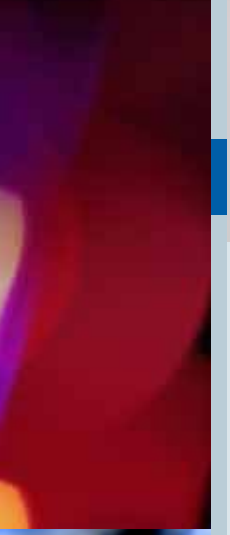
Sample Preparation

SERVA
serving scientists

Reagents and Consumables



Sample Preparation

A first important step in the successful isolation and purification of proteins is the efficient lysis of cells and tissues. **SERVA's Mammalian Protein Extraction Kits** provide a fast and easy method for the isolation of native proteins from cells and tissues.

Using ultrafiltration or highly selective affinity chromatography, proteins can be purified quickly and easily from the supernatant of cell and tissue extracts. These methods are complemented by a selection of highly specific **enzymes** as well as **„empty" columns**.

Protease and **phosphatase inhibitors** as mixes or stand-alone reagents are protecting the valuable proteins against degradation or modification.

For isolation of intact and pure nucleic acids SERVA offers highly active **enzymes** and **ready-to-use buffer solutions**, all guaranteed DNase and RNase free.

For more information about SERVA broad range of detergents and dialysis tubings, please refer to the complementary brochures **"Detergents"** and **"Dialysis Tubings"**.

Protein Sample Preparation

Protein Extraction

One of the most efficient buffers for the lysis of mammalian cells and tissues is **RIPA buffer**. Save time and labor by using SERVA's ready-to-use **RIPA Buffer** for extraction of total protein suitable for many applications like Western Blotting, protein purification and protein assays.

Product	Size	Cat. no.
RIPA Buffer	100 ml	39244.01
	500 ml	39244.02

SERVA's Mammalian Protein Extraction Kits provide a fast and easy method for the isolation of total protein or native cytoplasmic, membrane and nuclear protein fractions from cells or tissues.

- Mild but efficient lysis with high protein yield
- No need for mechanical disruption or ultracentrifugation
- Reagents are compatible with standard protein quantification assays like BCA Protein Assay
- Extracted proteins are directly applicable in downstream applications like Western blot, ELISA, EMSA

Product	Description	Size	Cat. no.
Mammalian Total Protein Extraction Kit	Total proteins in only 55 min	100 samples	39241.01
Mammalian Membrane Protein Extraction Kit	Membrane and cytoplasmic proteins in only 75 min	50 samples	39242.01
Mammalian Nuclear and Cytoplasmic Protein Extraction Kit	Nuclear and cytoplasmic proteins in only 80 min	50 samples	39243.01

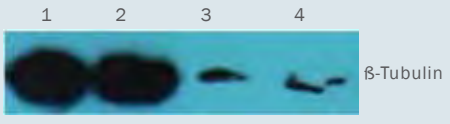


Fig. 1 Membrane proteins were isolated from HEK293 cells using the SERVA Mammalian Membrane Protein Extraction Kit and the Membrane Protein Extraction Kit of a competitor, following the respective protocols. To determine the percentage of cross contamination by cytoplasmic proteins in the membrane protein fraction, ß-Tubulin was detected in the cytoplasmic (lane 1,2) and membrane extract (lane 3,4) by Western blot.

Fig. 2 Cytoplasmic and nuclear proteins were isolated from HEK293 cells using the SERVA Mammalian Membrane Protein Extraction Kit and the Membrane Protein Extraction Kit of a competitor, following the respective protocols. To analyze the efficiency of cellular fractionation, ß-Tubulin and HDAC1 were detected in the cytoplasmic (lane 1,2) and nuclear extract (lane 3,4) by Western blot.

At SERVA we are committed to assisting you at every stage in your protein sample preparation procedures – SERVA Serving Scientists!

Affinity Chromatography

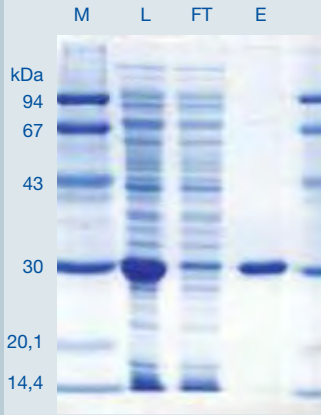
Affinity chromatography is a technique that separates tagged proteins and other biomolecules using biological interactions. This technique is widely used to obtain high purity yield accompanied by good resolution and selectivity.

A. GST-Tag Purification

Fusion proteins expressed from pGEX vectors contain a Glutathione S-Transferase (GST) moiety and can therefore be purified to near homogeneity by affinity chromatography with glutathione as a substrate.

The Glutathione Agarose Resin recovery rate is more than 95 % and the mild conditions retain the biological activity of the isolated proteins. Handling is easy and identical to standard protocols of other manufacturers, therefore there is no need to change established protocols.

Product	Binding capacity	Size	Cat. no.
Glutathione Agarose Resin	8 mg/ml	10 ml	42172.01
		100 ml	42172.02



Glutathione Agarose Resin

M = Marker
L = Lysate
FT = Flow-through
E = Eluate

Thrombin from bovine plasma is suitable for removal of the GST-tag from a recombinant fusion protein containing an accessible thrombin recognition sequence.

