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Isolation, Extraction Solutions from Interchim

Biomolecules extraction from complex biological samples (tissues, cells) using a variety of techniques. This section focuses on
- chemical extraction with the help of detergents/chaotropes/solubilizing agents, but also required additives.
- convenient formulated buffers and kits for the extraction from any kind of materials (bloods, plants, bone,…).

See also the catalog « Cell recovery » [LS-B0000c] for processes upstream extraction (i.e. exosome fractionnation),
the catalogs « Biopurification », incl. affinity purification tools for specific isolation, purification and dessalting [LS-B0000c]
the catalogs of assays to, dowstream extraction, monitor or analyze (quantitate or characterize) extracted materials [LS-B0000c].

Detergents

Introduction – selection guide

Technical tip - Detergents, general information
Detergents are water-soluble molecules classified according to their hydrophilic/ hydrophobic character and ionic groups. This effectively drives the pattern of protein/ detergents interactions. Notably their hydrophobic tail associates to form micelles, or aggregates, or interacts with other molecules (lipids, proteins). Detergents are used at 3 essential steps in biochemistry of proteins: extraction, storage, and analysis : ! Proteins are usually extracted by lysis of the cells and tissues in presence of detergents (SDS, Triton® X100, X114, CHAPS, DOC, NP40, OctylThioGlucosides) that disorganize the membranes lipidic bilayer, and solubilized proteins. Non-solubilized material is harvested by centrifugation or other means.
* In solution, detergents help keeping molecules in solution, by dissociating aggregates, increasing solubility, and unfolding proteins. The nature of compounds to solubilize require to test various types of detergents, more or less suitable, and in particular in cristallogenesis (see section crystallography), notably for proteins sensitive to undesired denaturation, as integral membrane proteins (PIM; transporters, channels, receptors, enzymes and cell-adhesion protein)
* For electrophoresis i.e., proteins are classically treated with SDS to denature the native tertiary and quaternary structures, allowing the separation of proteins according to their molecular weight.

●Our detergents are available in several grades* suitable for following applications :
Biotech grade (BTG) detergents have controlled and high enough quality to suit many lab research applications; including biochemistry, proteomics as well genomics. Now, other grades can be used, and in most demanding applications, higher or specific grades can be required. **Molecular Biology grade** (MBG) is very close t oBTG, recommended typically for molecular biology works, notably genomics, while **UltraPure grade** may provide lower traces amounts, but are not tested for proteases. **Proteomics grade** (PMG) surely fits the highest requirements of the proteomic research: i.e. during extraction, purification, storage, and analysis (electrophoresis, bioassay…).We have also an **Oxidant Free grade** (OFG) with special purification process and packaging, for detergents that are prone to generate oxidative compounds upon ageing, the latter being deleterious to labile or sensible biomolecules activity (such as many receptors, enzymes…).

●Properties and applications

Cat.#	Detergent	Type	PM	Aggregation Number	Micelle PM	CMC (mM)	HLB (mM)	Cloud pt (°C)	Common Applications
UP09187	Brij-35	non-ionic	~1225	40	49k	0,05-(0.09)-0.1	16.9	>100	SMP, Chrom&Electr.
UP31473	Brij-56	non-ionic	~683	a	.	.	.	.	.
UP31474	Brij-58	non-ionic	~1120	70	82k	0.04-(0,07)-0.08	15.7	>100	.
N14240	Deoxy-BigCHAP	non-ionic	862.1	.	.	1.1-1.4			
N14100	BigCHAP								
N14260	Mega-8	non-ionic	321.4	.	.	58			
N14230	Mega-9	non-ionic	335.5	.	.	19-25			
N14220	Mega-10	non-ionic	349.5	.	.	6-7			
098665	Pluronic F-68	non-ionic	~8300	.	.	0.006			
764831	Sucrose MonoLaurate	non-ionic	524.6	.	.	0.4			
11966B	Digitonin	non-ionic	1229.3	5-6	.	.	.	.	.
UP01838	Guanidine	-	-	-	-	-	-	-	-
UP78548	Hecameg	non-ionic	335.4	.	.	19.5	.	.	SMP (receptors)
24637	Nonidet P-40	non-ionic	602	149	90k	0.5-(0.29)-0.3	13.1	80	SPM, Chrom&Electr.
UP60207	n-nonyl-b-D-glucopyranoside	non-ionic	306.4	.	.	6.5	.	.	
UP26370	n-octyl-b-D-glucopyranoside	non-ionic	292.4	84	7.9k	20-(25)-30	.	>100	SMP, Anal., Immunol..
UP60208	n-octyl-b-D-thioglucopyranoside	non-ionic	308.4	9	.	.	.	>100	SMP (mild), Enz.
UP42613	n-decyl-b-D-maltopyranoside	non-ionic	482.6	.	.	1.8	.	.	
UP34675	n-dodecyl-b-D-maltopyranoside	non-ionic	510.6	98	.	0.1-(0.17)-0.6	.	.	SMP, Anal., Enz., Chrom&Electr.
UP55205	n-undecyl-b-D-maltopyranoside	non-ionic	496.6	0.59	.	.	.	.	
UP52112	Triton X-100	non-ionic	Av.646	100-155	90k	0.2-(0,23)-0.9	13.5	64	SMP, Extraction, all purpose
UP15852	Triton X-114	non-ionic	Av.536	.		0.17-0.35	12.4	23	SMP, Enz.
UP15874	Tween 20	non-ionic	Av.1227	.	.	0.059	16.7	95	Immunol. Solub.Anal
UP15878	Tween 80	non-ionic	Av.1310	60	76k	0.012	15	.	Immunol. Stabil.IgM
258166	N-Laurylsarcosin Na salt	anionic	293.4	.	.	13.7	.	.	
259845	Lithium Dodecyl Sulfate	anionic	272.3	.	.	8.7	.	.	
WZ7830	Sodium Cholate	anionic	430.6	.	.	14	.	.	
UP11708	Sodium DeOxyCholate	anionic	414.6	.	.	10	.	.	
UP64910	SDS (Sodium Lauryl Sulfate)	anionic	288.4	.	.	7-10	.	.	
UP11708	DOC	anionic	414.6	5	2k	1.5	-	-	-
UP89682	SDS	anionic	288.5	62	18-24k	7-10	40	>100	Electroph., SMP
25552A	Cetylpyridinium chloride	cationic	358.0	.	.	0.12	.	.	
12910A	CetylTriMethylAmonium Bromide	cationic	364.5	.	.	1	.	.	
UP33351	CHAPS	zwitterionic	614.9	4-14	6.1k	6-(8)-10	-	>100	SMP, Anal., Enz., Chrom&Electr.
UP35639	CHAPSO	zwitterionic	630.9	10	6.1k	8	>100	.	SMP, Anal., Enz., Chrom&Electr.
N14150	SulfoBetaiine SB10	zwitterionic	307.6	.	.	25-40	.	.	
N14160	SulfoBetaiine SB12	zwitterionic	335.6	.	.	2-4	.	.	
	SulfoBetaiine SB14	zwitterionic	363.6	.	.	0.2	.	.	
	SulfoBetaiine SB16	zwitterionic	391.6	.	.	0.01-0.06	.	.	
UP03190	Urea	chaotrope	60.06	.	.	.	.	.	Electroph

Notes : SMP = Sample Preparation, Enz. = enzymatic studies, Anal. = Analytical techniques, Chrom&Electr = Chromatography and Electrophoresis analysis.

■ Detergent Powders

Following are selected popular detergents that are used for proteins extractions (as Brij, Triton DOC, NP40,..., but also demanding protein applications such as Sulfobetains/NDBS, BigCHAP, Hecameg,...), for DNA extractions (urea,..), electrophoresis (SDS), or crystallisation.

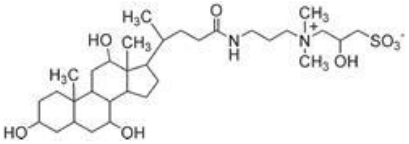
CHAPS family in protein extraction and purification:
In the past, polyoxyethylene ether non-ionic detergents were widely used. These detergents, however, had several problems, such as denaturation of proteins and low CMC value, which cannot be separated easily by dialysis. n-Octyl-β-D-glucoside, n-Octyl-β-Dthioglucoside, CHAPS, and CHAPSO eliminate these problems and are widely used today. Most of the current detergents are non-ionic and easily applied to ion exchange chromatography purification.

CHAPS and CHAPSO are zwitterionic detergents (electronically neutral) that are very popular, being found to protect the native state of proteins and easily removed by dialysis.. They have a cholic acid and sulfobetaine moieties in their structures. Their low background absorbance in the UV region is an attractive feature for the UV monitoring of membrane proteins. The CMC values of both CHAPS and CHAPSO are 8 mM.

BigCHAP and deoxy-BigCHAP are non-ionic detergents based on a cholic acid and a gluconamide polar group. The CMC values are 2.9 mM and 1.4 mM, respectively. BIGCHAP and deoxy-BIGCHAP are easily removed by dialysis, and their absorption in the UV region is very low. deoxy-BIGCHAP has been used for the extraction of many delicate proteins, i.e. opioid receptors, adenylate cyclase ; acetyltransferase. It has low UV absorbance, hence it can be used for the determination of proteins.
These detergents are also widely used to solubilize chromophores or to stabilize enzymes in diagnostic analyses and biochemical assays.

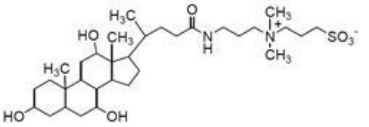
CHAPS 33351:
A non-denaturing, zwitterionic detergent for membrane proteins

Purity	> 99%
Conductivity (10%, Water)	~50 umhos
pH (10%, Water) @25C	5.0 - 7.0
Residue on Ignition	<0.1%



CHAPSO 35639:

Abs.@260nm (1%, Water)	< 0.05
Conductivity (0.5M, Water)	~100umhos
Moisture (KF)	<7.5%
pH (1%, Water) @25C	5.0 - 9.0
Residue on Ignition	<0.1%



Big CHAP — **N14100 5 g**
N,N-Bis[3-D-Gluconamido-Propyl]Cholamide; CAS: 86303-23-3; MW: 740 — TS

BRIJ-35 Biotech grade — **09187A 1 Kg** — **09187B 5 Kg**
CAS: 9002-92-0 — TS
BRIJ-35 Proteomics grade — **09187K 1 Kg** — **09187L 5 Kg**

C12 E8 — **N14210 1 g**
Octaethyleneglycol Mono-N-Dodecyl Ether ; CAS: 3055-98-9; MW: 538.77 — TS
C12 E9 — **N14510 1 g**
Nonaethyleneglycol Mono-N-Dodecyl Ether; CAS: 3055-99-0; MW: 582.82 — TS

CDMEA — **25552A 100 g** — **25552B 500 g**
CetylDiMethylEthylAmmonium Bromide; CAS: 124-03-8; MW: 378.49 — TS
P.
CTAB — **12910A 500 g** — **12910B 1 Kg**
CetylTriMethylAmmonium Bromide ; CAS: 57-09-9; MW: 364.46 — TS

CHAPS, UltraPure — **UP333514 5 g** — **UP33351A 25 g** — **333515 100 g**
3-[(3-Cholamidopropyl)dimethylammonio]-1-propanesulfonate, CAS : 75621-03-3; MW: 614.89 — Technical Sheet
CHAPS, Proteomics grade — **33351K 5 g** — **UP33351L 10 g** — **UP33351M 50 g**
DNas/RNase free

CHAPSO, UltraPure — **UP356392 1 g** — **UP356393 5 g**
3-[(3-Cholamidopropyl)dimethylammonio]-2-hydroxy -1-propanesulfonate; CAS:82473-24-3; MW: 630.89 — TS
CHAPSO, Proteomics grade — **35639B 1 g** — **35639C 10 g** — **35639D 50 g**
Protease free ; Abs 260nm <0.05 ; C(0.5M) <1000umhos — TS

