

Integrated Solutions for Recombinant Protein Extraction and Stabilization

Reference and Selection Guide

BACTERIAL

MAMMALIAN

PLANT

YEAST

*Efficiently Extract
Protein*

*Preserve Protein
Function*

*Prevent Protein
Degradation*

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 **SIGMA**[®]

Protease and Phosphatase Inhibitor Cocktails

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Sample Type	General Use		Bacterial	Mammalian	Plant	Yeast	Histidine-tagged Proteins	Tissue Culture Media	Phosphatase Inhibitors	
									Tyrosine/Alkaline	Serine/Threonine
Catalog Number	P2714	NEW S8820	P8465	P8340	P9599	P8215	P8849	P1860	P5726	P2850
Specificity of Inhibition	Serine, Cysteine, Aspartic & Metalloproteases	Serine, Cysteine, Aspartic, & Metalloproteases	Serine, Cysteine, Aspartic, & Metalloproteases Aminopeptidases	Serine, Cysteine, Aspartic Proteases & Amidopeptidases	Serine, Cysteine, Aspartic and Metalloproteases, Aminopeptidases	Serine, Cysteine, Aspartic and Metalloproteases	Serine, Cysteine, Aspartic and Thermolysin-like Proteases & Aminopeptidases	Serine, Cysteine, Aspartic proteases & Aminopeptidases	Acid and Alkaline Phosphatases, as well as Tyrosine Protein Phosphatases	Serine, Threonine Phosphatases and various isozymes of Alkaline Phosphatase
Cocktail Format	Water soluble lyophilized powder	Water or buffer soluble tablet	Lyophilized powder with a vial of DMSO	Solution in DMSO	Solution in DMSO	Solution in DMSO	Solution in DMSO	Solution in DMSO	Solution in water	Solution in DMSO
Usage (amount of sample that 1 ml of cocktail will inhibit) Typically enough for 100 ml of cell lysate, depending on cell type	1 mg of USP pancreatin; typically enough for 100 ml of cell lysate	1 mg of USP pancreatin (1x solution), One tablet generates 100 ml of protease inhibitor solution	20 ml of cell lysate from 4 g (wet weight) of <i>E. coli</i> cells	100 ml of cell lysate from 20 g (wet weight) of bovine liver or 10 ml of cell lysate from CHO cells at 10 ⁸ cells per ml	100 ml of cell lysate from 30 g (wet weight) of plant tissue	100 ml of cell lysate from 20 g (wet weight) of <i>Saccharomyces cerevisiae</i> cells	100 ml of cell lysate from 20 g (wet weight) of <i>E. coli</i> cells or 10 g (wet weight) of baculovirus infected cells	Dilution of ≥1:200 in tissue culture media to prevent proteolytic degradation of secreted proteins	100,000 x g supernatant from human placenta, bovine liver, rabbit muscle, A431 or Jurkat cell extracts at a protein concentration of approximately 5 mg/ml	
Cocktail Components (and concentrations when available)	AEBSF, 2 mM Aprotinin, 0.3 μM Bestatin, 130 μM EDTA, 1 mM E-64, 14 μM Leupeptin, 1 μM	AEBSF, 2 mM Aprotinin, 0.3 μM Bestatin, 130 μM EDTA, 1 mM E-64, 14 μM Leupeptin, 1 μM	AEBSF, 23 mM Bestatin, 2 mM EDTA, 100 mM E-64, 0.3 mM Pepstatin A, 0.3 mM	AEBSF, 104 mM Aprotinin, 80 μM Bestatin, 4 mM E-64, 1.4 mM Leupeptin, 2 mM Pepstatin A, 1.5 mM	AEBSF Bestatin E-64 Leupeptin Pepstatin A 1,10-Phenanthroline	AEBSF, 100 mM E-64, 1.4 mM Pepstatin A, 2.2 mM 1,10-Phenanthroline, 500 mM	AEBSF Bestatin E-64 Pepstatin A Phosphoramidon	Aprotinin Bestatin E-64 Leupeptin Pepstatin A	Imidazole Sodium Molybdate Sodium orthovanadate Sodium Tartrate	Bromotetramisole Cantharidin Microcystin LR
Additional Special / Specific Applications (Tested on but not limited to)	Optimized and tested for general use	Optimized and tested for general use	Various <i>E. coli</i> strains	Use at 1:100 for undiluted blood samples, liver tissue extracts, CHO cell lysates	Tested on extracts from kidney bean, pea, wheat, tobacco, and <i>Arabidopsis</i>	<i>Saccharomyces cerevisiae</i> cells	<i>E. coli</i> cells; baculovirus-infected <i>Spodoptera frugiperda</i> pupal ovary cells	After 48 hours in medium, add fresh inhibitors in fresh medium	Tested on various animal tissues (bovine liver, human placenta, rabbit muscle) and A431 and Jurkat cell lines	Tested on various animal tissues (bovine liver, human placenta, rabbit muscle) and A431 and Jurkat cell lines
Storage and Stability (unopened)	-20 °C ≥ 4 years	2-8 °C ≥ 4 years	-20 °C ≥ 4 years	At least 4 years at -20 °C; 8 months at 2-8 °C; and 2 months at RT	At least 4 years at -20 °C; 8 months at 2-8 °C; and 2 months at RT	At least 4 years at -20 °C; 8 months at 2-8 °C; and 2 months at RT	At least 4 years at -20 °C; 3 months at 2-8 °C; and 2 weeks at RT	At least 4 years at -20 °C; 8 months at 2-8 °C; and 2 months at RT	2-8 °C ≥ 2 years	2-8 °C ≥ 4 years