Product	Specific activity	Size	Cat. no.
Thrombin, from bovine plasma, lyophil.	min. 1,000 U/mg	250 U	36402.01
		1,000 U	36402.02
		5,000 U	36402.03

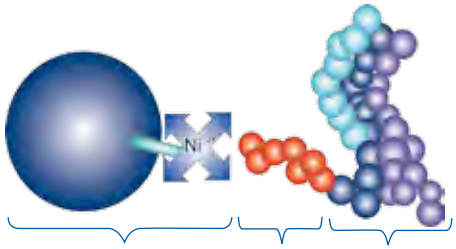
Protein Ark HiFliQ GST FPLC Columns are pre-packed and ready to use for rapid affinity purification of tagged proteins under native conditions. Compatible with all common HPLC and FPLC instruments (including ÄKTA™ FPLCs), and low pressure pumps and syringes using an appropriate adaptor.

Product	Binding capacity	Size	Cat. no.
1 ml HiFliQ GST FPLC Column	10 mg/ml	1 column	42291.01
		5 columns	42292.01
5 ml HiFliQ GST FPLC Column	10 mg/ml	1 column	42293.01
		5 columns	42294.01

B. His-Tag Purification

Recombinant proteins carrying a poly-His are easily purified by immobilized metal affinity chromatography (IMAC). This kind of purification is based on the interaction between superficial protein residues with transition metal cations bound to agarose beads, forming chelated complexes.

Principle of His-Tag purification



SERVA NTA Agarose Resin consists of crosslinked agarose derivatized with nitrilotriacetic acid (NTA) and loaded with divalent nickel or cobalt ions. The four metal-binding sites on the chelate enable high protein binding and result in minimal metal leaching, making the resin ideal for purification under reducing conditions. **SERVA Ni-NTA Magnetic Beads** allow the rapid and easy small scale purification of histidine tagged proteins.

Product	Binding capacity	Size	Cat. no.
Ni-NTA Agarose Resin	50 mg/ml	25 ml	42139.01
		100 ml	42139.02

Product	Pressure max.	Binding capacity	Size	Cat. no.
Super Ni-NTA Agarose Resin	72 psi	30 mg/ml	10 ml	42317.01
			25 ml	42318.01
			100 ml	42319.01
Super Co-NTA Agarose Resin	72 psi	30 mg/ml	10 ml	42320.01
			25 ml	42321.01
			100 ml	42322.01

Product	Binding capacity	Size	Cat. no.
Ni-NTA Magnetic Beads	75 mg/ml	2 ml	42179.01
		10 ml	42179.02
SERVAMag Rack	-	1 unit	MR-12

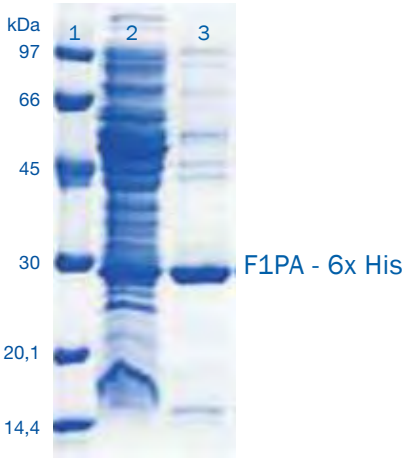
High pressure NTA agarose resin is also available as **HiFliQ pre-packed columns for HPLC/FPLC**

Product	Volume	Binding capacity	Size	Cat. no.
HiFliQ Ni-NTA FPLC Column	1 ml	50 – 75 mg/ml	1 column	42283.01
			5 columns	42284.01
	5 ml		1 column	42285.01
			5 columns	42286.01
HiFliQ Ni-NTA FPLC Column	1 ml	40 – 50 mg/ml	1 column	42287.01
			5 columns	42288.01
	5 ml		1 column	42289.01
			5 columns	42290.01

SERVA IDA Agarose Resins have iminodiacetic acid (IDA) groups covalently coupled to crosslinked agarose beads and are loaded with a divalent metal. Since IDA has three sides for interaction with metal ions instead of four for NTA, bound proteins can usually be eluted from IDA resins more easily and with lower imidazole concentrations. The cost-effective loose resin is suitable for batch and column purification.

- Ni^{2+} for higher affinity and lower specificity
- Co^{2+} for higher specificity and lower affinity

Purification of Fuculose 1-aldolase (6xHis) with SERVA Ni-IDA HD Agarose Resin



1. Low Molecular Weight Markers (LMW)
2. F1PA (6xHis) Extract
3. Eluate

Purification of Glutarylacylase (6xHis) with SERVA Co-IDA HD Agarose Resin

1. Low Molecular Weight Markers (LMW)
2. Glutaryl Acylase (6xHis) Extract
3. Eluate

Low Pressure IDA Agarose Resins

Product	Activation grade	Loading capacity Me^{2+}/ml	Size	Cat. no.
Ni-IDA HD Agarose Resin	HD	20 - 40 µmol	25 ml	42141.01
			100 ml	42141.02
Co-IDA Agarose Resin	HD	20 - 40 µmol	25 ml	42143.01
			100 ml	42143.02