Cholate, Sodium salt — **WZ7830, 25g**
anionicdetergetn; 430.6

Deoxy Big CHAP - High Purity grade — **N14240 500 mg**
CAS:86303-23-3 MW: 834.02
Deoxycholic Acid (DOC), Sodium Salt — **UP11708D 10 g** — **UP11708E 50 g** — **11708B 100 g**
CAS:302-95-4 MW: 441.57 — TS
P.: >99% ; devoid of C16, UV absorbing substances. Heavy metals and chloride. Heavy metals : < 0.005% . Sodium Cholate < 2%
Devoid of contaminants that may affect the renaturation of proteins, the detection sensitivity by UV and separations and enzymatic activities
Dodecyltrimethylammonium Chloride — **N12850 100 ml** — **N12851 500 ml**
50% solution in alcohol. P.: >99% MW: ~263 — TS

Hecameg — **785480, 5g**
6-O-(N-Heptylcarbamoyl)-methyl-α-D-glucopyranoside; CAS : 115457-83-5; MW 335.4 CMS: 19.5mM — Technical Sheet

Lauryl Sarcosine, **Sodium salt,** Reagent Grade **258166, 500g** **258167, 1kg**
CAS: 137-16-6 MW: 293.39 TS
Purity: >95.0 %; Sodium Laurate: <=4%

Lithium Dodecyl Sulfate **259845 25 g** **259846 100 g** **259847 500 g**
CAS: 2044-56-6; P.: >99% MW: 272.33 TS

MEGA-8 UltraPure Grade **N14260 5 g**
Octanoyl-N-Methylglucamide; CAS: 85316-98-9; MW: 321.42 TS
MEGA-9 Ultra Pure Grade **N14230, 100mg** **N14231, 5g**
Nonanoyl-N-Methylglucamide; CAS: 85261-19-4; MW: 335.4 TS
MEGA-10 Ultra Pure Grade **N14220 5 g**
Decanoyl-N-Methylglucamide; CAS: 85261-20-7 ; MW: 349.47 TS

Nonidet P-40 Substitute **246373, 50ml** **246374, 100ml** **246375, 500ml**
Octylphenoxypolyethoxyethanol, Igepal CA-630: CAS: 9036-19-5; MW: N/A TS
Reagent Grade; Refractive index: 1.48-1.52; Density: 1.05-1.07; CCM: 0.08 mM(20-25°C); HLB: 13.1
Nonidet P-40 Substitute, Proteomics Grade **246376, 50ml** **246377, 100mg** **3465378, 500ml**
Protease free MW: N/A TS
SDS powder, Molecular Biology grade **UP649100, 500g**
Biotech grade **089387, 100g** **089388, 500g** **089389, 1kg**
Sodium Dodeocyl Sulfate; Sodium Lauryl Sulfate; MW: 288.38 Technical Sheet
Anionic detergent; Suitable for biotechnology applications, molecular biology and genomics

Example of specifications – SDS UP649100:
Excellent batch to batch reproducibility
Purity (HPLC) > 99%
Content in C12 : > 99%
Nuclease, RNase and protease free
OD260 and OD280 (3% solution in water) < 0.1
Chlorides < 0.1%
Copper, Lead < 5ppm

SDS, an anionic detergent, is a critical reagent in many molecular biology applications. It is widely known that the purity and C12 content dramatically affect the performance of this detergent. For example, contaminating levels of C16-alkyl sulfate particularly affect protein renaturation, and contaminating UV absorbing materials affect detection sensitivity. Additionally, heavy metals/chloride contaminants affect separation and enzymatic activities.

Our SDS is especially high in both purity and C12 content. This nuclease and protease free material is ideally suited for nucleic acid purification, hybridization cocktails, electrophoresis, wash buffers and protein studies.

SDS, powder, Proteomics grade **GS3750, 100g** **GS3751, 250g**
TS **GS3752, 500g** **GS3753, 1kg**
SDS, 20% (w/v) solution **UP896825, 200ml** **UP896826, 500ml** **896826, 1L**
. Technical Sheet
SDS, 20% (w/v) solution, Proteomics grade **89682A, 200ml** **89682B, 500ml** TS
Protease, DNase; RNase free

SDS, 10% (w/v) solution **N13827, 100ml** **N13828, 500ml** **N13829, 1L** Techn Sheet
SDS, 10% (w/v) solution, Proteomics grade **GS3770, 100ml** TS
Protease, DNase; RNase free

Sodium …
See chemical name, sodium salt. Ex: Cholate Sodium salt (WZ7830), Lauryl Sarcosine Sodium, salt (258166),…

Sucrose MonoLaurate **764831, 500g**
non-ionic detergent MW: 524.6 CMC: 0.4mM TS

Sulfobetaine 8, Biotechnology Grade **N14140, 5g**
MW: 279.45 TS
Sulfobetaine 10, Biotechnology Grade **N14150, 10g**
MW: 307.48 TS
Sulfobetaine 12, Biotechnology Grade **N14160, 10g**
(>99%) MW: 335.55 TS

TRITON X-100, Reagent Grade **53578B, 1L** **53578C, 4L**
t-octylphenoxypolyethoxyethanol; CAS: 9002-93-1; MW: 646.8 TS
Reagent Grade
Color (APHA) <=100
Peroxides(P/F) NONE
pH (5%, Water) @25C: 6.0-8.0
TRITON X-100, Proteomics grade **521128, 1L** **521129, 4L**
Proteomics grade (peroxide and protease free) MW: 646.8 TS
TRITON X-100, Oxidant free **UP521121, 10ml amps of 10% solution**
See the oxidant free grade detergents section

TRITON X-114, Reagent Grade **158521, 500ml** **15852F, 1L** **15852G, 4L**
CAS: 9036-19-5 MW: 536.0 TS
TRITON X-114, Proteomics Grade **15852B, 1L** **15852C, 4L**
Same specifications as 158721 but DNase, RNase & Protease free
TRITON X-114, Oxidant free **UP158528, 10ml amps of 10% solution**
See the oxidant free grade detergents section

Tetradecyl Trimethyl Ammonium Bromide : see **TTAB (25917L)**
TTAB **25917L, 100g** **25917K, 500g**

Tetradecyl Trimethyl Ammonium Bromide); CAS: 1119-97-7; MW: 336.40 TS
High Purity Grade (>99%)

TWEEN 20, Reagent Grade **158749, 500ml** **15874A, 1L** **15874B, 4L**
Polyoxyethylene-20-Sorbitan Monolaurate TS

Arsenic(%) <=0.0003
Heavy Metals(%) <=0.001
Hydroxyl Number 96-108
Moisture (KF)(%) <=3.0
Residue on Ignition(%) <=0.25

TWEEN 20, Proteomics Grade **15874K, 1L** **15874L, 4L**
Same specifications as 15874A but DNase, RNase & Protease free

TWEEN 20, Oxidant free **UP158740, 10ml amps of 10% solution**
See the oxidant free grade detergents section

TWEEN 40, Reagent Grade **WZ5980, 500ml**
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TWEEN 80, Reagent Grade **WZ7880, 500ml** **15878F, 1L** **05878G, 4L**
Polyoxyethylene-20-Sorbitan Monooleate TS

HLB Number 15.0
Heavy Metals(%) <=0.001
Hydroxyl Number 65-80
Moisture (KF)(%) <=3.0
Residue on Ignition(%) <=0.25

TWEEN 80, Proteomics grade **15878A, 100ml** **15878B, 1L** **15878C, 4L**
Same specifications as 15878F but DNase, RNase & Protease free TS

TWEEN 80, Oxidant free **UP158780, 10ml amps of 10% solution**
See the oxidant free grade detergents section TS

Urea, UltraPure **UP031903, 500g** **UP031904,1kg**
CAS: 57-13-6 MW: 60.06 Technical Sheet
Suits Molecular Biology applications

Purity (HPLC) > 99,5%
DNase, RNase, Proteases : non detected
OD 280 (8M in water) : < 0.15
Heavy metals content : < 0.001%
Solubility in water (20°C) : > 20%
Conductivity (solution 10%) : < 40 mS

■ Detergents sampler kits

Why buy and store numerous detergents is you need to test one time or screen popular series? Try our sampler kits:

MASTER(58) **T77790**
contains 1 g each of 58 detergents, including following sampler kits

CYMAL(1-4) **819750**
contains 1 g each of CYMAL®-1,2,3,4

CYMAL(4-7) **819751**
contains 1 g each of CYMAL®-4,5,6,7,

C-HEGA(8-11) **T77870**
contains 1 g each of C-HEGA®-8.9.10.11,

HEGA(8-11) **T77880**
contains 1 g each of HEGA®-8.9.10.11

MEGA(8-10) **T77850**
contains 1 g each of MEGA-8.9.10

MALTOSIDES(6-11) **T77810**
contains 1 g each of C8.C8.C9,C10,C11

MALTOSIDES(12-16) **T77811**
contains 1 g each of C12, C13, C14, C16-β-D-maltosides

GLUCOSIDES(6-12) **T77820**
contains 1 g each of C6-C7,C8,C9,C10,C12-β-D-glucoside

THIOGLUCOP(7-10) **T77830**
contains 1 g each of C7,C8,C9,C10-β-D-thioglucoside

THIOMALTOP(8-11) **T77840**
contains 1 g each of C8,C9,C10,C11,C12-β-D-thiomaltoside

MISC(4) **463685**
contains 1 g each of CHAPS, CHAPSO, -Octyl-b-D-galactoside, Dodecyl Dimethyl Amine Oxide

IONIC(5) **T77800**
n-Decyl-N-N-dimethylgycine, n-Dodecyl-N,N-dimethylglycine, Sodium cholate, Sodium Decanoyl Sarcosine, Sodium Dodecanoyl Sarcosine

PHOSCHOL(8-12) **T77862**
contains 1 g each of C8,C9,C10,C12-phosphocholine

PHOSCHOL(13-16) **T77861**
contains 1 g each of C13,C14,C15,C16-phosphocholine

POP(7) **463686**
contains 1 g each of N-Dodecylphosphocholine, CHAPS, n-Octyl-β-D-glucoside, n-Dodecyl-β-D-maltoside, n-Decyl-β-D-maltoside, C-HEGA®-10, CYMAL®-5

See detailled information in the technical sheet, or below for more information on several of these detergents families.
See also detergent kits:

Peroxide free non-ionic detergent sampler kit **GS4260, 4x10ml at 10%***
*Contains of Tween20, Triton X100, Triton X114 and Brij35, proteomics grade and less 1µeq peroxides 10% solution, 10ml each in sealed glass ampoules under argon. Technical Sheet

JBS Solution Detergent Test Kit **FR0620, 27x4ml**
allows to screen a wide range of detergents (for non-ionic to ionic and zwitterionic) to find suitable ones and optimize concentration for protein solubilisation without interfering with its structure or function. Tak in account the critical micellar concentration (CMC).Technical Sheet

Detergent Kit Starter (10 miscellaneous detergents)
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■ Oxidant free detergents

Technical tip – Do you want reliable results ? Choose Uptima oxidant free detergents !
A lot of polyoxyethylenic detergents are available in a variety of structures and under trade names, like famous Brij®, Tween® and Triton®. Most are industrial products containing a mixture of related structures. When the manufacturing is of bad quality, the composition varies with batches and several contaminants impair biological activity of biomolecules like enzymes, labile tertiary structures and receptors…
Furthermore, polyoxyethylenic detergents tend to alter, mostly by oxidation, and this aging process is increased by light and temperature. Oxidation generates peroxides, carboxyls and free radicals that may reach up to 0.2%.
Even at far lower concentration, these oxidizing agents may be very critical in your application : such contaminants are often responsible for inactivation, denaturation, fragmentation of the desired biomolecule (Jaeger 1994), especially during the extraction from cell lysates. Sulfhydryls are readily oxidized by peroxides that induce receptors aggregation (Chang 1974) or transition of conformation state (O'Brien 1975). Contaminants may also interfere in biochemical analysis (i.e. for estrogen - Lever 1977), or even protein with Coomassie (Stuzenbberg 1992).

Polyoxyethylenes and carbohydrates derivatives detergents are provided oxidant-free, suiting ideally for protein extraction and formulation of rare or sensitive proteins. Peroxide equivalents content is below 20µM and often 5µM. They are supplied under inert gas, as convenient 10% solution vials.

