl site. Recommended buffers for fragmentation of proteins using this enzyme are 50mM Tris-HCl, pH 8.0 or bicarbonate buffer. Highly purified preparations of SG-Glutamic-C™ are chemically modified making the enzyme both resistant to autoysis and stabilizes its enzymatic activity.

SG-Glutamic-C™ is supplied lyophilized in 10µg vials. The enzyme is typically reconstituted to a concentration of 0.5µg/ml and commonly used at a ratio of 1:100 to 1:20 (enzyme to protein, by weight) in a standard digestion buffer.

**CITED REFERENCES**


For further details, visit GBiosciences.com
SG-Arginine-C™

Endopeptidase for the specific hydrolysis of the carboxy peptide bond of arginine

An endopeptidase (Clostripain, from Clostridium histolyticum) specifically hydrolyzes the carboxy peptide bond of Arginine. SG-Arginine-C™ has been modified chemically by a propriety process to render the enzyme resistant to autolysis and stabilize enzymatic activity. In addition, as a sulfhydryl enzyme, SG-Arginine-C™ is susceptible to inactivation by oxidation and as a result requires reducing agents for protection. The enzyme also requires calcium ion for maximal activity. A special reconstitution buffer is supplied, which contains reducing agents and activators to maintain enzyme activity.

SG-Arginine-C™ is supplied lyophilized in an activated form in 5µg vials and can be reconstituted to a concentration of 0.25µg/ml by addition of 20µl per vial of the supplied reaction buffer. For fragmentation the enzyme is added to the sample protein in a ratio of 1:100 to 1:20 (enzyme to protein, by weight).

CITED REFERENCES

Cat. No. Description Size
---
786-11 SG-Arginine-C™ 2 x 5µg

SG-Chymotrypsin (Human, Recombinant)™

SG-Chymotrypsin (Human, Recombinant)™ is recombinant human chymotrypsin expressed in E. coli and purified by HPLC method. Chymotrypsin hydrolysis at the carboxyl side of aromatic amino acid residues including Tyrosine, phenylalanine and Tryptophan. Cleavage occurs at lower rate at Leucine and methionine residues.

FEATURES
- Animal free source of origin, therefore no any other contaminating proteases.
- High purity: >95%, purified with HPLC

APPLICATIONS
- Chymotrypsin is used peptide mapping (mass spectrometry), fingerprinting and sequence analysis alone or along with other proteases.

Cat. No. Description Size
---
786-1251 SG-Chymotrypsin (Human, Recombinant)™ 0.1 mg
786-1252 SG-Chymotrypsin (Human, Recombinant)™ 1 mg

Trypsin (Human, Recombinant)

Trypsin is a serine protease that cleaves peptides on C-terminal end of lysine and arginine amino acid residues. The pH optimum of trypsin is pH 7.0-8.0. Trypsin is inhibited by serine protease inhibitors including TLCK (N-p-tosyl-L-lysine chloromethyl ketone), PMSF (phenylmethanesulfonyl fluoride), benzamidine, soybean trypsin inhibitor, and ovomucoid.

Trypsin (Human, Recombinant) is genetically engineered human trypsin expressed in E. coli and purified by high pressure liquid chromatography. It has animal free source of origin, so is virus free and also it has no other contaminating proteases such as chymotrypsin and carboxypeptidase. No protease inhibitor such as PMSF involved in its preparation.

FEATURES
- Animal free source of origin: Recombinant human trypsin expressed in E. coli.
- High purity: ≥ 95%; purified by high pressure liquid chromatography

APPLICATIONS
- Trypsin (Human, Recombinant) can be used to make cell-dissociation reagents.
- It can be used for digestion of peptide and proteins for sequencing.