Ni^{2+}-IDA-Metal Chelate Sepharose® Resin for High Pressure Chromatography

Product	Pressure max.	Binding capacity	Size	Cat. no.
Ni-IDA-Metal Chelate Agarose Resin	42 psi	10 mg/ml	25 ml	42315.01
			100 ml	42316.01

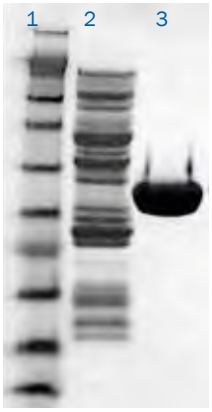
The **Ni-Extrachel Agarose Resin** has a polychelator ligand covalently coupled to a highly crosslinked agarose resin and is loaded with nickel ions. The resin works in presence of EDTA, DTT and other chemicals, which result in stripping of the metal ions with standard Ni-NTA or -IDA resins

- One-step purification without the need of pre-treatment of samples
- Higher resistance against EDTA, DTT, ethanol, etc. as resins of other vendors

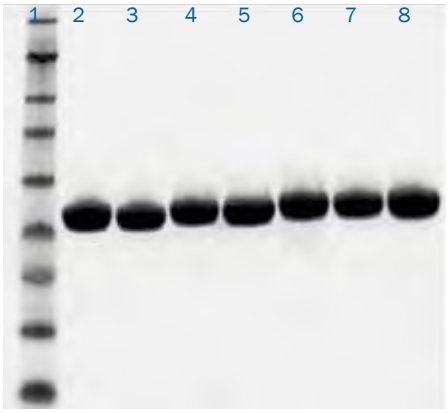
High Pressure Ni-Extrachel Agarose Resin

Product	Binding capacity	Size	Cat. no.
Ni-Extrachel Agarose Resin	> 80 mg/ml	25 ml	42180.01
		100 ml	42180.02

The Proteus Ni-IMAC kit is designed for simple, rapid His-tagged recombinant protein purification from a cell lysate under native or denaturing conditions. Proteus spin columns replace lengthy and expensive chromatographic methods such as FPLC by a rapid one-step purification.



1. Standard Markers
2. Sample Wash
3. Eluate



1. Standard Markers
2. Purified Wild Type Protein

3–8. 6x Purified Mutant Proteins

Product	Columns	Vivaspin 500 UF Concentrators	Vivaspin 20 UF Concentrators	Buffers	Size	Cat. no.
Mini Kit Mini MC Plugs	24x 0.23 ml	24	–	yes	1 kit	42269.01
Mini Pack Mini MC Plugs	24x 0.23 ml	–	–	yes	1 kit	42270.01
Mini Bulk Pack Mini MC Plugs	72x 0.23 ml	–	–	–	1 kit	42271.01
Mini Sample Kit Mini MC Plugs	4x 0.23 ml	4	–	yes	1 kit	42268.01
Mini Sample Pack Mini MC Plugs	1x 0.23 ml	–	–	–	1 kit	42267.01
Midi Kit MC Plugs	8x 1.6 ml	–	8	yes	1 kit	42272.01
Midi Pack MC Plugs	8x 1.6 ml	–	–	yes	1 kit	42273.01
Midi Bulk Pack MC Plugs	24x 1.6 ml	–	–	–	1 kit	42274.01
Buffer Pack	–	–	–	yes	1 kit	42277.01

- **Protocol for purifying under native and denaturing conditions**
- **Different kit formats according to your needs**

C. Antibody Purification (Protein A/G)

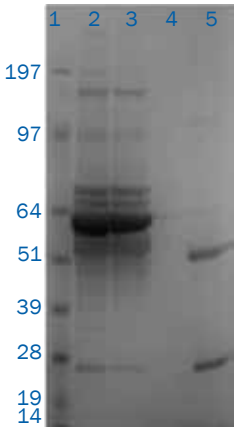
Antibody purification is a very important step in obtaining new therapeutic agents. Affinity chromatography is a vital technique in the purification of monoclonal and polyclonal antibodies based on the affinity and specificity of Protein A and Protein G for the Fc region of IgG from a variety of species.

For FPLC applications **Recombinant Protein A and Protein G Sepharose® Resins** are ideal. These resins are designed for simple, one-step and rapid antibody purification from serum, ascites and tissue culture supernatant derived from static cultures and bioreactors.

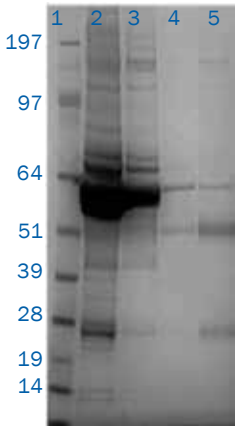
The purified antibody samples can be used in a wide range of laboratory procedures such as 1D or 2D polyacrylamide gel electrophoresis, Western blotting, ELISA etc.