Main Applications : Protein extraction (Triton X-100, Triton X-114)
Sample preparation - Solubilization
Chromatography - Buffers
Immunoassays - surfactant (Tween 20)
IgM stabilization, vaccine ingredient, emulsifier (Tween 20)

Brij-35, Oxidant Free, 10% solution 23 Lauryl ether ; C12E23; CAS: 9002-92-0	**UP091870 5 x 10 ml**	**UP091871 10 x 10 ml**	Technical Sheet
Brij-56, Oxidant Free, 10% solution 10 Cethyl ether	**UP314736 5 x 10 ml**	**UP314737 10 x 10 ml**	TS
Brij-58, Oxidant Free, 10% solution 20 Cethyl ether	**UP314740 5 x 10 ml**	**UP314741 10 x 10 ml**	TS
Triton X-100, Oxidant Free, 10% solution Octyl phenoxy poly ethoxy phenol; CAS: 9002-93-1	**UP521121 5 x 10 ml**	**UP521122 10 x 10 ml**	Technical Sheet
Triton X-114, Oxidant Free, 10% solution CAS: 9036-19-5	**UP158528 5 x 10 ml**	**UP158529 10 x 10 ml**	TS
Triton X-305, Oxidant Free, 10% solution	**UP708534 5 x 10 ml**	**UP708535 10 x 10 ml**	TS
Triton X-405, Oxidant Free, 10% solution	**UP158536 5 x 10 ml**	**UP158537 10 x 10 ml**	TS
Tween 20, Oxidant Free, 10% solution Polyoxyethylene sorbitan ; C12-sorbitan-E20	**UP158740 5 x 10 ml**	**UP158741 10 x 10 ml**	Technical Sheet
Tween 80, Oxidant Free, 10% solution Polyoxyethylene sorbitan ; C18:1-sorbitan-E20	**UP158780 5 x 10 ml**	**UP158781 10 x 10 ml**	Technical Sheet

■ Carbohydrate derived detergents

Carbohydrate based detergents are mild solubilizing, dissociation agents that overcome often polyoxyethylenic detergents for extraction, purification, and crystallization of membrane proteins and enzymes. The aging of these detergents also generates oxidative compounds, so we propose compounds which purity is highly controlled to that point.
n-Decyl-b-D-maltoside and Hecameg has been popularized to be useful for difficult membrane proteins purification. See also formulated Extraction reagents optimized for different sample materials, pages x, i.e. for cells and tissues #BZ2171.

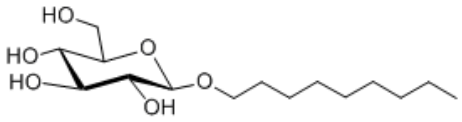
● Détergents sélectionnés

n-Octyl-β-D-glucopyranoside, UltraPure CAS: 29836-26-8 ; MW: 292.4	263701, 1 g	263702, 5 g	Technical Sheet
n-Nonyl-β-D-glucopyranoside, UltraPure CAS: 69984-73-2 ; MW: 306.4	602071, 1 g	602072, 5 g	TS
n-Decyl-β-D-glucopyranoside, UltraPure CAS: 58846-77-8 ; MW: 320.44	759091, 1 g	759092, 5 g	TS
n-Dodecyl-β-D-glucopyranoside , UltraPure CAS: 59122-55-3 ; MW: 348.5	WZ6291 1g	WZ6292, 5g	
n-Octyl-β-D-thioglucopyranoside, UltraPure CAS: 85618-21-9 ; MW : 308.4	602080, 1 g	UP602081, 5 g	
n-Decyl-β-D-maltopyranoside, UltraPure CAS: 82494-09-5; MW: 482.6	426131, 1 g	426132, 5 g	TS
n-Undecyl-β-D-maltopyranoside, UltraPure CAS: 253678-67-0 ; MW: 496.6	552051, 1 g	552052, 5 g	TS
n-Dodecyl-β-D-maltopyranoside, UltraPure CAS: 69227-93-6 ; MW: 510.6	346751, 1 g	346752, 5 g	TS
Hecameg 6-O-(N-heptylcarbamoyl)-methyl-β-D-glucopyranoside, MW: 335.4 - CAS: 115457-83-5 - Non ionic	UP785480 5 g		Technical Sheet

Exemple de spécifications	Technical sheet

n-Nonyl-β-D-glucopyranoside, UltraPure

602070



CAS: 69984-73-2; MW: 306.4

CMC(in H2O, @0.20%): ~ 6.5 mM	CMC(in 0.15M NaCl): ~ 6 mM, (in 1M NaCl): ~ 3.5mM
Aggregation:	~ 133
dn/dc:	0.1504 mL/g
Purity:	≥ 99% β+α
Percent Anomer:	< 2% α
Percent Alcohol:	< 0.005 Nonanol
pH(1% solution in water):	5-8
Solubility:	≥ 20% (in water at 0-5°C)
Conductance:	< 40 µS (10% solution in water)
Fluorescence:	<10% (0.1% solution in water at 345nm)
Absorbance of a 1% solution in water :	225 nm: < 0.1, 260 nm: < 0.06, 280 nm: < 0.04, 340 nm: < 0.02

Other carbohydrate-based detergents are available in sampler kits T77790. See description in the following technical tip, and the detergetns kits of detergents in the section 'Crystallography' (Kits DS05, DS06, JBScreen DK-101)

Technical tip - Carbohydrate detergent family – Structure and properties

Maltopyranoside Detergents

These detergents are based on Maltose derived by an alkyl tail.
Structure: Maltopyranoside-O-$(CH_2)_n$-CH_3 (n=6to16)
These detergents are milder and more effective than homologous glucopyranosides. The solubility is also increased for the higher members (even hexadecyl-maltopyranoside is soluble).

Galactopyranoside Detergents

These detergents are based on Galactose derived by an alkyl tail:
Structure: Galactopyranoside-O-$(CH_2)_n$-CH_3

Glucopyranoside Detergents

These detergents are based on Glucose derived by an alkyl tail:
Structure: Glucopyranoside-O-$(CH_2)_n$-CH_3 (n=6to12)
High CMC values (0.25M for hexadecyl-GP) and low solubility for high members limit their applications, the intermediate decyl-GP being the most useful.

MEGA Detergents

These detergents are glucose derivatives with an amide linkage between the alkyl tail and the glycoside head group.
Structure: CH_3-$(CH_2)_n$-CO-N(CH_3)-Glucose (n=6.7.8)
MEGA detergents have been used in numerous studies . They are low priced, but their solubility is rather low (HEGA detergent improve the solubility).

HEGA Detergents

These detergents are homologous to MEGA serie, but with an hydroxyl addition to increase the solubility.
Structure: CH_3-$(CH_2)_n$-CO-N(CH_2)OH-Glucose (n=6.7.8.9)

CYMAL Detergents

This serie of detergents was developed specifically for the extraction, purification, and crystallisation of membrane proteins, supported by NIH.
Structure: Ose-O-ose-O-(CH2)n-C6H11
The CMC is rather higher than linear detergents, the cyclohexyl ring packing more hydrophobibity in a shorter length. CYMAL detergent are thought better for stabilizing proteins during crystallization.

Available in our sampler kits T77790, as well as individual detergents. Please inquire at interbiotech@interchim.com.

■ Non detergent SulfoBetaines (NDSB)

NDSB are non-denaturing solubilization agents (but not considered detergents sensu stricto) that have found new applications in protein biochemistry and proteomics research:

- Crystallization formulations of proteins, peptides and nucleic acids
- extraction, solubilization

NDSBs are zwitterionic, containing a hydrophilic sulfobetaine group and a short hydrophobic group. They possess a good solubility in water, typically greater than 2M, and do not alter significantly the pH or viscosity of biological buffers. They can easily be removed by dialysis since they do not form micelles. This confer unique properties: they can:

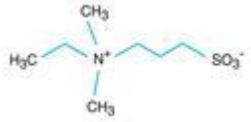
- increase greatly the solubility (i.e. solubilize lysozyme) 6
- increase the yields of membrane, nuclear, and cytoskeletal-associated proteins
- prevent non-specific interactions of proteins.
- prevent aggregation, or not disrupt strongly aggregated proteins
- substituted for sodium chloride (i.e. for isolation of halophilic proteins)
- be useful additives for crystal growth 7, increasing its size or even allowing new crystal forms 6

Literature: See Technical Sheet

1. Goldberg, M.E., et al. 1995. Folding & Design 1, 21.
2. Vuillard, L., et al. 1995. Anal. Biochem. 230, 290.
3. Vuillard, L., et al. 1995. Biochem. J. 305, 337.
4. Vuillard, L., et al. 1994. FEBS Lett. 353, 294.
6. J.Cryst Growth (1996) vol 168 pp 150-154
7. Anal. Biochem. (1995) 230, 290

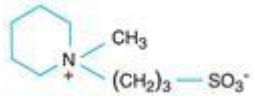
NDSB-195	**CA7461, 5g**	**CA7662, 10g**	
Dimethylethylammonium-1-propanesulfonate	MW: 195.3.		
NDSB-201	**BX3721, 5g**	**BX3723, 100g**	
3-(1-Pyridino)-1-propane sulfonate, CAS:[15471-17-7]	MW: 201.2		
NDSB-211	**DT9820, 1g**	**DT9821, 5g**	**DT9822, 10g**
Dimethyl-2(-Hydroxyethyl)-(3-Sulfopropyl)-ammonium, Inner Salt	MW: 211.28		
NDSB-221	**BN7891, 5g**	**BN7982, 10g**	
3-(1-Methylpiperidinium)-1-propane Sulfonate	MW: 221.3		
NDSB-256	**BN4051, 5g**	**BN4052, 10g**	
Dimethylbenzylammonium propane sulfonate	MW: 257.4		

NDSB-195:

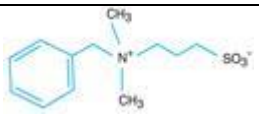


NDSB-201:

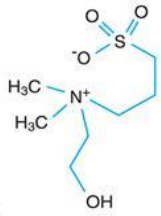
NBD221:



NDSB-256:



NDSB-211:

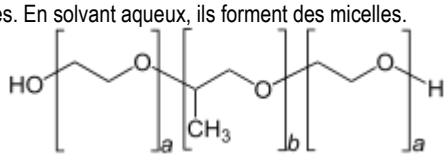


See the section 'Crystallography' or ask for NDSB-based preformulated crystallisation reagents

■ Pluronic Surfactants

Pluronic est une marque commericale de BASF Corporation.
Les surfactans Pluronic sont des polymers à blocs basés sur le poly(ethylene glycol), ou poloxamer. Amphiphiliques, ils ont un comportement similaire à d'autres surfactants hydrocarbonés. En solvant aqueux, ils forment des micelles.

Structure générale des surfactant Pluoronic :



Les poloxamers sont utilisés pour solubiliser les composés, accroitre la miscibilité de 2 substances ayant des hydrophobicités différentes, et dans les milieu de culture cellulaire ou ils réduisent les stress mécanique dans les bioréacteurs. En particulier, le Pluoric F-127 est souvent utile pour la preparation et l'incubation de sondes fluorescents incubées sur des cellules.

Pluronic F-127	**755952**	**100 g**
Pluronic F-127 10% Solution in water, 0.2µm filtered	**FP-379952**	**100 ml**
Pluronic F-127 *20% Solution In DMSO*	**FP-69806B**	**10 ml**
Pluronic F-127 *LOW UV Absorbance* CE	**FP-373619**	**1 g**
Pluronic F-68	**QH0971**	**100 g**
Pluronic F-68	**FP-098665**	**500 g**

■ Acid Labile Surfactants (AALS)

fully mass spec compatible and alleviate the problems commonly associated with the used of detergents in proteomics studies.

Progenta™ Acid Labile Surfactants are a new family of "smart surfactants" – novel, acid cleavable detergents that can be used in biological sample preparation, and then once their work is completed, the Progenta surfactants can be quickly and efficiently degraded by acidifying the sample solution. They provide a safe alternative to detergents (e.g. SDS and CHAPS) that are commonly used in proteomics work, but that negatively impact subsequent analysis by mass spectrometry. While SDS, CHAPS and other traditionally used detergents can improve protein solubility, they can be very difficult to remove during sample prep and purification of the protein sample. These bound detergents can cause significant impairment of protein analysis by mass spectrometry, as the surfactants can suppress analyte ion signal, promote analyte adduct formation, and present as contaminants during the analysis.

At neutral pH, the Progenta surfactants **function as powerful detergents** for use in sample preparation, protein solubilization, gel electroelution and cell lysis protocols. Buter after completing the experimental work, the solution is adjusted to a pH of 2.0 to 2.5 for 10 to 30 minutes to fully cleave the surfactants into small organic molecules that **do not exhibit surfactant activity or interfere with analysis by mass spectrometry (after acid treatment)**.