Coming Soon! SigmaFAST™ Protease Inhibitor Tablet for General Use (Cat. No. S8820)

Protease and Phosphatase Inhibitors *Available Individually*

Protease Inhibitors	Cat. No.	Application
AEBSF	A8456	Inhibits serine proteases, such as trypsin and chymotrypsin
Aprotinin saline solution Aprotinin, affinity purified	A6279 A4529	Inhibits serine proteases such as trypsin, chymotrypsin, plasmin, trypsinogen, urokinase, and kallikrein. Also inhibits human leukocyte elastase, but not pancreatic elastase
Bestatin, hydrochloride	B8385	Inhibits aminopeptidases, such as leucine aminopeptidase proteases
Cantharidin	C7632	Inhibits protein phosphatase 2A (PP-2A)
Chymostatin	C7268	Inhibits serine and cysteine proteases
E-64	E3132	Inhibits cysteine proteases such as calpain, papain, and cathepsin B
EDTA disodium salt dihydrate EDTA, 0.5 M solution disodium salt	E5134 E7889	Inhibits metalloproteases; chelates; permeabilizes Gram-negative bacteria
EGTA	E8145	Inhibits metalloproteases; chelates
Imidazole	I0125	Inhibits alkaline phosphatases
Leupeptin hemisulfate Leupeptin, TFA salt Leupeptin hydrochloride	L2884 L2023 L9783	Inhibits both serine and cysteine proteases such as calpain, trypsin, papain, and cathepsin B
Microcystin LR	M2912	Inhibits protein phosphatases 1 and 2A (PP-1 and PP-2A)
Pepstatin A Pepstatin A, 90% pure	P4265 P5318	Inhibits acid proteases such as pepsin (human or porcine), renin, cathepsin D, chymosin (bovine rennin), and protease B
1,10-Phenanthroline	P9375	Inhibits metalloproteases
Phosphoramidon	R7385	Inhibits thermolysin and collagenase
PMSF	P7626	Inhibits serine proteases
Sodium molybdate	M1003	Inhibits acid and phosphoprotein phosphatases
Sodium orthovanadate	S6508	Inhibits a number of ATPases, protein tyrosine phosphatases, and other phosphate-transferring enzymes
Sodium tartrate	S4797	Inhibits alkaline phosphatases