Cat. No. Description Size
---
786-1253 Trypsin (Human, Recombinant) 1 mg
786-1254 Trypsin (Human, Recombinant) 5 mg
786-1255 Trypsin (Human, Recombinant) 50 mg

SG-Carboxypeptidase B (Recombinant)™

SG-Carboxypeptidase B (Recombinant)™ is the rat carboxypeptidase B expressed in E. coli. Carboxypeptidase B specifically hydrolyses basic amino acids including lysine, arginine and histidine from the C-terminal end of polypeptides.

FEATURES
- Animal free source of origin, therefore no any other contaminating proteases:
- No protease inhibitors are present during preparation of SG-Recombinant Carboxypeptidase B™
- High Purity: HPLC grade; single band on SDS-PAGE; no other contaminating proteases such as chymotrypsin and carboxypeptidase A. Less than 10ppm of recombinant trypsin.

APPLICATIONS
- SG-Carboxypeptidase B (Recombinant)™ is used in sequencing protein and peptides.

Cat. No. Description Size
---
786-1249 SG-Carboxypeptidase B (Recombinant) 0.1 mg
786-1250 SG-Carboxypeptidase B (Recombinant)™ 1 mg
**Immobilized Trypsin**

Immobilized Trypsin is TPCK treated trypsin immobilized on 4% agarose that eliminates the contamination of protein digests by the trypsin. The immobilized trypsin is readily removed by separating the agarose from the digestion solution.

Trypsin is a serine endopeptidase that specifically cleaves peptide bonds on the carboxy side of s-aminoethyl cysteine, arginine and lysine residues and typically there is little or no cleavage at arginyl-proline and lysyl-proline bonds. The distribution of these residues in proteins allows trypsin digestion to produce peptides that are readily identified by mass spectrometry.

Native trypsin is prone to autolysis that results in pseudotrypsin, which exhibits a broader proteolytic specificity (a chymotrypsin like activity) and trypsin fragments that interfere with sequence analysis.

The trypsin is TPCK treated to inactive the interfering chymotrypsin activity and the resulting protein is affinity purified.

Immobilized Trypsin is supplied as a 50% slurry containing glycerol and sodium azide as a preservative.

**FEATURES**
- Eliminate contamination with trypsin
- Source: Bovine
- Activity: ≥200 TAME units/ml resin
- Support: 4% Cross-linked Agarose

**Cat. No.** | **Description** | **Size**
---|---|---
786-792 | Immobilized Trypsin | 2ml Resin

**Immobilized Papain**

A cysteine protease enzyme (EC 3.4.22.2) immobilized on 4% agarose, cleaves immunoglobulin G antibody molecules in the hinge region, generating three ~50kDa fragments; two Fab domains and a Fc domain. The papain-digested antibody is unable to promote agglutination, precipitation, opsonization, and lysis.

**FEATURES**
- Generate Fc and Fab from IgG
- Eliminates contamination with papain enzyme
- Can be used in virtually all scenarios using free papain

**CITED REFERENCES**

**Cat. No.** | **Description** | **Size**
---|---|---
786-790 | Immobilized Papain | 5ml Resin

**Immobilized Ficin**

Ficin (or Ficain) is a cysteine protease enzyme (EC 3.4.22.3) isolated from fig latex is that has the endopeptidase activity to cleave immunoglobulin G molecules in the hinge region. Ficin is typically used to cleave mouse IgG1 as this is difficult to cleave with papain and pepsin. In the presence of 1mM or 10mM cysteine, ficin generates F(ab)_2 and Fab fragments respectively. Immobilized Ficin is a convenient reagent for producing Fab and F(ab)_2 fragments as it avoids the need to remove the ficin enzyme after digestion.

**FEATURES**
- Generate Fab and F(ab')_2 fragments
- For digestion of mouse IgG1
- Eliminates contamination by Ficin

**Cited References**

**Cat. No.** | **Description** | **Size**
---|---|---
786-793 | Immobilized Ficin | 5ml Resin
**InGel™ Silver**

**In gel digestion of proteins in silver stained gels**

InGel™ Silver provides a complete set of reagents for the in gel tryptic digestion and extraction of peptides for mass spectrometry (MALDI and LC MS/MS). The kit is specifically designed for use with silver stained protein spots/bands.