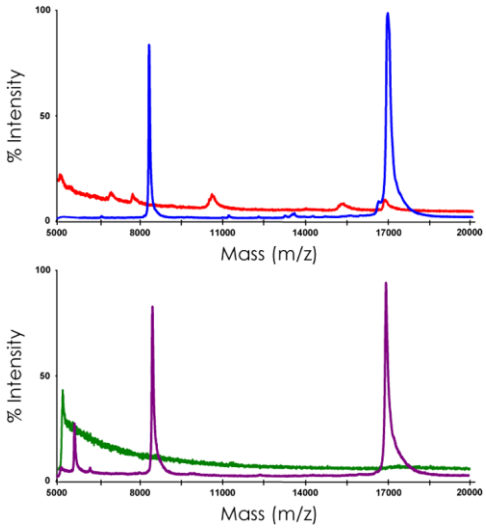
Both Progenta Anionic and Zwitterionic Acid Labile Surfactants are effective at solubilizing peptides and proteins, functioning in cell lysis protocols, optimizing enzymatic digestions, and reducing surface adsorption losses via non-specific interactions. Progenta Anionic Acid Labile Surfactants (AALS) have been engineered to replace SDS in experimental methods, and they can be additionally used in gel electroelution and anionic displacement studies. Progenta Zwitterionic Acid Labile Surfactants (ZALS) have been designed to replace CHAPS in sample preparation protocols, and they can be additionally used in the isoelectric focusing (IEF) step of 2D gel separations.

Surfactant	Critical Micellular Concentration (CMC)	Recommended concentrations for usage
AALS I:	CMC = 7.7 mM	0.01 - 2.0%
AALS II:	CMC = 1.9 mM	0.01 - 2.0%
ZALS I:	CMC=3.4mM	0.01 – 0.1%
ZALS II:	CMC=31.3mM	0.01 – 0.1%

Figure: Excellent recovery and MS analysis of protein using AALS

The nice spectra of control pure myoglobin (blue) is affected dramatically using 0.1% SDS (red) as well as with 0.1% AALS (green) but an excellent signal is fully restored by acid treatment of AALS sample (purple: myoglobin with 0.1% AALS treated by acid for 10min).

Mass spectra of 20 pmol myoglobin samples that were C4 spotted onto a MALDI plate pre-spotted with CHCA MALDI matrix.



Progenta™ Anionic Acid Labile Surfactant I (AALS I)	**DZ6731, 5mg**	**DZ6732, 5x5mg**	**DZ6733, 10x5mg**
Progenta™ Anionic Acid Labile Surfactant II (AALS II)	**DZ6741, 5mg**	**DZ6742, 5x5mg**	**DZ6743, 10x5mg**
Progenta™ Zwitterionic Acid Labile Surfactant I (ZALS I)	**DZ6751, 5mg**	**DZ6752, 5x5mg**	**DZ6753, 10x5mg**
Progenta™ Zwitterionic Acid Labile Surfactant II (ZALS II)	**DZ6761, 5mg**	**DZ6762, 5x5mg**	**DZ6763, 10x5mg**

■ other solubilization reagents

See also the kits of detergents in the section 'Crystallographie' (Kits DS05, DS06, JBScreen DK-101)

Detergents removing

The presence of detergents in biological samples may be undesired for downstream applications.

Detergents can be removed by several methods:
• **Dialysis**: this method is economic but long and of limited efficiency for several detergents. See section 'Dialysis' [PW]
• **Gelfiltration**: the method is quick but suffers of same limitations as dialysis. See section 'Ultrafiltration/Gelfiltration' [PW].
• **Binding**: detergents can be very efficiently removed using ProteoCon products. See section 'Biochemistry purification'.

In particular, the SDS imparts a negative charge to the tightly-bound SDS-protein complex, inhibits enzymatic activity during digestion, and both suppresses ion signals and presents as a contaminant in mass spectrometry analyses.

■ Detergent Removal by precipitation

See the Protein Preparation Reagent.

■ Detergent Removal by affinity

● Detergent Removal Kit

SDS Removal SDS-Out Precipitation Kit (with Microspin Tubes) **548960-20308, 1 Kit**
Removes 90M of SDS at 0.1-1% in samples from 0. To 10ml. The kit process up 200ml sample. It contains the SDS-precipitating reagent (10ml), 12 spin-columns and tubes.

● Detergent Removal Spin Columns

These microcentrifuge columns include a resin that efficiently binds to and removes (>90-95%) high concentrations of detergents (1-5%) from 10 µL to 1 mL samples with minimal sample and protein loss. Best for processing samples with proteins or peptides at greater than 100 µg/mL

Detergent Removal Spin Columns, 125µL **FV7810-87776, 25u**
Contains 25 columns, for 10-25µLsamples
Detergent Removal Spin Columns, 0.5mL **FV7820-87777, 25u**
Contains 25 columns, for25-100µLsamples
Detergent Removal Spin Columns, 2mL **FV7830-87778, 5u**
Contains 5 columns, for150-500µLsamples
Detergent Removal Spin Columns, 4mL **FV7840-87779, 5u**
Contains 5 columns, for500-1000µLsamples
Detergent Removal Spin Column Kit **IUE800-88304, 2 plates**
96-well filter plates contain 0.55 mL of resin slurry per well
Detergent Removal Resin **FV7800-87780, 10mL**

●HiPPR™ Detergent Removal

Improves mass spectrometry results by efficiently removing detergents from samples with low protein or peptide concentrations in less than 15min.

HiPPR Detergent Removal Spin Column Kit **IUE810-88305, 5 mL Kit**
Contains 5ml of resin and 54 spin-columns (sufficient for up to 54 samples of 25-200 µL each)
HiPPR™ Detergent Removal Spin Columns, 0.1 mL **IUE820-88306, 24 columns**
Contains 0.1ml resin per column.
HiPPR™ Detergent Removal 96-well Spin Plates, 0.1 mL **IUE830-88307, 2 plates**
Contains 0.1ml resin per well. For 25 to 200 µL samples.

Biorelevant dissolution testing

■ SIF powder for dissolution testing - FaSSIF/FeSSIF/FaSSGF methods

SIF media can be used **to investigate the release characteristics of drugs and drug products in the stomach and small intestine, particularly in terms of food effects**.

- Make three different media (FaSSIF, FeSSIF and FaSSGF) from one powder
- Contains biological surfactants (sodium taurocholate, lecithin)

Dissolution testing allows to get a clearer understanding of how much drug will go into solution before passing into the small intestine (FaSSGF), how much drug is likely to be absorbed in vivo (FaSSIF), to test the food effects on the dissolution of a drug in fed small intestine (FeSSGF), and how much is likely to be absorbed in vivo (FeSSIF).

SIF Powder (Original) for FaSSIF/FeSSIF/FaSSG		**1A7101, 2.5L**	See detailed presentation here (BB010s)
FaSSIF/FeSSIF/FaSSGF **BUFFER for FaSSGF**		**B49IP0-FASBUF01, 6 L**	
Simulated fluid : stomach / prandial state: Fasted	pH :1.6		
FaSSIF/FeSSIF/FaSSGF **BUFFER for FaSSIF**		**B49IO0-FASBUF01, 6 L**	
Simulated fluid : small intestine / prandial state: Fasted	pH :6.5		
FaSSIF/FeSSIF/FaSSGF **BUFFER for FeSSIF**		**B49IQ0-FESBUF01, 3 L**	
Simulated fluid : small intestine / prandial state: Fed	pH :5.0		

Dog FaSSIF/Dog FaSSGF
Dog FaSSIF/FaSSGF is an artificial powder containing phospholipid and taurocholate in an HDPE bottle, to simulate fasted state canine gastrointestinal fluids.

Proteases inhibitors & other additives

Technical tip – Proteolysis challenges in biochemistry
Proteases are ubiquitous enzymes in every cell of all organisms. They are released by cells during disruption of cells, and quickly degrade any protein. When one wants to recover or detect a given protein, protease inhibition is thus required and even critical to save the yield and the quality of the protein. **Protease inhibitors** are also useful to protect bioactive proteins during further analysis (western blotting, immunoprecipitation, bioassays, reporter analysis…), purifications steps (chromatography, dialysis), and storage.
Other additives are combined to protease inhibitors, such as Phosphatase Inhibitor to avoid the loss of phosphorylation level of proteins, and **antibiotics** to prevent bacterial growth.

Interchim provides high quality protease inhibitors to suit these challenges for the requirements of biochemistry, molecular Biology, and proteomics. For antibiotics, see the cell culture' section page xx.

Selection guide - Proteases inhibitors

Different types of proteases exist. Serine proteases are present in almost all cells, dominating with cysteine proteases in plants, or with metalloproteases in bacteria, or with both in animal tissues. Occasionally, aspartic proteases can interfere too in animal tissus isolations notably when a low pH is required. The table below indicates most important general inhibitors dedicated to these proteases types, and inhibiting notably commonly found non-specific proteases, as well formulated solutions that are described further.

Proteases	♦ General Inhibitors and ► specific Inhibitors
Serine proteases	► AEBSF is a superior serine protease inhibitor ► See also Aprotinin ♦ See also Leupeptin, PMSF ♦ See also Protease inhibitor cocktail, General use #374723 page x.
• chymotrypsin	
• trypsin	
• kallikrein	
• plasmin	
• thrombin	
• Subtilisin	
Cysteine proteases	► antipain and E64 ♦ See also Leupeptin, PMFS, Protease inhibitor cocktail, for plant lysates #CF8610 page x.
• papain	
• calpain	
• cathepsin B, H, L, S	
Metalloproteases	► Phosphoramidon, Bestatin, EDTA ♦ See also Protease inhibitor cocktail, for bacterial lysates #CF8610 page x.
• Ca+ metalloproteases	
• MetalloEndoProteinases	
Aspartic acid proteases	► Pepstatin
• Pepsin	
• Renin	
• Cathepsin D	
Others, specific proteases	► Refer to individual descriptions below

Verify protease inhibition: see Protease Assays BK962A-13500
Need purified enzymes? Search our database online or ask at interbiotech@interchim.com.

■ Featured Protease Inhibitors

AEBSF

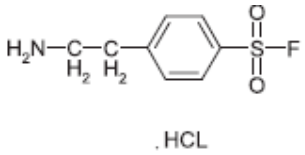
Non toxic and more potent serine protease inhibitor, more soluble and stable, than PMSF and DFP.

AEBSF **UP401070, 100 mg** **UP401071, 1g** **UP401071, 5x1g**
MW: 239.7; CAS: [30827-99-7]. Technical Sheet

This protease inhibitor is very useful to protect proteins in biochemistry and proteomics analysis, as well as in cell biology applications: it is superior at several point to others inhibitors for following reasons :

	PMSF	DSP	AEBSF
Solubility (in water)	0.12 (a)	15.4	200
Stability	Low (b)	Mediocrous	Excellent
Inhibitor activity : Trypsin/chymotrypsin Plasmatic enzymes	- Good Good or less	- Excellent Good or less	- Good Excellent
Toxicity (relative)	300	14	1

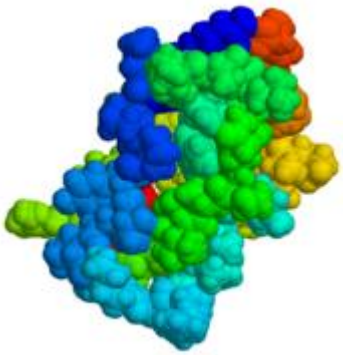
(a) Decreases at high ionic strength - (b) Need frequent additions



Aprotinin

A potent serine protease inhibitor, freely soluble in water

This protease inhibitor is useful in cell biology applications to prevent protein degradation during lysis or homogenization of cells and tissues, then to protect proteins in biochemistry and proteomics analysis: it inhibits competitively and reversibly serine proteases (chymotrypsin, trypsin, kallikrein, plasmin). It is also useful in study of antifibrinolytic and pancreatic enzymes. Does not inhibit Factor Xa or thrombin. Working range is 0.06 - 2.0 µg/ml (0.01 - 0.3 µM).