Product	Pressure max.	Binding capacity	Size	Cat. no.
Recombinant Protein A Sepharose® FF Resin	120 – 140 psi	30 mg/ml	1 ml	42309.01
			5 ml	42310.01
			25 ml	42311.01
Recombinant Protein G Sepharose® FF Resin	120 – 140 psi	20 mg/ml	1 ml	42312.01
			5 ml	42313.01
			25 ml	42314.01

Product	Volume	Binding capacity	Size	Cat. no.
HiFliQ Protein A FPLC Column	1 ml	30 mg/ml	1 column	42295.01
			5 columns	42296.01
	5 ml		1 column	42297.01
			5 columns	42298.01
HiFliQ Protein G FPLC Column	1 ml	20 mg/ml	1 column	42299.01
			5 columns	42300.01
	5 ml		1 column	42301.01
			5 columns	42302.01



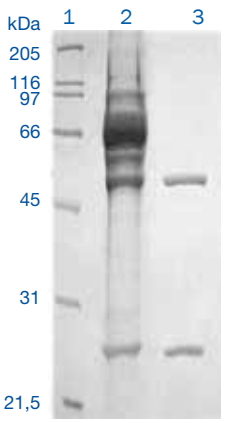
Protein A Purification
Lane 1: MW marker
Lane 1: Rabbit serum
Lane 1: Flow-through
Lane 1: Wash pool
Lane 1: Eluted IgG



Protein G Purification
Lane 1: MW marker
Lane 1: Supernatant
Lane 1: Flow-through
Lane 1: Wash pool
Lane 1: Eluted IgG_1

Choice of both Protein A & G for complete coverage of antibody subclasses and host species

The innovative **Proteus Protein A and Protein G Mini Kits** combine the quality separation you expect from gravity flow columns with the speed and ease-of-use of spin columns.



1. Standard Markers
2. Load
3. Eluate

Product	Columns	Vivaspin 500 UF Concentrators	Vivaspin 20 UF Concentrators	Buffers	Size	Cat. no.
Protein A Mini Kit Mini A Plugs	16x 0.23 ml	16	–	yes	1 kit	42256.01
Protein A Mini Bulk Pack Mini A Plugs	48x 0.23 ml	–	–	–	1 kit	42257.01
Protein A Mini Sample Kit Mini A Plugs	2x 0.23 ml	2	–	yes	1 kit	42255.01
Protein A Mini Sample Pack Mini A Plugs	1x 0.23 ml	–	–	–	1 kit	42254.01
Protein A Midi Kit Midi A Plugs	4x 1.6 ml	–	4	yes	1 kit	42258.01
Protein A Midi Bulk Pack Midi A Plugs	12x 1.6 ml	–	–	–	1 kit	42259.01
Protein G Mini Kit Mini G Plugs	16x 0.23 ml	16	–	yes	1 kit	42262.01
Protein G Mini Bulk Pack Mini G Plugs	48x 0.23 ml	–	–	–	1 kit	42263.01
Protein G Mini Sample Kit Mini G Plugs	2x 0.23 ml	2	–	yes	1 kit	42261.01
Protein G Mini Sample Pack Mini G Plugs	1x 0.23 ml	–	–	–	1 kit	42260.01
Protein G Midi Kit Midi G Plugs	4x 1.6 ml	–	4	yes	1 kit	42264.01
Protein G Midi Bulk Pack Midi G Plugs	12x 1.6 ml	–	–	–	1 kit	42265.01
Starter Kit Mini A and Mini G Plugs	2x 0.23 ml, A & G each	–	–	–	1 kit	42266.01
Protein A Buffer Pack	–	–	–	–	1 kit	42275.01
Protein G Buffer Pack	–	–	–	–	1 kit	42276.01

Complete purification in less than 20 (Mini Kits) / 60 (Midi Kits) minutes

D. Biotinylated Biomolecules

Due to a superior coupling technology, **SERVA Streptavidin Agarose Resin** provides one of the highest binding capacities available with lower non-specific binding and less leaching. Recombinant streptavidin is covalently coupled to a highly crosslinked fine beaded agarose for purification of biotinylated biomolecules like proteins, lectins, antibodies, nucleic acids, receptors and ligands. The binding of biotinylated macromolecules is essentially irreversible because of the harsh conditions needed to disrupt the streptavidin-biotin interaction. This feature makes streptavidin agarose useful in a variety of affinity purification applications.

Product	Binding capacity	Size	Cat. no.
SERVA Streptavidin Agarose Resin	120 nmol/ml	5 ml	42178.01
		10 ml	42178.02

E. Filtration Columns

Proteus Mini Clarification Spin Columns are designed to remove microorganisms, particles and precipitates larger than 0.2 µm pore size from aqueous solutions before HPLC/FPLC separation. The PVDF membrane provides high flow rates and throughput, low extractables and broad chemical compatibility. The membrane binds far less protein than nylon, cellulose or PES membranes. The columns fit all standard microfuges and allow you to process multiple samples in parallel.