The protein spots are first excised from the silver stained gel and transferred to a proteomic grade tube. Silver stained gel pieces are washed with SilverOUT™ to remove inhibitory silver ions. The protein is then alkylated and reduced within the gel piece using the supplied aliquots of DTT and iodoacetamide. The proteins are then digested within the gel using our Mass Spectrometry Grade Trypsin and proprietary Digestion Buffer.

The digested peptides are extracted with Pep-Extract™, a high diffusion peptide extraction buffer. The extracted peptides are suitable for mass spectrometry analysis without any subsequent treatments or cleaning procedures. InGel™ Silver is supplied with:

- SilverOUT™: For removal of silver ions
- OneQuant™ DTT: Reducing agent in single use aliquots to prevent contamination
- OneQuant™ Iodoacetamide: Alkylating agent in single use aliquots to prevent contamination
- Trypsin, Mass Spectrometry Grade: Highly pure, autolysis resistant trypsin
- Trypsin Digestion Buffer: For optimal trypsin activity
- Pep-Extract™: For high level peptide extraction

**FEATURES**

- For the in-gel tryptic digestion of proteins
- Compatible with silver stained proteins
- Supplied with Mass spectrometry grade trypsin
- Supplied with destaining, reducing, alkylating and peptide extraction reagents

**APPLICATIONS**

- For MALDI peptide mass mapping and for LC MS/MS

**CITED REFERENCES**


<table>
<thead>
<tr>
<th>Cat. No.</th>
<th>Description</th>
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<tbody>
<tr>
<td>786-241</td>
<td>InGel™ Silver</td>
<td>100 preps</td>
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</table>

![Figure 28: InGel™ silver scheme.](image)

**InGel™ Blue**

**In gel digestion of proteins in Coomassie and fluorescent stained gels**

Provides a complete set of reagents for the in gel tryptic digestion and extraction of peptides for mass spectrometry (MALDI and LC MS/MS). The kit is specifically designed for use with Coomassie or fluorescent stained protein spots/bands.

The protein spots are first excised from the Coomassie or fluorescent stained gel. Stained gel pieces are washed with BlueOUT™ to remove inhibitory stains. The protein is then alkylated and reduced within the gel piece using the supplied aliquots of DTT and iodoacetamide. The proteins are digested within the gel using our Mass Spectrometry Grade Trypsin and proprietary Digestion Buffer.

The digested peptides are extracted with Pep-Extract™, a high diffusion peptide extraction buffer. The extracted peptides are suitable for mass spectrometry analysis without any subsequent treatments or cleaning procedures. InGel™ Blue is supplied with:

- BlueOUT™: For removal of Coomassie or fluorescent stains
- OneQuant™ DTT: Reducing agent in single use aliquots to prevent contamination
- OneQuant™ Iodoacetamide: Alkylating agent in single use aliquots to prevent contamination
- Trypsin, Mass Spectrometry Grade
- Trypsin Digestion Buffer: For optimal trypsin activity
- Pep-Extract™: For high level peptide extraction

**FEATURES**

- For the in-gel tryptic digestion of proteins
- Compatible with Coomassie and fluorescent stained proteins
- Supplied with Mass spectrometry grade trypsin
- Supplied with destaining, reducing, alkylating and peptide extraction reagents

**CITED REFERENCES**


<table>
<thead>
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<tbody>
<tr>
<td>786-681</td>
<td>InGel™ Blue</td>
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</tbody>
</table>

**InGel™ Array**

**High throughput in gel digestion of protein spots**

96-well format kit to process larger numbers of protein spots concurrently and is compatible with spot-picking instruments.

The protein spots are first excised from the silver stained gel and transferred to a proteomic grade titer plate. Silver stained gel pieces are washed with SilverOUT™ to remove inhibitory silver ions. The proteins are then digested within the gel using a Mass Spectrometry Grade Trypsin and supplied Digestion Buffer.