Aprotinin **UP185582, 10mg**
UP185583, 50mg
MW: 6511.5; CAS [9087-70-1] (bovine pancreatic trypsin inhibitor, BPTI). Technical Sheet

■ Formulated Protease Inhibitors Solutions - Cocktails

Following solutions are mixtures of selected protease inhibitors that are critical for the preservation of protein integrity during purification and analysis procedures in samples of a broad range of organisms. Specific cocktails formulations are available for mammalian, bacterial or plant lysates. These cocktails target a range of different proteases including serine, cysteine, aspartic and metalloproteases as well as aminopeptidases. Supplied as lyophilized powder, each vial can be reconstituted to form a concentrate solution.

Protease Inhibitors Uptima

. Ready-to-Use Protease Inhibitors Cocktails to safeguards samples against protease activities.

Uptima provides ready-to-use formulated cocktails of inhibitors for use in protein research.

▪ **Convenient**: No need to prepare, ready-to-use formulations.
▪ **Consistent**: High quality ensures reproducible results.
▪ **Easy-to-use**: Simply dilute according to your needs.
▪ **Flexibility**: EDTA-Free, Animal-Free and DMSO-Free (cocktail is a lyophilized solid instead of a solution in DMSO). ▪ **Optimized formulations** designed for your specific applications.
▪ **Wide Range**: A great selection of specific cocktail formulations designed to inhibit proteolytic activity from most tissues or cell extracts, including mammalian, bacterial, yeast, fungal and plant cells.

The four more popular Inhibitor cocktails are:
-Protease Inhibitor **Cocktail III** is a specially formulated cocktail of six protease inhibitors with broad specificity for the inhibition of aspartic, cysteine and serine proteases as well as aminopeptidases.
-Protease Inhibitor **Cocktail IV** specially formulated cocktail of four protease inhibitors with broad specificity for the inhibition of serine, cysteine, aspartic and metallo-proteases.
-**Bestatin** is an aminopeptidase inhibitor.
-**Leupeptin** a reversible inhibitor of serine and cysteine proteases. Often used for the inhibition of plasmin, trypsin, papain, kallikrein and cathepsin B.

Inhibitor	Recommended Applications	Cocktails Components	Specificity of Inhibitors	Cat No. (Storage code)
Proteases	Inhibitors	Technical sheet		
Protease Inhibitor Cocktail I (general use)	General Use	AEBSF, Aprotinin, E-64, EDTA, Leupeptin	Proteases, Esterases, Cysteine Proteases, Metalloproteases and Trypsin-like Proteases	WT0900, 1 vial
Protease Inhibitor Cocktail I (gen.animal-free)	General use and for applications that require animal-free reagents	Animal-Free AEBSF, Aprotinin (Recombinant) E-64, EDTA, Leupeptin	Serine Proteases, Esterases, Cysteine Proteases, Metalloproteases and Trypsin-like Proteases	WT0940, 1 vial
Protease Inhibitor Cocktail II (bacterial)	Bacterial cell extracts	AEBSF, Bestatin, E-64, EDTA, Pepstatin A	Proteases, Aminopeptidases, Cysteine Proteases, Metalloproteases and Aspartic Proteases	WT8260, 1 vial
Protease Inhibitor Cocktail III (mammalian)	Mammalian cells and tissue extracts	AEBSF, Aprotinin, Bestatin, E-64, Leupeptin, Pepstatin A	Serine Proteases, Cysteine Proteases, Trypsin-like Proteases, Aspartic Proteases, Aminopeptidases	WT0850, 1ml
Protease Inhibitor Cocktail III (mam.animal-fre)	Mammalian cells and tissue extracts and for applications that require animal-free reagents	Animal-Free AEBSF, Aprotinin (Recombinant), Bestatin, E-64, Leupeptin, Pepstatin A	Serine Proteases, Cysteine Proteases, Trypsin-like Proteases, Aspartic Proteases, Aminopeptidases	WT0920, 1ml
Protease Inhibitor Cocktail III (man.solvent free)	Mammalian cells and tissue extracts, for animal-free, organic solvent free applications	Animal-Free, DMSO-Free AEBSF, Aprotinin (Recombinant) Bestatin, E-64, Leupeptin, Pepstatin A	Serine Proteases, Cysteine Proteases, Trypsin-like Proteases, Aspartic Proteases, Aminopeptidases	WT0890, 1 vial
Protease Inhibitor Cocktail IV (fungi & yeast)	Fungal and yeast cell extracts	AEBSF, E-64, Pepstatin A, Phenanthroline	Serine Proteases, Cysteine Proteases, Aspartic Proteases and Metalloproteases	WT0930, 1ml
Protease Inhibitor Cocktail V, Mam. EDTA-Free	Mammalian cells and tissue extracts, samples analyzed by 2-D gel electrophoresis	AEBSF, Aprotinin, E-64, Leupeptin	Proteases, Cysteine Proteases and Trypsin like Proteases	WT8280, 1 vial
Protease Inhibitor Cocktail V, EDTA-Free	Mammalian cells and tissue extracts and for applications that require animal-free reagents	Animal-Free AEBSF, Aprotinin (Recombinant), E-64, Leupeptin	Proteases and Trypsin like Proteases	WT0860, 1 vial
Protease Inhibitor Cocktail VI, General Use	General Use	AEBSF, Aprotinin, Bestatin, E-64, EDTA, Leupeptin=	Proteases, Trypsin like Proteases, Aminopeptidases and Metalloproteases	WT8220, 1 vial
Protease Inhibitor Cocktail VI, Plant Cells	Plant cell extracts	AEBSF, Bestatin, E-64, Leupeptin, Phenanthroline, Pepstatin A =	Proteases, Aminopeptidases, Cysteine Proteases, Aspartic Proteases and Metalloproteases	WT0870, 1 vial
Protease Inhibitor Cocktail VII	Histidine-tagged proteins	AEBSF, Bestatin, E-64, Pepstatin A, Phosphoramidon	Serine Proteases, Cysteine Proteases, Aspartic Proteases, Aminopeptidases, Metalloendopeptidases	WT0880, 1ml
Protease Inhibitor Cocktail VII, DMSO-Free	Histidine-tagged proteins and for organic solvent free applications	AEBSF, Bestatin, E-64, Pepstatin A, Phosphoramidon	Serine Proteases, Cysteine Proteases, Aspartic Proteases, Aminopeptidases, Metalloendopeptidases	WT0910, 1 vial
Protease Inhibitor Cocktail VIII	Broad range cysteine protease inhibition	ALLN, Antipain, E-64 =	=Calpain I/II, Cathepsin A/B, Cathepsin L/S, Papain, and Cysteine Proteases	DZ0280, 1ml
Serine Protease Inhibitor Cocktail I	Broad range serine proteases inhibition	AEBSF, Aprotinin, Elastatinal, GGACK	Broad range serine protease inhibition. Chymotrypsin, Kallikrein, Plasmin, Thrombin, Trypsin, Elastase, Urokinase and Factor Xa	WT8230, 1 vial

*: Store at -20C°. Reconstitute each vial with 1 ml H2O to obtain a 1 ml 100X stock solution.

●Also available:

protease inhibitor cocktail, General Use **374723, 1 ml 100X**
Each vial of lyophilized powder can be reconstituted in 1 ml deionized water to form a 100X solution. Technical sheet

protease inhibitor cocktail, with EDTA **374724, 1 ml 100X**
Each vial of lyophilized powder can be reconstituted in 1 ml deionized water to form a 100X solution. Technical sheet

protease inhibitor cocktail, for mammalian lysates **AN0990, 1 ml 100X**
Each vial of lyophilized powder can be reconstituted in 1 ml deionized water to form a 100X solution. Technical sheet

protease inhibitor cocktail, for bacterial lysates **CF8600, 5 ml 20X**
Each vial of lyophilized powder can be reconstituted with 1ml DMSO and 4 ml water to form a 20X solution. Technical sheet

protease inhibitor cocktail, for plant lysates **CF8610, 1 ml 100X**
Each vial of lyophilized powder can be reconstituted in 1 ml deionized water to form a 100X solution. Technical sheet

Composition of cocktail (Concentrations for 1X)		General #374723	General+EDTA #374724	Mammalian #AN0990	Bacterial #CF8600	Plant #CF8610
Protease Inhibitor Name	MW					
AEBSF	239.5	+	+	+	+	+
Aprotinin	6512.0	+	+	+		
Bestatin	308.4	+	+	+	+	+
E-64	357.4	+	+	+	+	+
Leupeptin	493.6	+	+	+		+
EDTA*	372.2		+		+	
Pepstatin	685.9			+	+	+
1,10-Phenanthroline	198.2					+

*1 ml of solution is sufficient to inhibit 20 ml of lysate from 4 g (wet weight) of E. coli cells.

■ Protease Inhibitors

Protease inhibitor powders.

Inhibitor name (CAS#)	Cat. # , Qty	M.W	Commentaire (spécificité d'inhibition, utilisation)
Ac-Asp-Glu-Val-H (aldehyde)	UP827070, 5 mg	502.5	Inhibits apopain/CPP32/Yama. TS
Ac-Tyr-Val-Ala-Asp-H (aldehyde)	UP827080, 5 mg	492.5	Inhibits ICE and related enzymes. TS
Ac-Tyr-Val-Lys-Asp-H (aldeh.)	UP827090, 5 mg	549.6	Inhibits ICE and related enzymes. TS
AEBSF (4-(2-aminoethyl)benzeneSulfonyl Fluoride, CAS:30827-99-7)	UP401070, 100 mg UP401071, 1 g	239.7	Inhibits irreversibly serine proteases. More soluble and stable than PMSF and DFP. See description page. Technical sheet
Antipain HCl (CAS:37691-11-5)	UP257317, 5 mg	677.6	Inhibits reversibly cysteine and serine proteases (trypsin, papain, cathepsin A and B). Working range is 1-100 µM (50 µg/ml = 74 µM). TS
Aprotinin (CAS:9087-70-1)	UP185582, 10 mg UP185586, 50 mg	651.2	Inhibits competitively and reversibly serine proteases (chymotrypsin, trypsin, kallikrein, plasmin). Does not inhibit Factor Xa or thrombin. Working range is 0.06 - 2.0 µg/ml (0.01 - 0.3 µM). Technical sheet
Benzamidin (CAS: 206752-35-5)	003051, 25 g	156.6	Inhibits competitively trypsin-like serine proteinases including trypsin (Ki=18 µM), thrombin, plasmin. Suggested final concentration : 1 mM. TS
Bestatin (CAS: 58970-76-6)	UP300991, 10 mg	308.4	Inhibits competitively aminopeptidases, especially aminopeptidase B, leucine aminopeptidase and tripeptide aminopeptidase, but not carboxypeptidases. Working range is 1-40 µM. Soluble in Methanol. TS
CA-074	UP827130, 5 mg	384.4	Inhibits cathepsin B D. Inubushi et al., 1994, Biochem. Biophys., 116,282. TS
CA-074 Me (CAS: 147859-80-1)	UP827180, 5 mg	397.5	Inhibits intracellular cathepsin B D. Buttle et al., 1992, Arch. Biochem. Biophys., 299:377. TS
Chymostatin (CAS: 9076-44-2)	UP29706B, 5 mg	605	Inhibits α-,ß-,γ-,d-Chymotrypsin, and also many other cysteine proteases (papain). TS
E-64 (CAS: 66701-25-2)	UP789581, 5 mg	357.4	Inhibits irreversibly cysteine proteases (papain, calpain, cathepsin B,H,L,S). Working range is 6 - 60 µg/ml (10 - 100 µM). Technical sheet
E-64-c (CAS: 76684-89-4)	UP827140, 5 mg	314.38	Inhibits thiol proteases (Cathepsin B/H/L, Calpain) Technical sheet
E-64-d (CAS	UP827190, 5 mg	342.44	Membrane permeable analog of E.64c. Technical sheet
EDTA (CAS: 6381-92-6)	036290, 1 kg 036292, 100 g	372.2	Inhibits reversibly metalloproteases by chelating metal ions cofactors. Workingrange is 1-10 µM Disodium salt. Technical sheet
EGTA (CAS: 6381-92-6)	UP10075A, 10 g	380.4	Inhibits reversibly metalloproteases by chelating calcium ions cofactors. Technical sheet
Elafin (Human)	UP831970, 20 µg	5.9KDa	Inhibits elastase from human skin (K_i=0.17nM) and human proteinase 3 (K_i=0.42nM). TS
Leupeptin (CAS:103476-89-7)	UP827721, 5 mg UP827724, 25 mg	463	Inhibits reversibly cysteine and serine proteases (trypsin, plasmin, papain,kallikrein, thrombin, cathepsin A,B). Working range is 1-100 µM. TS
1,10-phenanthroline (CAS:5144-89-8)	N12740, 10 g N12741, 50 g	198.2	Reversible inhibitor of metallo-proteinases by chelation of divalent cations (i.e. Fe^{2+}) (Ki=6.3 µM ACE, Ki= 40 µM thermolysin, Ki=50 µM astacin). Soluble in methanol, ethanol or DMSO (200 mM). Working range: 1-10 mM. TS
Pepstatin (CAS: 26305-03-3)	UP827752, 25 mg	685.9	Inhibits aspartic acid proteases (pepsin, renin, cathepsin D) and also HIV protease. Useful range is 0.7 µg/ml (1 µM). Soluble in DMSO, Methanol. TS
Phosphoramidon (CAS:3657-77-4)	348112, 25 mg	543.5	Inhibits collagenase, thermolysin and metalloendoproteinases. Working range is 4 - 330 µg/ml (7 -570 µM). TS
PefaBloc (CAS:30827-99-7)			See AEBSF item UP401070 (Pefabloc SC) in featured products, and other Pefabloc inhibitors below for hematology.
PMSF (Phenyl Methyl Sulfonyl Fluoride) (CAS: 329-98-6)	147376, 5 g 147374, 25 g	174.2	PMFS inhibits irreversibly serine proteases (trypsin, chymotrypsin, kallikrein, subtilisin, thrombin) and also cysteine protease papain. Soluble in Ethanol, Methanol. Working range is 17 - 170 µg/ml (0.1-1 mM). Technical sheet
Trypsin Inhibitor, from Soybean, immobilized. (CAS: 9035-81-8)	UP158624, 1 mg	12.5KDa	Inhibits trypsin and trypsin-like proteases (chymotrypsin and elastase). Technical sheet
Z-Asp-CH2-DCB Z-Asp-2,6-Dichlorobenzoyloxymethyl Ketone (CAS: 153088-73-4)	UP831910, 5 mg	454.27	Inactivates the interleukin-1β-converting enzyme, and blocks apoptosis by non-selectively inhibiting caspases activity. Cell permeable. Working range: 1-100 µM. TS
Z-Ile-Glu(OBut)-Ala-Leu-H (aldehyde) [PSI] (CAS: 158442-41-2)	UP831920, 5 mg	618.7	Inhibits proteasomes. TS
Z-Leu-Leu-H (aldehyde) (CAS: -)	UP831930, 5 mg	362.5	Inhibits calpains. Working range is > 10 µm. TS
Z-Leu-Leu-Leu-H (aldehyde) [M132] (CAS : 133407-82-6)	UP831940, 5 mg	475.63	Inhibits proteasomes (calpain). Soluble in DMSO, Ethanol, Methanol and DMF. poorly soluble in water or in aqueous buffers. TS
Z-Leu-Leu-Nva-H (aldehyde) [M6115] (CAS:133407-86-0)	UP831960, 5 mg	461.61	Inhibits proteasomes. TS

