



Protein Sample Preparation

SERVA

Reagents and Consumables

Affinity Chromatography

Gelfiltration

Ultrafiltration

Protein Purification Kits

Phosphatase Inhibitor Mixes

Protease Inhibitor Mixes

Protein Quantification

Enzymes

Protein Sample Preparation

Reliable and efficient **protein sample preparation** is one of the most crucial steps for achieving optimal and reproducible results in all tasks of protein analysis.

Gelfiltration, ultrafiltration or the highly selective **affinity chromatography** are the main tools for purification of proteins from supernatants of cell and tissue extracts. These methods are complemented by protein purification kits and 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.

All **SERVA reagents** for sample preparation are of **premium grade**, subjected to stringent quality control. In addition SERVA offers a broad range of detergents and dialysis tubings in different formats. For more information on these products in protein sample preparation please refer to the complementary brochures “Detergents” and “Dialysis Tubings”.

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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.

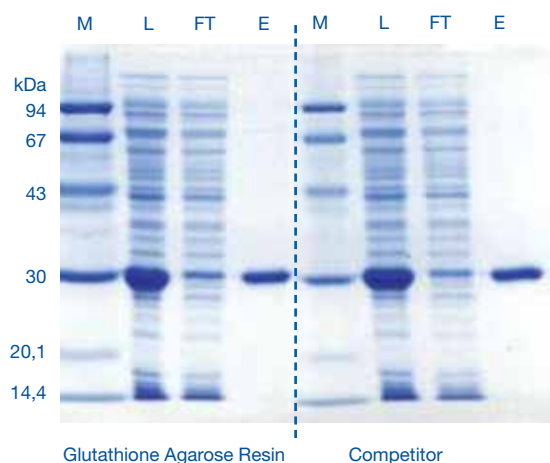
A. GST-Tag Purification

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.

Because the affinity of GST for its substrate is in the submillimolar range, immobilization of glutathione on an agarose matrix makes a highly efficient affinity chromatography resin.

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.



Glutathione Agarose Resin

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

Thrombin from bovine plasma is suitable for removal of the GST-tag from a recom-

binant fusion protein containing an accessible thrombin recognition sequence.

Product	Specific Activity	Size	Cat. no.
Thrombin, from bovine plasma, lyophil.	Min. 1000 U/mg	250 U	36402.01
		1000 U	36402.02
		5000 U	36402.03

Protein Ark HiFlu GST FPLC Columns

are pre-packed and ready to use for rapid affinity purification of tagged proteins under native conditions. Available in 1 ml and 5 ml HiFlu column sizes with high ligand density and high binding capacity. Compatible with all common HPLC and FPLC instruments (including ÄKTA™

FPLCs), and low pressure pumps and syringes using an appropriate adaptor.



HiFlu GST FPLC Columns

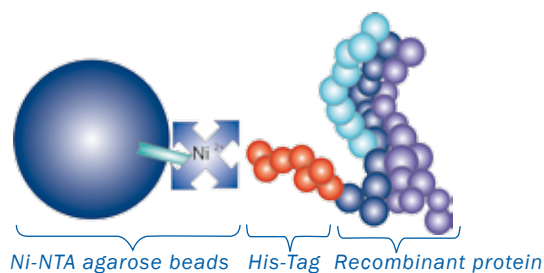
Product	Binding capacity	Size	Cat. no.
1 ml HiFlu GST FPLC Column	10 mg/ml	1 column	42291.01
		5 columns	42292.01
5 ml HiFlu GST FPLC Column	10 mg/ml	1 column	42293.01
		5 columns	42294.01

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, forming chelated complexes. The transition metals are bound through a chemical reaction to the agarose beads, giving the agarose an activation degree.

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. This makes 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.

Low Pressure NTA Agarose Resins

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

High Pressure NTA Agarose Resins

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

Ni-NTA Magnetic Agarose Beads

Product	Binding capacity	Size	Cat. no.
Ni-NTA	75 mg/ml	2 ml	42179.01
		10 ml	42179.02
SERVAMag Rack	-	1 unit	MR-01



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

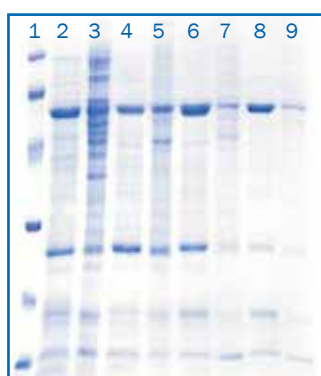
HiFloQ/FPLC Columns

Product	Volume	Binding capacity	Size	Cat. no.
Ni-NTA	1 ml	50 – 75 mg/ml	1 column	42283.01
			5 columns	42284.01
	5 ml		1 column	42285.01
			5 columns	42286.01
Co-NTA	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. This resin is loaded with a divalent metal (Ni^{2+} , Co^{2+} , Zn^{2+} or Cu^{2+}). IDA has three sites available for inter-

action with metal ions, instead of four with NTA. Therefore IDA resins are usually more easily regenerated allowing an easier elution of bound proteins with lower concentrations of imidazole.