The digested peptides are extracted with Pep-Extract™, a high diffusion peptide extraction buffer. The extracted peptides are suitable for mass spectrometry analysis without any subsequent treatments or cleaning procedures. InGel™ Array is supplied with:

- SilverOUT™: For removal of silver ions
- Trypsin Digestion Buffer: For optimal trypsin activity
- Pep-Extract™: For high level peptide extraction
- InGel™ Array titer plates and caps

Mass Spectrometry Grade Trypsin is available separately.

<table>
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<tr>
<td>786-241A</td>
<td>InGel™ Array</td>
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</tbody>
</table>

For further details, visit GBiosciences.com
**Protease Removal & Purification**

**Protease Removal**

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### Immobilized Soybean Trypsin Inhibitor

Immobilized Soybean Trypsin Inhibitor (STI) resin is designed for the efficient removal of trypsin, chymotrypsin and elastase proteases from protein digests. The action of the Immobilized STI resin will stop enzymatic reactions, in addition to removing the proteases and simplifying the analysis of the digested peptides.

The resin consists of the 20kDa Soybean Trypsin Inhibitor covalently coupled to agarose resin. The resin can be reused up to 10 times without significant loss in activity.

**Features**
- Binding Capacity: >6mg trypsin/ml resin
- Support: 4% Agarose
- Ligand: Soybean Trypsin Inhibitor

**Applications**
- Eliminating trypsin from protein digests
- Purification of trypsin, elastase and chymotrypsin

<table>
<thead>
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<th>Cat. No.</th>
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<td>786-843</td>
<td>Immobilized Soybean Trypsin Inhibitor</td>
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### p-Aminobenzamidine Agarose

p-Aminobenzamidine Agarose primary application is for the removal and/or purification of trypsin-like proteases. p-aminobenzamidine (PAB) is a synthetic inhibitor of trypsin-like proteases and has been covalently coupled to 6% cross-linked agarose.

p-aminobenzamidine agaroses have been used to purify a large range of specific proteins, including serine proteases.

For recombinant protein purification, the p-Aminobenzamidine Agarose can be used to remove the serine proteases (thrombin and enterothrombinase) that are used for cleavage of recombinant protein purification tags.

The p-Aminobenzamidine Agarose also contains a 6- carbon spacer arm between the p-Aminobenzamidine group and the agarose beads, making it suitable for coupling of small proteins and peptides. The long spacer arm minimizes steric hindrance allowing high efficient binding of ligands, including small proteins and peptides.

**Features**
- 90µm mean particle size
- 45-165µm particle size range
- Spherical, highly cross-linked 6% agarose
- 8-14mg trypsin/ml drained resin binding capacity
- 8µmol p-aminobenzamidine/ml drained resin ligand density
- 3-13 pH stability

**Applications**
- Removal and/or purification of trypsin, trypsin-like serine proteases.
- Removal and/or purification of zymogens, including urokinase and prekallikrein.
- Removal of thrombin and factor Xa have cleavage of tags from recombinant proteins

<table>
<thead>
<tr>
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<tr>
<td>786-692</td>
<td>p-Aminobenzamidine Agarose</td>
<td>25ml</td>
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</table>
Protein Extraction & Lysis

PROTEIN EXTRACTION & LYSIS BUFFER (PE LB™) SYSTEMS

A wide selection of protein extraction and lysis buffer systems are offered. The range includes products that maintain biological activity of proteins (PE LB™ systems), strong chaotropic extraction buffers that are 2D compatible (2D-Xtract™, FOCUS™ Extraction Buffers) and extraction systems for total proteomes (FOCUS™ Proteome kits).

Common lysis buffers (RIPA), extraction tools (grinding resins), enzymes (lysozyme and Zymolyase®), protease and phosphatase inhibitors and other extraction accessories are also offered.