Qualified protease inhibitors:
Following protease inhibitors are tested as **protease free**. See description of each inhibitor above.

AEBSF	**GS4072, 50 mg**			TS
Antipain dihydrochloride	**25731C, 5 mg**			TS
Aprotinin	**18558D, 10 mg**	**18558[E], 50 mg**		TS
Benzamidine hydrochloride	**003059, 25 g**	**00305B, 50 g**	**00305A, 100 g**	TS
Bestatin	**300995, 10 mg**			TS
Chymostatin	**29706D, 5 mg**			TS
E-64	**GS4080, 5 mg**			TS
EDTA-Na2	**T32141, 500 g**	**T32142, 1 Kg**	**T32143, 2,5 Kg**	TS
Leupeptin	**827728, 5 mg**	**827729, 25 mg**		TS
Pepstatin	**827754, 5 mg**	**827755, 25 mg**		TS
1,10-phenathroline	**GS3880, 10 g**	**GS3881, 50 g**		TS
PMSF	**GS3920, 5 g**	**GS3921, 25 g**		TS
Phosphoramidon	**348118, 5 mg**			TS
Trypsin inhibitor, soybean	**N15152, 1 g**	**N15153, 10 g**		TS

See also protease inhibitors dedicated for Hematology. see section 'Hematology'

Phosphatase Inhibitor Cocktails

Cocktails that safeguards samples against serine, threonine and protein tyrosine phosphatase activities.

The inactivation of phosphatases is useful to prevent their uncontrolled activity upon cell lysis, especially for the study phosphorylation activation states of proteins. For this purpose, Uptima provides great Phosphatase Inhibitor Cocktail.

Phosphatase Inhibitor Cocktails preserve phosphorylation of proteins in cells and tissues and protein extracts during a variety of preparation or analytical procedures. Cocktails are provided at concentration designed to be used typically diluted 100X (reconstitute each vial with 1 ml H_2O to obtain a 1 ml stock solution.). The cocktails II is the most popular.

Phosphatase Inhibitor	Recommended Applications	Cocktails Components	Specificity of Inhibitors	Cat No. (Storage code)
Cocktail I	Animal tissues, A431 or Jurkat cell extracts	Bromotetramisole, Cantharidin, Microcystin LR	Alkaline Phosphatases, Protein Phosphatase 1 and 2A (PP-1 and PP-2A)	WT0960, 1ml (J)
Cocktail II	Animal tissues, A431 or Jurkat cell extracts	Imidazole, Na(Orthovanadate, Fluoride, Tartrate, Molybdate)	Protein Tyrosine Phosphatase, Acid Phosphatases and Alkaline Phosphatases	WT8270, 1vial (J)
Cocktail III	Animal tissue extracts	Na(Orthovanadate, Fluoride, Pyrophosphate), Glycerophosphate	Ser/Thr Phosphatases, Acid Phosphatases, Alkaline Phosphatases, PP1 and PP2A	BT325A, 1vial (M) ex WT8240
Cocktail IV	Animal tissue extracts	Bromotetramisole, Cantharidin, Calyculin A	Alkaline Phosphatases, PP1 and PP2A	WT0960, 1ml (J)

Technical sheet

+

Extraction/fractionation solutions - formulated chemicals

Extraction of Cellular proteins – Minute™ Kits

Minute™ protein extraction kits are unlike any other protein extraction kits in the market, these next generation protein extraction kits employ **buffer system optimized** for each living material, coupled with state of the art proprietary **filter cartridge technologies (spin column)** for protein extraction and fractionation. They offer simple, rapid, consistent, high-yield results that save you time and money.

Minute Extraction Kit	Order Number	Part number	Size	
● fro animal samples				
Total Protein Extraction Kit	**1J1540**	**SD-001/SN-002**	**50preps**	**[S]**
Detergent-Free Protein Extraction Kit	**1K6180**	**SN-006**	**50 preps**	**[S]**
> cellular fractions				
Cytoplasmic & Nuclear Extraction Kit	**1J1580**	**SC-003**	**50 preps**	**[S]**
Plasma Membrane Protein Isolation Kit	**1J0670**	**SM-005**	**50 preps**	**[S]**
Single Cell Isolation Kit	**1J1770**	**SC-012**	**50 preps**	**[S]**
Single Cell Isolation Kit	**1J1771**	**SC-012**	**100 preps**	
Histone/DNA Binding Protein Extraction Kit	**1K6210**	**HP-014**	**50 preps**	**[S]**
Mitochondria Isolation Kit, for Mammalian Cells & Tissues	**1J5130**	**MP-007**	**50 preps**	**[S]**
Nuclear Envelope Protein Extraction Kit	**1K6200**	**NE-013**	**50 preps**	**[S]**
> particular materials				
Total Protein Extraction Kit for Adipose Tissues/Cultured Adipocytes	**1K6160**	**AT-022**	**20 preps**	
Adipose Tissue Fractionation Kit	**1K6170**	**AF-023**	**20 preps**	
Protein Extraction Kit for Hair and Nails	**1K6150**	**HD-021**	**20 preps**	
● from technological materials				
Protein/Nucleic Acid Extraction Kit from Gels	**1K6240**	**PN-019**	**20 preps**	
● from bacteria, yeast				
Bacterial Total Protein Extraction Kit	**1J1560**	**SB-004**	**50preps**	**[S]**
Total Protein Extraction Kit for Microbes with Thick Cell Walls	**1J1570**	**YT-015**	**50 preps**	
Detergent-Free Protein Extraction Kit for Microbes with Thick Cell Walls	**1K6220**	**YD-016**	**50 preps**	**[S]**
Yeast Mitochondria Enrichment Kit	**1J5140**	**YM-017**	**50 preps**	
● from plants				
Total Protein Extraction Kit for Plant Tissues	**1J1550**	**SD-008/SN-009**	**50 preps**	**[S]**
Detergent-Free Plant Protein Extraction Kit	**1K6190**	**SN-010**	**50 preps**	**[S]**
Chloroplast Isolation Kit	**1I8780**	**CP-011**	**50 preps**	**[S]**
Plant Microsomal Membrane Extraction Kit	**1K6230**	**MM-018**	**50 preps**	

[S] : Sample available.

Featured kit descriptions

All the kits are composed of optimized extraction buffers and protein extraction filter cartridges with 2.0 ml collection tubes (for 50preps).
Due to the use of the protein extraction filter cartridges, extraction and separation of protein fractions can be easily and quickly accomplished in (typically less than 15 minutes).

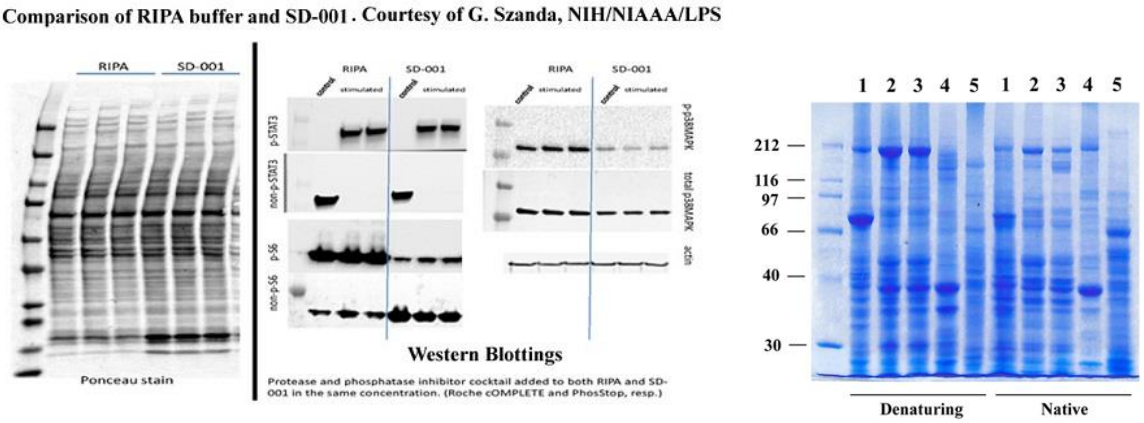
- Extraction of proteins from Mammalian Cells
- Extraction of proteins from cellular fractions
- Extraction of proteins from microorganisms
- Extraction of proteins from plants (vegetals)
- Extraction of proteins from gels

■ Extraction of proteins from Mammalian Cells

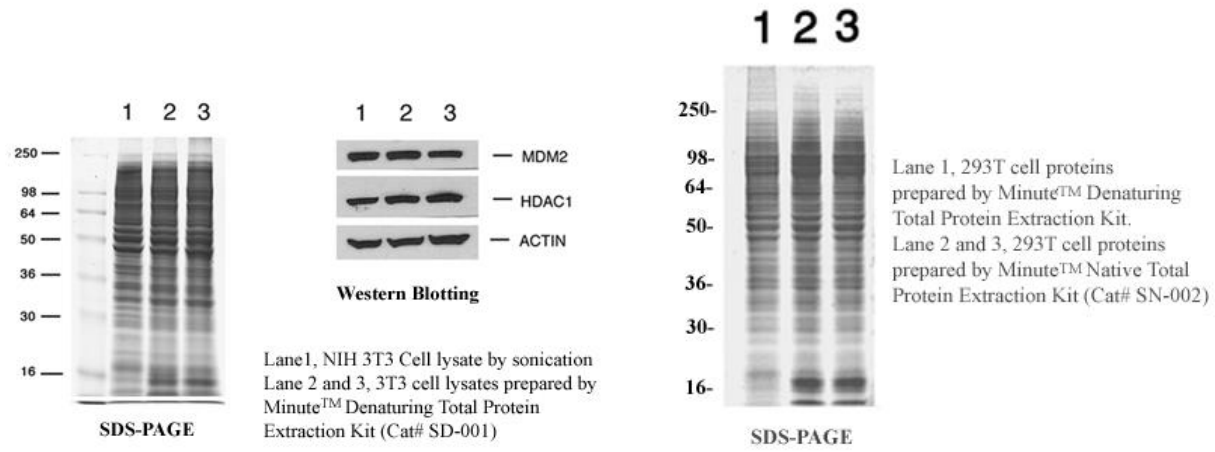
- **Total Protein Extraction Kits**

Total Protein Extraction Kit SD-001/SN-002, 50preps

The kit is designed to rapidly extract total proteins from animal cells and tissues (invertebrate and vertebrate) for protein analysis and further purification. Since protein profiles extracted by denaturing and native cell lysis buffer are not identical, for a given application one might be superior to the other. This kit provides both denaturing and native cell lysis buffers for users to test and select the best one for a specific application. Due to the use of the protein extraction filter cartridges, the extraction volume can be as small as 20 µl and as large as 500 ul. This unique feature is very useful in situations where available starting material is a limiting factor. Total proteins can be extracted from cultured cells/tissues in 1-8 min with high yield (2-8 mg/ml). Extracted proteins can be use as a good starting material for protein analysis and small scale protein purification in column chromatography.