Organism


BACTERIA

WHOLE CELL DETERGENT LYSIS

WHOLE

Product	CellLytic™ B	CellLytic B 2x	CellLytic B 10x	CellLytic Express
Catalog number	B7435	B7310	C8740	C1990
Description	A ready-to-use solution containing 40 mM Tris-HCl, pH 8, and a proprietary, non-denaturing detergent formulation of zwitterionic detergents	A more concentrated (2x), ready-to-use solution containing 40 mM Tris-HCl, pH 8, and a proprietary, non-denaturing formulation detergent	A highly concentrated (10x) solution containing a proprietary, non-denaturing detergent formulation and no buffering components	A ready-to-use, all-in-one, non-denaturing proprietary powder formulation of detergent and enzymes optimized for one-step extraction of proteins from bacterial cells (in-culture cell lysis)
Package sizes	50 ml, 500 ml (Sufficient for processing 5 g and 50 g of wet cell paste, respectively)	50 ml, 250 ml (Sufficient for processing up to 10 g and 50 g of wet cell paste, respectively)	10 ml, 50 ml, 100 ml (Sufficient for processing ~10 g, 50 g, and 100 g of wet cell paste, respectively)	25 ml (1.26 g) 10 x 25 ml 6 x 500 ml (25.2 g)
Sample type	<ul style="list-style-type: none"> Bacterial cell pellets (lysis and protein extraction) Isolation of inclusion bodies 	<ul style="list-style-type: none"> Bacterial cell pellets (concentrated at 2x for more difficult to lyse organisms) Isolation of inclusion bodies 	<ul style="list-style-type: none"> Bacterial cell pellets (concentrated at 10x in water; dilute for use into buffer of choice) Isolation of inclusion bodies 	<ul style="list-style-type: none"> Direct lysis of bacterial cell cultures (without centrifugation) Affinity purification of proteins without the need for special equipment
Strain/Cell line compatibility	<ul style="list-style-type: none"> Optimized for <i>E. coli</i> strain BL21 DH5α JM109 Other similar cells 	<ul style="list-style-type: none"> Optimized for <i>E. coli</i> strain BL21 DH5α JM109 Other similar cells 	<ul style="list-style-type: none"> Optimized for <i>E. coli</i> strain BL21 DH5α JM109 Other similar cells 	<ul style="list-style-type: none"> Optimized for <i>E. coli</i> strain BL21 DH5α JM109 Other similar cells
Usage	<u>Small scale:</u> 0.4 ml of CellLytic B per 1.5 ml culture pellet <u>Large scale:</u> 10-20 ml per g of wet cell paste	<u>Small scale:</u> 0.2 ml of CellLytic B 2x per 1.5 ml of culture pellet <u>Large scale:</u> 5 ml per g of wet cell paste	Test 5, 10, and 20-fold dilutions into the desired buffer; add diluted solution at 10-20 ml per g of wet cell paste	<u>Small scale:</u> one 25 ml bottle per 25 ml of culture <u>Large Scale:</u> one 500 ml bottle for 500 ml of culture *For cultures <25 ml, add 0.05 g of powder per ml of culture
Type of detergent/ Dialyzable?	Zwitterionic/Yes	Zwitterionic/Yes	Zwitterionic/Yes	Zwitterionic/Yes
Protein active?	Yes – Suitable for protein activity assays	Yes – Suitable for protein activity assays	Yes – Suitable for protein activity assays	N/A; typically resin-bound protein-activity dependent on isolation/elution methods
Compatible purification and detection products	<ul style="list-style-type: none"> Antibody/EZview™ Affinity Gels FLAG® HIS-Select™/IMAC GST Protease Inhibitor Cocktails Lysozyme solution (L3790) 	<ul style="list-style-type: none"> Antibody/EZview Affinity Gels FLAG HIS-Select/IMAC GST Protease Inhibitor Cocktails Lysozyme solution (L3790) 	<ul style="list-style-type: none"> Antibody/EZview Affinity Gels FLAG HIS-Select/IMAC GST Protease Inhibitor Cocktails Lysozyme solution (L3790) 	<ul style="list-style-type: none"> Antibody/ EZview™ Affinity Gels FLAG® HIS-Select™/IMAC GST Protease Inhibitor Cocktails Lysozyme solution (L3790)
Quantitation and staining capabilities	<ul style="list-style-type: none"> Protein assay Protein staining 	<ul style="list-style-type: none"> Protein assay Protein staining 	<ul style="list-style-type: none"> Protein assay Protein staining 	<ul style="list-style-type: none"> Protein assay Protein staining
Applications	<ul style="list-style-type: none"> Affinity purification SDS-PAGE Western blotting Dot blotting Immunoprecipitation 	<ul style="list-style-type: none"> Affinity purification SDS-PAGE Western blotting Dot blotting Immunoprecipitation 	<ul style="list-style-type: none"> Affinity purification SDS-PAGE Western blotting Dot blotting Immunoprecipitation 	<ul style="list-style-type: none"> Affinity purification SDS-PAGE Western blotting Dot blotting Immunoprecipitation
Related products containing this reagent	See CB0050 & CB0500 kits	See B7435 & CB0500 kits	See B7435 & CB0500 kits	CellLytic Express Tablets (C5491)
Physical form	Ready-to-use solution	Concentrated solution (2x)	Concentrated solution (10x)	Easy-to-dissolve powder
Storage and stability	Room temperature 2 years	Room temperature 2 years	Room temperature 2 years	–20 °C 2 years

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