Yeast PE LB™

Developed for the extraction of biologically active, soluble proteins from yeast cells. Yeast PE LB™ is a proprietary improvement on the lyticase (Zymolyase®) based spheroplast preparation and extraction of soluble proteins from yeast cell method. Based on organic buffering agents and utilizes a mild non-ionic detergent, chelating agent, and a proprietary combination of various salts and agents to enhance extraction and stability of proteins.

A ready-to-use Zymolyase® preparation is also provided. Depending on the required downstream application, additional agents such as reducing agents and protease inhibitors may be added into Yeast PE LB™. Yeast PE LB™ has been tested on several widely used yeast strains. Suitable for processing 100 x 50μl yeast cell pellets. Yeast PE LB™ buffer is also available separately.

FEATURES

• For extraction of soluble proteins from adherent and suspension cultures
• Isolation of spheroplasts

APPLICATIONS

• For extraction of soluble proteins from yeast cells

FEATURES

• For extraction of soluble proteins from adherent and suspension cultures

APPLICATIONS

• For extraction of soluble proteins from yeast cells

Mammalian Cell PE LB™

Mammalian Cell PE LB™ has been developed for extraction of total biologically active, soluble proteins from mammalian cultured cells. The Mammalian Cell PE LB™ is based on organic buffering agents and utilizes a mild non-ionic detergent, chelating agent, and a proprietary combination of various salts and agents to enhance extraction and stability of proteins. Depending on the required downstream application, additional agents such as reducing agents, phosphatase and protease inhibitors may be added into Mammalian Cell PE LB™. Mammalian Cell PE LB™ has been tested on a wide variety of mammalian cells and can be used for both suspension and adherent cells.

FEATURES

• Compatible with most enzyme assays including reporter gene assays, protein kinase assays, ATP assays, and immunoassays (ELISA, Western blots, RIA)

APPLICATIONS

• For extraction of soluble proteins from adherent and suspension animal cultured cells

CITED REFERENCES


For further details, visit GBiosciences.com
**Protein Extraction & Lysis**

### Bacterial PE LB™

**Extraction of bacterial and recombinant proteins**

For the extraction of biologically active soluble proteins, including recombinant proteins, and inclusion bodies from bacterial cells. A proprietary improvement on the lysozyme based lysis method, which allows for the extraction of soluble proteins and concurrent removal of nucleic acids (DNA & RNA) released during cell lysis. The Bacterial PE LB™ lysis eliminates viscosity build-up, allowing effective clarification with lower centrifugal forces. Based on organic buffering agents and utilizes a mild non-ionic detergent, chelating agent, and a proprietary combination of various salts and agents to enhance extraction and stability of proteins. Depending on the required downstream application, additional agents such as reducing agents and protease inhibitors may be added. Bacterial PE LB™ has been tested for use with several widely used bacterial strains.

Supplied as a kit, which includes PE LB™ Lysozyme, a modified lysozyme preparation that contains nucleases and results in optimal lysis and minimal contamination. Bacterial PE LB™ buffer is also available separately for further downstream applications.

![Image](image-url)

**APPLICATIONS**

- For the isolation of biologically active proteins
- Suitable for processing 100 x 50μl bacterial cell pellets

**FEATURES**

- Eliminates mechanical lysis and viscosity build-up
- Suitable for processing 100 x 50μl bacterial cell pellets

<table>
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<th>Cat. No.</th>
<th>Description</th>
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<tr>
<td>786-176</td>
<td>Bacterial PE LB™-Kit including PE LB™ Lysozyme</td>
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<tr>
<td>786-187</td>
<td>Bacterial PE LB™-Kit including PE LB™ Lysozyme</td>
<td>250 preps</td>
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<td>786-188</td>
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<td>786-177</td>
<td>Bacterial PE LB™ buffer only</td>
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<td>786-185</td>
<td>Bacterial PE LB™ buffer only</td>
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<td>786-186</td>
<td>Bacterial PE LB™ buffer only</td>
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<td>786-189</td>
<td>Bacterial PE LB™-2X buffer only</td>
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<tr>
<td>786-191</td>
<td>Bacterial PE LB™-Phosphate Buffer</td>
<td>500ml</td>
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</table>

### Tissue PE LB™

Developed for extraction of total biologically active, soluble proteins from animal tissues. Tissue PE LB™ is based on an organic buffer and utilizes a mild non-ionic detergent, chelating agent, and a proprietary combination of various salts and agents to enhance extraction and stability of proteins. Depending on the required downstream application, additional agents such as reducing agents and protease inhibitors may be added. Suitable for a wide variety of fresh and frozen animal tissues.