Protein profiles of animal tissues extracted by denaturing lysis buffer and native lysis buffer. Extracted proteins were separated in 10% SDS-PAGE and stained with coomassie blue. Lane 1, drosophila larvae; lane 2, drosophila pupa; 3, adult drosophila; 4, gold fish muscle and 5, mouse liver



Kit contains :

Denaturing Cell Lysis Buffer	25 ml	SD-001-L
Native cell lysis buffer	25 ml	SN-002-L
Protein Extraction Filter Cartridges	50	P-001
Collection Tubes with Cap	50	P-002
plastic rods	4	P-003

Minute™ Detergent-Free Protein Extraction Kit SN-006, 50 preps

The kit is designed to rapidly extract detergent-free total proteins from cultured cells (insect /mammalian/other cultured cells) and animal tissues (invertebrate and vertebrate). The protein extraction buffers do not contain any detergent and EDTA. Due to the use of the protein extraction filter cartridges, the extraction volume can be as small as 20 µl and as large as 500 µl. This unique feature is very useful in situations where available starting material is a limiting factor. Detergent-free total proteins can be extracted from cultured cells/tissues in less than 5 min with high yield (1-5 mg/ml).

Single Cell Isolation Kit SC-012, 50 preps

The kit is designed to rapidly isolate single cells/nuclei from fresh/frozen/formaldehyde fixed animal tissues. The tissue disaggregation buffers are formulated to gently disaggregate animal tissues. The buffers don't contain any proteinases that may have an advert effect on cell surface marker detection. Due to the use of filter cartridges with pre-defined pore size and thickness, single cell suspension can be isolated from fresh or fixed tissues quickly with high yield and viability. Single cells isolated with the kit can be used for chromosome immunoprecipitation (ChIP) and FACS analysis. The single cell suspension can also be used as a starting material for isolation/purification of DNA, RNA, proteins and other cellular components.

Minute™ Protein Extraction Kit for Hair and Nails HD-021, 20 preps

Proteins account for about 80% of keratinized animal tissues that include but not limited to hair, nail, horn and wool. These tissues contain mainly hard Î±-keratins made of several distinctive types of protein with molecular weight ranging from 10-135 Kda. Majority of the proteins are ranging from 10-65 Kda. Several methods have been reported for protein extraction from keratinized animal tissues. The extraction buffer usually contains high concentration of urea, thiourea, guanidine hydrochloride or a combination of these strong denaturants. Protein extraction with high concentration denaturants is relatively effective but the concentration of extracted protein is usually low due to larger extraction buffer/tissue ratio. Extracted proteins need to be concentrated prior to further analysis. The presence of high concentration of denaturants may also interfere with downstream application.

This kit is designed to effectively extract proteins from keratinized animal tissues without using strong denaturants mentioned above. The extracted protein can be directly loaded onto SDS-PAGE without concentration. The extraction buffer of this kit contains 0.5% SDS and other chemicals. Extracted protein concentration is 1-2 mg/ml.

Minute™ Total Protein Extraction Kit for Adipose Tissues/Cultured Adipocytes AT-022, 20 preps

Adipose tissue especially white adipose tissue (WAT) has been recognized as an important endocrine and inflammation organ in addition to its energy storage function.
Isolation and analysis of proteins from adipose tissues are increasingly critical for understanding many physiological/pathological conditions.
However isolation and analysis of WAT and brown adipose tissue (BAT) are technically very challenging due to their high lipid and low protein contents.

This kit use a novel technology to deal with the challange of extracting proteins from Adipose tissues and lipid-rich materials. A porous filter with unique surface property and pre-defined pore size and thickness coupling with a specially formulated detergent-free extraction buffer is employed to rapidly and effective separate water-oil emulsion derived from adipose tissue homogenate. The extraction buffer has lower freezing point than that of oil in adipose tissues and the aqueous phase can be quickly separated from oil phase by passing the tissue homogenate through the filter. The total proteins isolated are un-biased representation of cellular proteins in the tissue. The extracted proteins concentration is very high (2-3 mg/ml) as compared to other methods.

Minute™ Adipose Tissue Fractionation Kit AF-023, 20 preps

In average, total cellular proteins account for less than 2% of adipose tissues. Fractionation of adipose tissue is technically very challenging due to its high lipid and low protein contents.
Fractionation and analysis of proteins from adipose tissues are critical for understanding many physiological/pathological conditions. The water-oil emulsion present in biological sample is notoriously difficult to separate.

This kit use the saml technology as kit AT-022 with a specially formulated detergent-free extraction buffer to fractionate adipose tissue into two fractions: water-soluble protein fraction containing mainly cytosolic proteins and water insoluble fraction containing mainly plasma membrane, and organelles such as mitochondria. The buffers used in this kit are free of primary amine, detergent and reducing agents. Isolated proteins are compatible with all downstream applications including TMT labeling, enzyme digestion, MS analysis and other applications.

■ Extraction of proteins from cellular fractions

● Extraction/Isolation of Cell fractions proteins from animals

Minute™ Cytoplasmic & Nuclear Extraction Kit SC-003, 50 preps

The kit is designed to rapidly separate native cytosol and nuclear proteins from cultured mammalian cells or tissues. Separation in less than 15 minutes.

Minute™ Plasma Membrane Protein Isolation Kit 50 preps

This is a true native (detergent and EDTA free) plasma membrane (PM) proteins isolation kit coupled with unique mechanisms of action using patented technologies. Cells/Tissues are sensitized before passing through a filter that allows cells to travel in a convoluted path. The cell membranes are ruptured during the process without using traditional homogenization or sonication. PM are separated from a mixture of residual un-ruptured cells, nuclei, cytosolic proteins and organelles by subsequent differential and density centrifugations using a desk top micro-centrifuge. Ultracentrifugation is not required. By eliminating unwanted variations caused by manual homogenization or sonication, this kit enables researchers to obtain consistent results in less than 45 minutes.

Minute™ Mitochondria Isolation Kit For Mammalian Cells And Tissues MP-007, 50 preps

The kit is designed to rapidly isolate native mitochondria proteins from cultured mammalian cells or tissues. Due to the use of protein extraction filter cartridges, the protein isolation procedure is simple, easy and user friendly with high yield. Unlike many commercial mitochondria preparation kits, this kit offers wide range of starting cells (5-50 million/sample) and intact mitochondria are isolated. The buffers are detergent and EDTA free. A Dounce homogenizer or a tissue blender is not needed. The procedure can be completed in less than 30 min.

Minute™ Nuclear Envelope Protein Extraction Kit NE-013, 50 preps

The nuclear envelope is a very complex membrane-protein system that is notoriously difficult to isolate and purify due to its connection to nuclear and cytoplasmic components. Traditional method of nuclear envelope isolation and purification requires a large amount of starting material and a lengthy and tedious procedure. Only our extraction kit rapidly isolate nuclear envelope and its associated proteins in native form without using density-gradient and ultra centrifugation, simple, easy and user friendly. The nuclear envelope proteins are significantly enriched in the final prep. This kit starts with only 10-20 million cells and the buffers are detergent and EDTA free. The procedure can be completed in less than 45 min with a final yield of 10-50 µg protein/sample.

Minute™ Histone/DNA Binding Protein Extraction Kit HP-014, 50 preps

Histones and other DNA binding proteins play an important role in chromosome organization, gene regulation and posttranslational modification. Core components of histones can be covalently modified through methylation, acetylation, phosphorylation, and sumoylation. These modifications are essential for gene expression, regulation, DNA repair and chromosome condensation. HP-014 is designed to rapidly extract histones and other DNA binding proteins from cultured cells and cells isolated from animal tissues.

Unlike many other commercial histone extraction kits that employ acid or high salt extraction methods, this kit extracts histone proteins through a completely different mechanism. This kit is equally efficient in extracting histones and other DNA binding proteins that can be used for internal controls for histone modification analysis. In comparison acid extraction protocol selectively extracts basic proteins and a good internal

control is usually not possible. The kit can extract histones from 0.5 to 5 million cells in less than 10 min with high protein yield (1-2.5 mg/ml) making it the fastest and most robust histone extraction kit available in the market.

■ Extraction of proteins from microorganisms

● Extraction/Isolation of Cell fractions proteins from microorganisms (bacteria, yeast)

Minute™ Bacterial Total Protein Extraction Kit SB-004, 50preps
The kit is designed to rapidly extract denatured proteins from bacteria. The kit contains sufficient materials for extraction of total proteins from 100 ml E.coli culture.

Minute™ Total Protein Extraction Kit for Microbes with Thick Cell Walls YT-015, 50 preps

Protein extraction from cell wall-containing microbes is a frequent procedure in bio-research Labs. The methods for protein extraction from these microbes are usually harsh, tedious and not sufficiently reliable.

This kit provides an instrument-free, rapid and gentle way for extracting proteins from microbes with thick and strong cell walls. These microbes include but not limited to yeast, filamentous fungus, gram positive and negative bacteria, insect eggs and microalgae. This kit contains optimized denaturing and native protein extraction buffers for user to choose from. Unlike many other methods of which harsh conditions, such as 8 M urea, glass bead lysis using an instrument, and boiling the sample with alkaline extraction etc., are used for yeast protein extraction. Proteins in certain molecular weight range are usually preferentially extracted with these methods. This kit features a single tube protocol, full range of yeast proteins are extracted without bias. The kit works well for both log phase and stationary phase microbes. The whole procedure takes less than 10 min to complete and the protein yield is in the range of 2-5 mg/ml.

Minute™ Detergent-Free Protein Extraction Kit for Microbes with Thick Cell Walls YD-016, 50 preps
This kit provides a detergent-free, rapid and gentle way for extracting proteins from microbes with thick and strong cell walls. These microbes include but not limited to yeast, filamentous fungus, gram positive and negative bacteria, insect eggs and microalgae. This kit contains optimized detergent-free and EDTA-free protein extraction buffers. The whole procedure takes less than 10 min to complete and the protein yield is in the range of 2-4 mg/ml with un-biased protein representation. This kit features a single tube protocol and works well for both log phase and stationary phase microbes.

Minute™ Yeast Mitochondria Enrichment Kit YM-017, 50 preps

Traditional protocols for yeast mitochondria isolation/extraction involve a range of centrifugation-based subcellular fractionation procedures. Typically the techniques include spheroplast preparation, glass-bead lysis using a homogenization instrument, differential centrifugation and several density gradient procedures using a variety of gradient media with ultracentrifugation. The procedures are very tedious and time consuming.