Product	Sample capacity	Size	Cat. no.
Proteus Mini Clarification Spin Column, 0.2 µm PVDF membrane	0.65 ml	100 columns	42225.01

Streptavidin Agarose Resin with one of the highest specific activity on the market

Lowest protein binding PVDF membrane, ideal for HPLC/FPLC sample preparation

F. Empty Columns

Proteus 1-Step Batch Plus Spin Columns are designed for small scale protein purifications such as those required for expression trials, solubility determination tests, screening, tittering and scouting studies. These innovative columns incorporate a SelfSeal™ membrane technology which retains the resin and sample in the batch incubation chamber. When the column is spun in a benchtop centrifuge at 750 g (midi spin columns) or at 12,000 – 14,000 g (mini spin columns), the pores of the membrane dilate and the filtered eluate is collected in the bottom of the centrifuge tube.

Product	Volume max.	Size	Cat. no.
1-Step Batch Mini Spin Columns	600 µl	40 columns	42237.01
		100 columns	42238.01
1-Step Batch Midi Spin Columns	20 ml	8 columns	42239.01

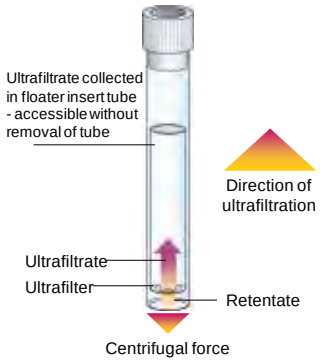
Empty FPLC chromatography columns Both ends of the FliQ columns have 10.32 UNF threads which fit all common chromatography instruments. Pack your own resin into these columns. A 10.32 Packing Connector is also available.

Product	Size	Cat. no.
1 ml FliQ Column	1 column	42278.01
5 ml FliQ Column	1 column	42279.01
10 ml FliQ Column	1 column	42280.01
10.31 Packing Connector	1 piece	42282.01

SelfSeal™ membrane technology to prevent leaking into the collection tube

Ultrafiltration

Ultrafiltration is a fast and simple method for simultaneous concentration of proteins and removal of low molecular weight substances. The unique design of the **Proteus X-Spinner Ultrafiltration Concentrators** allows not only the efficient purification of membrane proteins, but prevents as well the clogging of the membrane by viscous solutions.



Proteus X-Spinner 2.5

- Cellulose triacetate (CTA) membrane for low protein binding
- Contra-design ensures that membranes do not clog
- Recovery rate > 98 % – even with hydrophobic proteins
- Sample volume 0.1 - 2.5 ml
- Hold-up volume is 25 µl
- Available in five different MWCOs

Product	Size	Cat. no.
Proteus X-Spinner 2.5, 5 kDa MWCO	24 columns	42227.01
	96 columns	42228.01
Proteus X-Spinner 2.5, 10 kDa MWCO	24 columns	42229.01
	96 columns	42230.01
Proteus X-Spinner 2.5, 20 kDa MWCO	24 columns	42231.01
	96 columns	42232.01
Proteus X-Spinner 2.5, 100 kDa MWCO	24 columns	42233.01
	96 columns	42234.01
Proteus X-Spinner 2.5, 300 kDa MWCO	24 columns	42235.01
	96 columns	42236.01

For test purposes a Proteus X-Spinner 2.5 trial pack can be ordered, containing 2x 5 kDa, 3x 10 kDa, 2x 20 kDa, 3x 100 kDa and 2x 300 kDa columns:

Product	Size	Cat. no.
Proteus X-Spinner 2.5 Trial Columns, assorted MWCOs	12 columns	42226.01

- **Ideal for membrane proteins and viscous samples**
- **De-proteinization of blood and serum samples**

Protein Purification Kits

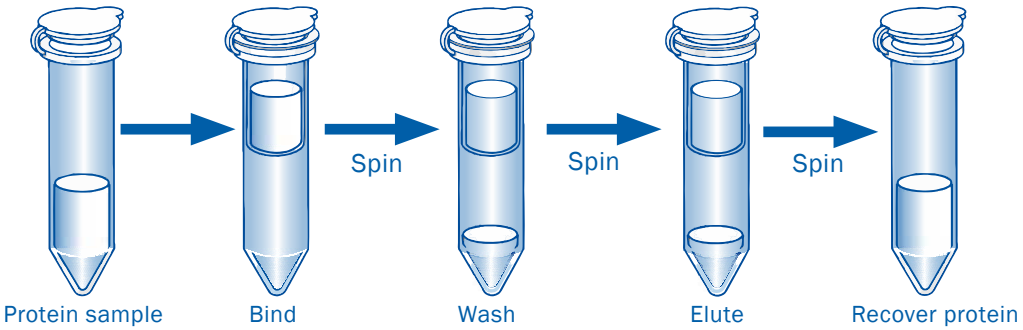
As special applications in protein purification SERVA offers kits for

- Endotoxin removal
- Detergent removal

The **Proteus Detergent Anion Exchange Mini Spin Column Kit** removes excess detergents and concentrates proteins in only 10 minutes.

- Complete detergent exchange/removal
- Binding capacity is 2 mg
- Minimum elution volume is 50 µl

Product	Size	Cat. no.
Proteus Detergent Anion Exchange Mini Spin Columns Kit	20 columns	42241.01
Proteus Detergent Anion Exchange Mini Spin Columns Trial Kit	4 columns	42240.01



The **Proteus NoEndo™** spin column kits offer a standardised method for high grade clearance of endotoxin from recombinant proteins, antibodies and viral vectors.