**FEATURES**

- Compatible with most enzyme assays including reporter gene assays (β-galactosidase, luciferase, chloramphenicol acetyltransferase), kinases (protein kinase C, protein kinase A, tyrosine kinase) & immunooassays (ELISA, Western blots, RIA)

**APPLICATIONS**

- Soluble protein extraction from fresh and frozen animal tissue
- Suitable for most applications including enzyme and protein purification applications, electrophoresis, Western blotting and 2D-gel analysis

**CITED REFERENCES**


More citations available at www.gbiosciences.com

For further details, visit GBiosciences.com
Insect PE LB™

Insect PE LB™ has been developed for extraction of total biologically active, soluble proteins from adherent or suspension cultured insect cells, including SF9 and SF21. Insect PE LB™ utilizes a mild non-ionic detergent and a proprietary combination of various salts and agents to enhance extraction and stability of proteins. The Insect PE LB™ is fully compatible with downstream processes, such as electrophoresis and chromatography. Depending on the required downstream application, additional agents such as reducing agents and protease inhibitors may be added into Insect PE LB™.

FEATURES
• Provides a simple and versatile method for protein extraction from adherent or suspended SF9 and SF21 insect cells
• Compatible with electrophoresis and chromatographic applications

APPLICATIONS
• For extraction of soluble proteins from cultured insect cells
• Suitable for most applications including enzyme and protein purification applications, electrophoresis, Western blotting and 2D-gel analysis

Total Protein Extraction (TPE™)

For the extraction of total protein from cells & tissues for SDS-PAGE analysis

Universal lysis system for the solubilization of total proteins from animal, plant, yeast, bacteria, and other biological samples. Samples are ground in the buffer provided and then heated to solubilize the total protein.

The TPE™ kit provides a two component protocol that eliminates clump formation, protein loss, and other problems associated with total protein extraction procedures.

The TPE™ kit is based on optimized concentration of Tris and SDS and is suitable for running denaturing electrophoresis and other downstream applications.

FEATURES
• Ready-to-use buffers for extraction of total protein
• Two component extraction protocol
• Based on an optimized concentration of Tris and SDS
• Supplied with sufficient reagents for 50 x 250mg preparations

APPLICATIONS
• Solubilization of total proteins for electrophoresis & more

CITED REFERENCES

Cat. No. Description Size
786-225 Total Protein Extraction (TPE™)-Kit 50 preps

IBS™ Buffer

Inclusion bodies solubilization buffer

The IBS™ buffer is specifically developed for solubilization of inclusion bodies.

Simple to use protocol as inclusion bodies are suspended in IBS™ Buffer, where they readily dissolve releasing the proteins of interest. Once the inclusion bodies are solubilized, the sample is ready for further analysis and other downstream applications. Supplied with optional DTT.

We offer IBS-HP™ Buffer for the solubilization of inclusion bodies containing highly hydrophobic proteins.

CITED REFERENCES

Cat. No. Description Size
786-183 IBS™ Buffer Kit 100ml
786-183HP IBS-HP™ Buffer Kit 100ml

RIPA Lysis & Extraction Buffer

A complete lysis buffer for the release of cytoplasmic, membrane and nuclear proteins from adherent and suspension cultured mammalian cells. The RIPA lysis buffer is fully compatible with many applications, including reporter assays, protein assays, immunoassays and other protein purification techniques.