This kit features a simple and rapid protocol for yeast mitochondria enrichment, yet gentle and instrument-free. Nativ mitochondrial proteins can be isolated from yeast in about one hour without ultracentrifugation. This kit contains optimized detergent-free protein extraction buffers. The protein yield is in the range of 150-250 µg/sample. .

■ Extraction of proteins from plants (vegetals)

● Extraction/Isolation of Cell fractions proteins from plants, Yeast

Minute™ Total Protein Extraction Kit for Plant Tissues SD-008/SN-009, 50 preps
The kit is designed to rapidly extract denatured or native proteins from plant tissues (leaves, seeds and soft stem and roots etc.). Since protein profiles extracted by denaturing and native cell lysis buffer are not identical, for a given application one might be superior to the other. This kit provides both denaturing and native cell lysis buffers for users to test and select the best one for a specific application. total plant soluble proteins can be extracted from 20-200 mg plant tissue in less than 8 min with high protein yield (2-8 mg/ml). Extracted proteins can be use as a good starting material for protein analysis and small scale protein purification in column chromatography.

Minute™ Detergent-Free Plant Protein Extraction Kit SN-010, 50 preps
The kit is designed to rapidly extract detergent-free total proteins from plant tissues. The protein extraction buffer does not contain any detergent and organic solvent. Due to the use of the protein extraction filter cartridges, the extraction volume can be as small as 50 µl and as large as 500 µl. Detergent-free total proteins can be extracted from very small plant samples (leaves, seeds, soft stems etc.) in less than 8 min with high yield (1-6 mg/ml).

Minute™ Chloroplast Isolation Kit CP-011, 50 preps
The kit is designed to rapidly extract intact chloroplasts from fresh plant tissues (leaves, seeds and soft stems etc.). Unlike many other methods that require 1-10+ gram tissues for chloroplast isolation, this kit can quickly obtain 1 X 10^6 to 1 X 10^7 intact chloroplasts (>90% intact) from 5-200 mg fresh plant leaves in less than 5 min.

Plant Microsomal Membrane Extraction Kit MM-018, 50 preps

Isolation of microsomal membranes from plant tissues is a common laboratory procedure. Microsomal fraction is believed to be enriched for plasma membranes, endoplasmic reticulum, Golgi apparatus, vacuolar membranes and other components of membrane system. Traditional method for microsomal fraction isolation involves so called differential pelleting protocol where a series of centrifugation steps are required to obtain various membrane fractions, requiring so large amount of starting material and employing tedious ultracentrifugation steps.

This kit offers a simple, rapid and user friendly approach for microsomal membrane extraction using small amount of starting material (200 mg). Water soluble cytosolic proteins are removed during the procedures and water insoluble microsomal fraction, especially plasma membrane fraction, is extracted with optimized buffers in a table-top microcentrfuge. The procedure is simple, rapid and no special instrument required.

Native microsomal proteins can be isolated from plant tissue in about one hour without ultracentrifugation. The protein yield is in the range of 100-200 µg/sample.

■ Extraction of proteins from gels

● Extraction of proteins from Gels

Minute™ Protein/Nucleic Acid Extraction Kit from Gels **PN-019, 20 preps**

Passive elution and electro elution are the most common methods for extracting proteins and/or nucleic acid from polyacrylamide/agarose gels. Protein extraction by passive elution usually takes overnight incubation. Eluted proteins are significantly diluted and require further concentration. Protein extraction by electro elution is faster (30 min to 2 h) than passive elution but it requires a special elution device that works less effectively for larger proteins (>70 Kda). The electro buffer usually contains detergent and other chemicals at a concentration that may interfere with downstream applications.

This kit features a rapid and instrument-free protein/nucleic acid extraction kit. Proteins/nucleic acid can be extracted from gels in <10 min with high yield. The elution buffer can be a detergent-containing buffer or pure water depending upon methods of gel staining. The elution volume is between 10 to 200 µl. Multiple gel pieces can be processed in a single tube and the final protein concentration is relatively high.

~~**Minute™ PCR Template Prep** **PC-020, 100 preps**~~

~~The PCR template Prep kit is designed to extract genomic DNA from animal tissues (such as mouse tail), cultured cells and blood (fresh or anti-coagulated with EDTA, citrate, or heparin) for polymerase chain reaction (PCR).~~

Other protein extraction/solubilisation kits and reagents

See others kits

BB002m Bacterial and Mammalian Cell Extraction Kits

BB002p Cell Lysis and Extraction Kits, including Acid Labile Surfactants (AALS)

See also section 'Isolation of recombinent proteins' page in chapter '**protein expression**'.

Standard Ready-to-use Extraction reagents

RIPA lysis and extraction buffer **HG4361, 100ml** **HG4362, 250ml**

A popular buffer based on Tris and NP-40, DOC, SDS and EDTA (does not contain protease or phosphatase inhibitors). Technical sheet

Protein Extraction Buffer (Cell/Tissue) **BZ2171, 100ml**

An economic and efficient extraction buffers based on mild detergents, salts and additives for cells and tissues. Technical sheet

See also **Precipitation reagents** (TCAreagent #BI2941/GebaFlex Electroelution; PPR reagent #R5594A/for Protein assays)

typical protein yield using Extraction buffer #BZ2171:

Eukaryotic cells	400µl per 5.10^6 cells	2mg protein
Tissues	600µl per 10g	8-10mg protein

PER cell lysis extractions for proteomics

M-PER II Mammalian Protein Extraction reagent **879140-78501, 250ml** **879141-78505, 1L**

Rapid lysis in 5 minutes at room temperature, compatible with downstream reporter assays, kinase assays, immunoassays and protein assays; overcomes freeze/thaw cycle and sonication procedures. TS

M-PER Mammalian Eukaryotic Membrane protein extraction reagent kit **R558220-89826, 1 kit** for the enrichment of integral membrane proteins from cultured mammalian or yeast cells or from mammalian tissue using a mild Détergent-based protocol. TS

NE-PER Nuclear & Cytoplasmic protein extraction reagent **884930-78833, 1Kit/runs** Facilitate the separation of nuclear extracts and cytoplasmic fractions from the same set of cells in less than two hours. TS

I-PER Insect Cell Protein Extraction Reagent **DU7261-89802, 250ml**

An efficient, gentle reagent that provides maximum extraction of soluble proteins from Baculovirus-infected insect cells grown in suspension or monolayer culture. TS

T-PER Tissue Protein Extraction Reagent **884950-78510, 500mL**

Proprietary Détergent in bicine-buffered saline, pH 7.6; sufficient for 25g fresh tissue.
Mild, for extraction of total protein from tissue samples; compatible with dowstream reporter assays, protein kinase assays, immunoassays and/or proteinpurifications. TS

Y-PER Yeast protein extraction reagent **821001-78990, 200ml** **821001-78991, 500ml**

Gently disrupt the tough yeast cell wall in less than 20min at room temperature; 100% more effective than glass beads lysis methods while eliminating physical problems; works with Saccharomyces cerivisiae, Schizosaccharomyces pombe, Pichia pastorisn Bacillus subtilus…. TS

Inclusion Body solubilization reagent **922830-78115, 100ml**

Used after B-PER lysis, to solubilize insoluble proteins while allowing refolding procedures; denaturing agent wan be dialysed before SDS-PAGE or other uses.

B-PER Bacterial Protein Extraction Kit **586490-78243, 165ml** **586491-90084, 250ml** **586492-8248, 500ml** **586493-78266, 500ml**

B-PER II (2x concentrate) **RK1530 036.78260, 250ml**

B-PER Bacterial Protein Extraction Kit, with enz. **RK1870-90078, 250mL kit** **RK1871-90079, 500mL kit**

Kit 250ml Contains B-PER Reagent (250mL), Lysozyme, 20mg/mL, 1.25mL, DNase I (10 000 U/mL), 1.25mL; sufficient for 60g cell paste

B-PER Direct Bacterial Protein Extraction Kit, with enz. **RK1880-90080, 50mL kit** **RK1881-90081, 250mL kit**

Kit 250ml contains B-PER Direct Reagent (250mL), Lysozyme (20mg/mL, 5mL) and DNase I (10 000 U/mL, 5mL); Sufficient for 25 x 96-well plates of cultured cells

M-PER Mammalian Eukaryotic Membrane protein extraction reagent kit **R55820-89826, 1 kit**
for the enrichment of integral membrane proteins from cultured mammalian or yeast cells or from mammalian tissue using a mild Détergent-based protocol.

M-PER Nuclear & Cytoplasmic protein extraction reagent **884930-78833, 1Kit/runs** Facilitate the separation of nuclear extracts and cytoplasmic fractions from the same set of cells in less than two hours.

Mitochondria Isolation Kit for Cultured Cells **FN1200-89874, 1 kit/50runs**
Only 40 minutes to isolate intact mitochondria with maximum yield. TS

Peroxisome Enrichment Kit for Tissue **DU7251-89840,1kit/25runs**
To fractionate soft tissues with maximum yield. TS

Inclusion Body solubilization reagent **922830-78115, 100ml**
Used after B-PER lysis, to solubilize insoluble proteins while allowing refolding procedures; denaturing agent wan be dilaysed before SDS-PAGE or other uses. TS

More on line[PW]

Extraction of exosomes: Exo-spin

Exosomes are extracellular vesicles (small EVs -30-100nm; or larger MVB) that are produced in the endosomal compartment of most eukaryotic cells. They have become emerging targets for biomedical research (blood, urine, cerebrospinal fluid, pulmonary cancer cells,…).
Exosome isolation remains challenging, fitting in 4 method types:
*Differential ultracentrifugation (UC)
*Size-Based Isolation such as size exclusion chromatography (SEC)
*Precipitation (PEG)
*Affinity-Based Capture (membrane affinity methods)

ExoSpin extraction kits and columns

- Extraction kits of exosomes from blood (Exo-spin kit #AS44U0),
- Extraction kits of exosomes from low-prtoein fluids (culture media, urine, saliva) (Exo-spin kit #AS44R0),
- Exo-spin Columns : standard (#AS44R0), Midicolumns (#AS44X0), Minicolumns (#AS44W0)

+ : cellules quie produit exosomes, contenu, methodes d'isolation: Ultracentrifugation / Size-Based Isolation / Precipitation (PEG) / Affinity-Based Capture

Accessory reagents for protein extraction: endotoxin removal,

Endotoxin testing

See Endotoxin Removal products line[BE024e]

Endotoxin removal

See Endotoxin Removal products line[BB190e]

More products

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Miscellanous - Fractionnation and Extraction

Complexe biological samples such as tissues should be often dissociated in cells suspension. See the "Cell recovery" catalog (i.e. Accutase and Accumax dissociation). Then cells can be fractionated in simplier cells populations, or clarified from cell debris (centrifiugation, filtration, cytometry cell sorting).
or from undesired compounds (precipitation) prior analysis or extraction and purification. Extraction or precipitation can also be used to remove undesired compounds or oppositly to extract compounds of interest from complexe solutions or suspensions, i.e. fatty liquids (i.e Carrez clarification solution).

After a lysis step of cells, subcellular components may also be processed for a fractionation step: See above section for kits to isolate proteins from cytoplasm, plasma or nuclear membranes, mitochondria or nucleus.
(i.e. isolation of exosomes,

■ Carrez clarification

Carrez clarification kit treat a wide variety of samples, notably food but also blood, intended to be analyzed by enzymatic or other means. The reagents cause precipitation of proteins and fats, elimination of interference due to a number of redox compounds, which can affect assays and eliminates turbidity and emulsions particularly in food testing.
Most samples collected for analyses of small molecule analytes such as carbohydrates, alcohols, aldehydes and organic acids can be prepared using this reagent system. Carrez clarification is not suitable for samples in which enzymatic activities are to be quantified, nor analytes that may be converted (ascorbate, (vitamin C), citrate, urea (> ammonia), aconitate (> citrate).

Carrez clarification kit **IDJ181., 1kit** (qsp 10tests)
Contains:Reagent I (500µl) and Reagent II (500µl); sufficient to treat 100 samples of 1-5g. Technical sheet, Price

Other available products :

Protein Preparation Reagent (PPR) **R5594A**
Selectively precipitate the proteins in 4-steps within total<10min at room temperature. Amenable down 50µl samples Technical sheet

Information inquire

Reply by Fax : +33 (0) 4 70 03 82 60 or email at interbiotech@interchim.com

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