- Endotoxin-free preparation in less than 1 hour (for M, S, HC)
- SelfSeal™ membrane technology to prevent leaking into the collection tube (µ, M)
- FlowGo™ membrane technology for sample movement regulation (S, HC)
- µ and M-Kits include loose resin and spin columns
- S and HC kits include pre-packed spin columns

Specifications:

Spin columns	NoEndo µ	NoEndo M	No Endo S	NoEndo HC
Binding capacity per column	300 – 500 EU	3,000 EU	30,000 EU	1,000,000 EU
Binding capacity per ml	500 – 800 EU	300 EU	1,500 EU	30,000 EU
Minimum endotoxin levels tested post-column	<0.03 EU/ml	<0.03 EU/ml	<0.05 EU/ml	<0.05 EU/ml
Endotoxin clearance after 1 pass	–	–	3 log reduction	3 log reduction
Endotoxin clearance after 2 passes	–	–	4 log reduction	4 log reduction
Endotoxin clearance after 1 hour incubation	3 log reduction	2 log reduction	–	–
Endotoxin clearance after 3 hour incubation	4 log reduction	3 log reduction	–	–
Maximum sample load volume	0.6 ml	20 ml	20 ml	20 ml
NoEndo resin bed volume	0.01 – 0.1 ml loose	0.25 ml loose	1 ml pre-packed	1.7 ml pre-packed

Proteus NoEndo™ Spin Columns

Product	Size	Cat. no.
Proteus NoEndoμ (Micro) Column Kit	2 columns	42242.01
	24 columns	42246.01
	100 columns	42250.01
Proteus NoEndoM (Mini) Column Kit	2 columns	42243.01
	12 columns	42247.01
	48 columns	42251.01
Proteus NoEndoS (Standard) Column Kit	2 columns	42244.01
	12 columns	42248.01
	48 columns	42252.01
Proteus NoEndoHC (High Capacity) Column Kit	2 columns	42245.01
	12 columns	42249.01
	48 columns	42253.01

Phosphatase Inhibitor Mixes

For studying the roles of kinases and phosphatases in signaling pathways, choosing the right phosphatase inhibitor is very important. To ensure immediate inhibition of all phosphatase acitivities during cell lysis, use SERVA's fine-tuned and also broadly effective inhibitor mixes.

- To isolate proteins in their native phosphorylation state
- One vial is equivalent to 1 ml of 100x concentrate

Product	Application	Size	Cat. no.
Phosphatase Inhibitor Mix I, powder	Contains 5 water soluble phosphatase inhibitors. Inhibits acid and alkaline phosphatases, protein phosphatases 2A, 2B and 2C, phosphoprotein phosphatases, and protein-tyrosine phosphatases.	1 vial	39050.01
		5 vials	39050.02
		10 vials	39050.03
Phosphatase Inhibitor Mix II, solution	Contains 7 phosphatase inhibitors, dissolved in water. Inhibits acid and alkaline phosphatases, protein phosphatases 2A, 2B and 2C, phosphoprotein phosphatases, protein-tyrosine phosphatases, and serine/threonine phosphatases.	1 vial	39055.01
		5 vials	39055.02
		10 vials	39055.03

Protease (PIMG) r protecti of prote proteoly by Neut (lane 5: and 3: P lane 2 a plus NP

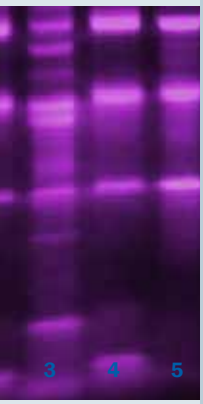
Protease Inhibitor Mixes

During the preparation of cell extracts proteases are inevitably released from bacteria, yeast, tissue or cell cultures. To achieve highest possible recoveries of native proteins the addition of inhibitors of these enzymes is essential.

With SERVA's application-optimized inhibitor mixes there is no need for tedious testing of self-made compositions of various protease inhibitors. Inhibitor mixes as powder are more effective in protease inhibition than other formulations. No splitting of tablets at lower volumes is necessary.

- Efficient protection of proteins against proteolytic degradation
- One vial is equivalent to 1 ml of 100x concentrate
- DMSO for resuspension included for all non-water soluble mixtures