RIPA Lysis Buffer does not contain protease inhibitors, however it is fully compatible with our range of individual protease inhibitors and cocktails.

CITED REFERENCES

Cat. No. Description Size
786-411 Insect PE LB™ 250ml
786-411HP IBS™ Buffer Kit 100ml

For further details, visit GBiosciences.com
**FOCUS™ PROTEOME KITS**

*Isolate total proteomes from various species*

An effective proteome analysis requires the preparation of a sample to bring the wide range of protein species into the dynamic range of detection. The absence of any standardized procedures for sample preparation has made proteome analysis extremely complicated, requiring a multitude of complicated skills, expensive equipment, and resources.

**FOCUS™ Proteome Kits for total proteome preparation**

**FOCUS™ Yeast Proteome**

Specifically designed for yeast research and supplied with yeast specific reagents. Extracts and solubilizes nearly all of the proteins from yeast, including membrane and soluble proteins. Extraction is based on gentle lysis of yeast cells with a yeast lytic enzyme preparation, LongLife™ Zymolyase®, which has improved stability and shelf life. Enzymatic action is followed by extraction of total proteome with the supplied strong chaotropic extraction buffer that solubilizes even the most difficult proteins.

**FEATURES**
- Single step extraction protocol
- Supplied with a strong, chaotropic extraction buffer
- Supplied with yeast specific lytic enzyme preparation and a strong proprietary chaotropic extraction buffer
- Suitable for sample preparation for 2D gel electrophoresis

**APPLICATIONS**
- Suitable for sample preparation for 2D gel electrophoresis and other applications

**CITED REFERENCES**


---

**FOCUS™ Insect Proteome**

Extracts and solubilizes nearly all of the proteins from insect cell cultures (i.e. Sf9 and Sf21), including membrane as well as soluble proteins, using a strong chaotropic extraction buffer to solubilize even the most difficult proteins.

**FEATURES**
- Single step extraction protocol
- For the extraction of protein from 50 x 50μl insect cell pellets

**APPLICATIONS**
- For 2D gel electrophoresis and other applications

**FOCUS™ Plant Proteome**

Specifically designed for plant research and supplied with plant specific reagents. Extracts and solubilizes nearly all of the proteins from plants, including membrane as well as soluble proteins. Extracts plant proteome from 25 x 0.5gm plant tissue preparations

**FEATURES**
- Simple extraction protocol
- Supplied with reagents for removal of plant pigments and other natural products that may interfere with protein analysis
- Supplied with a proprietary chaotropic extraction buffer
- Extracts plant proteome from 25 x 0.5gm plant tissue preparations

**APPLICATIONS**
- Suitable for sample preparation for 2D gel electrophoresis and other applications

**CITED REFERENCES**


---

**FOCUS™ Mammalian Proteome**

Extracts and solubilizes nearly all of the proteins from mammalian samples, including membrane as well as soluble proteins, by a strong chaotropic extraction buffer to solubilize even the most difficult proteins. Suitable for biological samples from animal tissues and adherent and suspension cells.

**FEATURES**
- Single step extraction protocol
- Supplied with a strong, chaotropic extraction buffer
- For 50 x 100mg animal tissue or 50μl wet cell pellets

**APPLICATIONS**
- Extraction of total proteins from mammalian tissues and cells
- Sample preparation for 2D gel electrophoresis

**CITED REFERENCES**

DENATURING EXTRACTION BUFFERS

FOCUS™ Extraction Buffers

Chaotropic extraction buffers that preserve the native charge of proteins

One of the most important considerations before running 2D gel electrophoresis is the choice of protein solubilization buffers. The suitable buffer must solubilize proteins effectively, without disturbing the native charge of the proteins. Urea, a common chaotrope, is widely used for solubilization and denaturation of proteins. One of the disadvantages of using urea is carbamylation. Urea in water exists in equilibrium with ammonium cyanate, the level of which increases with increasing temperature and pH. Cyanate reacts with α-amino and ε-amino groups of proteins and induces a change in the isoelectric point of proteins. This leads to artifactual results and therefore carbamylation must be avoided.

One way to minimize the risk of carbamylation is to prepare the urea based reagents fresh before each use. G-Biosciences has developed a series of dry urea based pre-mixed and ready-to-use solubilization buffers. Simply add an appropriate volume of the supplied rehydration buffer to the dry buffer and then use to solubilize proteins, saving time and improving the quality of IEF/2D gel electrophoresis.

FOCUS™ Extraction Buffers are also designed to be used as rehydration buffers for IPG strips.

FOCUS™ Extraction Buffers are experimentally optimized concentrations of critical agents, buffering and stabilizing agents, including urea, thiourea, Nonidet® P-40, CHAPS, and sulfobetaines (SB). The FOCUS™ Extraction Buffers are designed to produce optimal protein extraction and improved spot resolution for 2D gel analysis.

A range of FOCUS™ Extraction Buffers have been developed and depending on the nature of the samples, one or more of the buffers suitable for your applications can be ordered. FOCUS™ Extraction Buffer-I is suitable for most applications, however for stronger solubilization effects, we recommend FOCUS™ Extraction Buffer-II, -III, -IV, -V or -VI.

For analysis of a proteome, a single buffer may not be suitable and sequential solubilization using different FOCUS™ Extraction Buffers will help in identifying new proteins.

FEATURES

• Convenient and simple to use extraction buffers
• Simply hydrate and use
• Prevents urea induced protein carbamylation
• Prevents waste of unused reagents

APPLICATIONS

• Suitable for sample extraction and solubilization for 2D gel electrophoresis and other application

CITED REFERENCES


<table>
<thead>
<tr>
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<tr>
<td>786-220</td>
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<td>786-221</td>
<td>FOCUS™ Extraction Buffer II</td>
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<td>FOCUS™ Extraction Buffer VI</td>
<td>For 50ml</td>
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<tr>
<td>786-234</td>
<td>FOCUS™ Extraction Buffers I-VI Trial kit</td>
<td>For 10ml each buffer</td>
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**Molecular Grinding Resin™**

**Available with matching pestles & tubes**

Molecular Grinding Resin™ is ideal for grinding small samples and the subsequent preparation of proteins and nucleic acids. The resin consists of high tensile micro particles, which effectively disrupt nuclei and other cellular organelles. The resin is fully compatible with any homogenization technique, including high speed mechanical grinders and sonicators.

Molecular Grinding Resin™ does not bind proteins or nucleic acids, minimizing loss. Simply mix the Molecular Grinding Resin™ with the biological samples and grind or homogenize the sample.

Supplied with enough resin for 200 isolations from 100mg tissue.

**CITED REFERENCES**


More citations available at www.gbiosciences.com

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<thead>
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<th>Cat. No.</th>
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**Protein Extraction Accessories**

**LongLife™ Enzyme Preparations**

Enzymes regularly used in laboratory applications often require preparation of fresh solution before each use. Making fresh enzyme solution for each application is time consuming and wasteful. A wide variety of enzyme preparations in a ready-to-use format are offered.

**LongLife™ enzyme preparations** have a long shelf life and no weighing or buffer preparation is needed; simply take an aliquot and add to your sample. LongLife™ enzyme preparations contain cofactors necessary for optimal enzymatic activity. Supplied in suspension form and when stored properly have a one year shelf life.

**ENZYMES OFFERED**

- LongLife™ Zymolyase®: digestion of yeast & fungal cell walls
- LongLife™ Lysozyme: digestion of bacterial cell walls
- LongLife™ Proteinase K: digestion of proteins in nucleic acid preparations
- LongLife™ Nuclease: removal of nucleic acids
- LongLife™ RNase: digestion of RNA
- LongLife™ DNase: digestion of DNA

**CITED REFERENCES**


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<td>LongLife™ Zymolyase® [1.5U/µl]</td>
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