Product	Application	Size	Cat. no.
Protease Inhibitor Mix G	For general applications, and where the use of organic solvents should be avoided. Contains 5 water soluble protease inhibitors. Inhibits cysteine, serine- and metallo-proteases.	1 vial	39101.01
		5 vials	39101.02
		10 vials	39101.03
Protease Inhibitor Mix M	For use with extracts from mammalian tissue. Contains 6 protease inhibitors. Inhibits aspartate-, cysteine-, serine-, and metallo-proteases as well as aminopeptidases.	1 vial	39102.01
		5 vials	39102.02
		10 vials	39102.03
Protease Inhibitor Mix P	For use with plant extract. Contains 6 protease inhibitors. Inhibits aspartate-, cysteine-, serine-, and metallo-proteases as well as aminopeptidases.	1 vial	39103.01
		5 vials	39103.02
		10 vials	39103.03
Protease Inhibitor Mix FY	For use with fungus and yeast extracts. Contains 4 protease inhibitors. Inhibits aspartate-, cysteine-, serine-, and metallo-proteases.	1 vial	39104.01
		5 vials	39104.02
		10 vials	39104.03
Protease Inhibitor Mix B	For use with bacterial extracts. Contains 5 protease inhibitors. Inhibits aspartate-, cysteine-, serine-, and metallo-proteases as well as aminopeptidases	1 vial	39105.01
		5 vials	39105.02
		10 vials	39105.03
Protease Inhibitor Mix HP	For purification of polyHis-tagged proteins. Contains 4 water soluble protease inhibitors. Inhibits cysteine- and serine-proteases.	1 vial	39106.01
		5 vials	39106.02
		10 vials	39106.03
Protease Inhibitor Mix HP Plus	For purification of polyHis-tagged proteins. Contains 6 protease inhibitors. Inhibits aspartate-, cysteine- and serine-proteases as well as aminopeptidases, Thermolysin and other microbial metallo-proteases.	1 vial	39107.01
		5 vials	39107.02
		10 vials	39107.03



e Inhibitor Mix G mediated efficient on ins against tic degradation ral Protease (NP) Control, lane 1 Proteins plus NP; nd 4: Proteins plus PIMG)

- **Reduced health risk in handling of protease and phosphatase inhibitors**
- **Also available: individual protease inhibitors for customized applications**

Protein Quantification

Accurate determination of protein concentration is essential in the protein analysis workflow. Although there are a wide variety of protein assays available, none of the assays can be used without first considering their suitability for the application. Each assay has its own advantages and limitations and often it is necessary to obtain more than one type of protein assay for research applications.

Standard assays for protein quantification

Bradford reagent, 5x concentrate
- Suitable for micro (1 – 25 µg protein/ml) and standard (0.1 – 1mg protein/ml) assays

Lowry Assay Kit
- Contains ready-to-use reagents including protein standard solution

Improved assays compatible with detergents and reducing agents

BCA Assay Kit
- Assay based on bicinchoninic acid method
- Compatible with many detergents
- Less binding variation between different proteins than Bradford assay

SingleQuant Assay Kit
- Based on the method of Popov*
- No interference with detergents and reducing agents
- Detection of 2 µg to 1,400 µg per sample

SERVA Purple Protein Quantification Assay
- A non-toxic, eco-friendly fluorescent dye assay
- Compatible with many detergents and reducing agents
- Accurate staining of glyco-, phospho-, hydrophobic proteins and peptides
- Single tube (200 assays), 96- or 384-well-format for HTS (up to 10.000 assays)
- Detection limit of 100 ng/ml for peptides and 40 ng/ml for proteins

Product	Description	Size	Cat. no.
Bradford reagent, 5x concentrate	For protein quantification after Bradford	50 ml	39222.01
		200 ml	39222.02
		500 ml	39222.03
Lowry Assay Kit	For protein quantification after Lowry	250 tests	39236.01
BCA Protein Assay Micro Kit	Based on bicinchoninic acid method	480 tests	39229.01
BCA Protein Assay Macro Kit	Based on bicinchoninic acid method	250 tests	39228.01
		500 tests	39228.02
SingleQuant Assay Kit	Based on the assay method of Popov	200 tests	39226.01
SERVA Purple Protein Quantification Assay	Based on fluorescent dye SERVA Purple	10 ml	39235.01

* Popov, N. et. Al. (1975) Acta Biol. Med. Ger. 34(9), 1441–1446

Fast, reliable and reproducible measurement of protein concentrations

Improved assays for less sample buffer-mediated restrictions

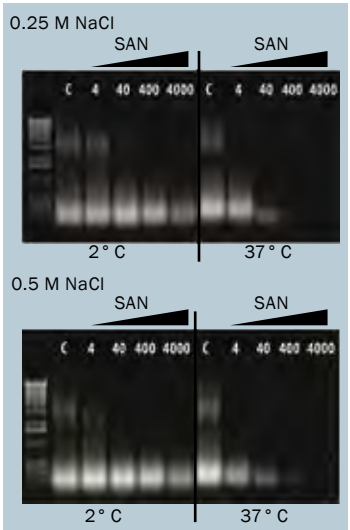
Enzymes Used in Sample Preparation

Salt Active Nuclease

Engineered highly active non-specific endonuclease that tolerates reaction conditions with high salt concentrations.

Salt is an important component of various purifications schemes. The presence of salt can minimize aggregation, increase target solubility and improve target yield. High salt enables contaminating DNA to dissociate from associated proteins and become available for degradation. The optimal activity at high salinity, the resistance to non-ionic detergents and the easy inactivation and separation of the enzyme from other proteins make Salt Active Nuclease the superior choice for DNA digestion in the protein purification workflow.

- Only nuclease with an optimum activity in 0.5 M NaCl
- Active at low temperatures and high pH range
- Easily inactivated by denaturing reagents
- Due to high pI of 9.6 easily removed by cationic exchange columns
- SAN High Quality for removal of nucleic acids in manufacturing and bioprocessing of therapeutic proteins, viruses and similar compounds
- SAN High Quality ELISA for demonstration of removal



Incubation of E. coli lysate with increasing units of Salt Active Nuclease for 30 min

Product	Size	Cat. no.
Salt Active Nuclease, solution	5,000 U	18541.01

TEV Protease, recombinant

- Highly site-specific cysteine protease for the very efficient removal of fusion tags from recombinant proteins
- Genetically modified to increase activity and resistance to autolysis
- Contains a N-terminal polyhistidine tag for easy removal from the cleavage reaction by affinity chromatography
- Supplied with 1 ml 20x TEV Reaction Buffer and 100 mM DTT

Product	Size	Cat. no.
TEV Protease, recombinant, 10 U/µl, solution	1,000 U	36401.01

- **Effective reduction of viscosity caused by nucleic acids for shorter processing time and increased yield of proteins**
- **TEV Protease with increased activity for very efficient removal of fusion tags**

Nucleic Acid Sample Preparation

Enzymes

Cell wall degrading enzymes

Lysozyme from chicken egg white

- Lysis of bacterial cells for extraction of nucleic acids
- Used for preparation of spheroplasts

Zymolyase® from *Arthrobacter luteus*

- Enzyme complex with strong lytic activity against living yeast cell walls
- Used for preparation of protoplasts or spheroplasts of various yeast strains

Product	Size	Cat. no.
Lysozyme from chicken egg white, min. 15,000 U/mg, cryst.	2.5 g	28263.01
	10 g	28263.02
Zymolyase® von *Arthrobacter luteus*, min. 20 U/mg lyophil.	100 mg	33759.01
	500 mg	33759.02
Zymolyase® von *Arthrobacter luteus*, min. 100 U/mg lyophil.	100 mg	33760.01
	500 mg	33760.02

Protein degrading enzymes

Proteinase K from *Tritirachium album*

- Free of endonucleases, exonucleases, and ribonucleases
- Recombinant enzymes with very low DNA content

Pronase E from *Streptomyces griseus*

- Very stable in the pH range 6.0 – 9.0
- Complete inactivation by heating at greater than 80 °C for 15 - 20 minutes

Product	Size	Cat. no.
Proteinase K from *Tritirachium album*, min. 30 mAnson-U/mg	25 mg	33752.01
	100 mg	33752.02
	500 mg	33752.03
Proteinase K from *Tritirachium album* solution, 20 mg solid/ml, ≥ 600 mAnson-U/ml	1 ml	33755.01
	5 ml	33755.02
	10 ml	33755.03
Proteinase K, recombinant, min. 30 mAnson-U/mg, lyophil., molecular biology grade	100 mg	33756.02
	500 mg	33756.03
Proteinase K, recombinant, min. 35 mAnson-U/mg, lyophil., NGS grade	25 mg	33757.03
	100 mg	33757.02
	500 mg	33757.03
Pronase E from *Streptomyces griseus*, min. 5.0 DMC-U/mg, lyophil.	250 mg	33635.01
	1 g	33635.02
	5 g	33635.03

Nucleic acid degrading enzymes

dsDNase, heat labile

- Removal of genomic DNA from RNA preparations prior to RT-qPCR
- Irreversible inactivation by heat treatment at 5 - 15 min at 55 ˚C, 1 mM DTT, pH ≥ 8

Ribonuclease A from bovine pancreas

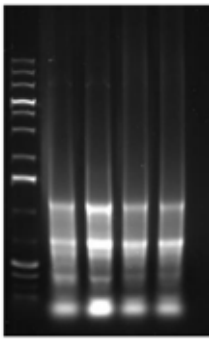
- Removal of RNA from preparations of plasmid DNA and protein samples
- Free of DNase, protease, and salt

Product	Size	Cat. no.
dsDNase, heat labile, specific activity ca. 200,000 U/mg, solution	250 U	18545.01
Ribonuclease A from bovine pancreas, min. 80 Kunitz units/mg, lyophil., DNase free	50 mg	34388.01
	250 mg	34388.02

Buffers

BlueZol

- For the rapid isolation of total RNA from cells and tissues of human, animal, plant, yeast or bacterial origin
- Suitable for the simultaneous isolation of RNA, DNA and protein from one sample
- Purified RNA is ideal for any downstream applications such as RT-PCR, *in vitro* translation, Northern Blotting, RNase protection assays or dot blot hybridization
- Purified DNA can be used for PCR and Southern Blotting and the proteins for Western Blotting



Lane 1: kb Marker
Lane 2 - 5: Total RNA preparations from rat liver

CTAB DNA Extraction Buffer

- Ready-to-use buffer with the non-ionic detergent cetyltrimethylammonium-bromide (CTAB)
- For removal of polysaccharides contamination during isolation of DNA from plants
- By adjustment of salt concentration in lysates containing CTAB, polysaccharides and DNA can be differentially precipitated

Product	Size	Cat. no.
BlueZol, lysis reagent for cells and tissues	100 ml	39808.01
CTAB DNA Extraction Buffer, molecular biology grade	500 ml	39809.01

SERVA

serving scientists

SERVA WORLDWIDE

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Version 22/05