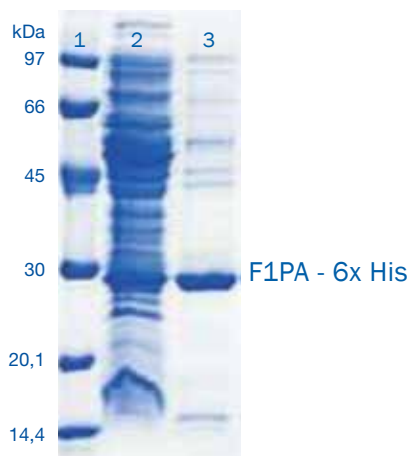
- Low density (LD) for higher specificity
- High density (HD) for higher affinity
- Cu^{2+} and Co^{2+} for higher affinity and lower specificity
- Ni^{2+} and Zn^{2+} for higher specificity and lower affinity



- 1: Marker
- 2: SERVA IDA- Cu^{2+} -Resin
- 3: Competitor IDA- Cu^{2+} -Resin
- 4: SERVA IDA- Ni^{2+} -Resin
- 5: Competitor IDA- Ni^{2+} -Resin
- 6: SERVA IDA- Zn^{2+} -Resin
- 7: Competitor IDA- Zn^{2+} -Resin
- 8: SERVA IDA- Co^{2+} -Resin
- 9: Competitor IDA- Co^{2+} -Resin

Purification of His-tagged proteins by Ni-IDA:

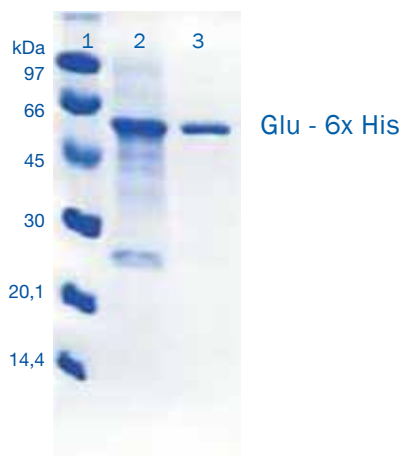
Unpurified extract containing Fucose 1-aldolase (6xHis) was purified from crude extract with SERVA Ni-IDA HD Mini Columns.



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

Purification of His-tagged proteins by Co-IDA:

Unpurified extract containing Glutaryl acylase (6xHis) was purified from crude extract with SERVA Co-IDA HD Mini Column.



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

Gravity Flow Columns

Product	Volume	Loading capacity Me ²⁺ /ml	Size	Cat. no.
SERVA Ni-IDA HD Mini Column	1 ml	20 - 40 µmol	8 columns	42148.01
	5 ml		5 columns	42149.01
SERVA Co-IDA HD Mini Column	1 ml		8 columns	42152.01
	5 ml		5 columns	42153.01

Low Pressure Loose IDA Agarose Resins

Product	Activation grade	Loading capacity Me ²⁺ /ml	Size	Cat. no.
Metal-Free IDA	HD	20 - 40 µmol	25 ml	42140.01
			100 ml	42140.02
	LD	5 - 20 µmol	25 ml	42144.01
			100 ml	42144.02
Ni-IDA	HD	20 - 40 µmol	25 ml	42141.01
			100 ml	42141.02
	LD	5 - 20 µmol	25 ml	42145.01
			100 ml	42145.02
Co-IDA	HD	20 - 40 µmol	25 ml	42143.01
			100 ml	42143.02
	LD	5 - 20 µmol	25 ml	42147.01
			100 ml	42147.02
Zn-IDA	HD	20 - 40 µmol	25 ml	42142.01
			100 ml	42142.02
	LD	5 - 20 µmol	25 ml	42146.01
			100 ml	42146.02

Test kits for affinity chromatography

will help you to find the best option for your protein type. The choice of resin depends on whether binding capacity

or selectivity is more important for purification and whether the protein is easy or difficult to separate.

Test Kits

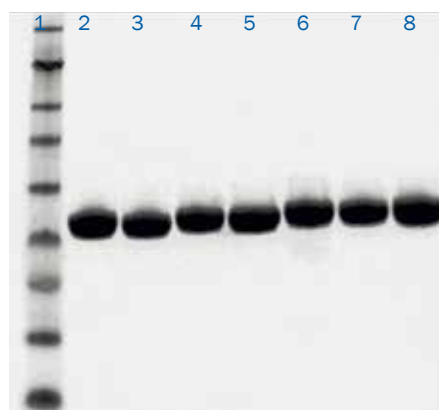
Type	IDA resin (2 ml each)	Columns	Size	Cat. no.
IMAC HD	Metal-Free, Ni, Zn, Co	no	1 kit	42160.01
		40	1 kit	42161.01
IMAC LD	Metal-Free, Ni, Zn, Cu	no	1 kit	42162.01
		40	1 kit	42163.01
IMAC Ni-IDA	Ni-HD, Ni-LD	no	1 kit	42164.01
		20	1 kit	42165.01
IMAC Ni-/Co-IDA	Ni-HD, Ni-LD, Co-HD	no	1 kit	42166.01
		30	1 kit	42167.01

The Proteus Ni-IMAC kit is designed for simple, rapid His-tagged recombinant protein purification from a cell lysate under native or denaturing con-

ditions. 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. 6 x Purified Mutant Proteins

Proteus Ni-IMAC Kits

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

Ni²⁺-IDA-Metal Chelate Sepharose® Resin for High Pressure Chromatography

Type	Pressure max.	Binding capacity	Size	Cat. no.
Ni-IDA	42 psi	10 mg/ml	25 ml	42315.01
			100 ml	42316.01

The cost-effective **loose resin** is suitable for batch and column purification. SERVA offers empty columns for smaller and larger volumes from 50 µl up to

6 ml. For more information on empty columns please refer to chapter “Empty Columns” at page 11.

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. Binding affinity varies depending upon the source species and subclass.

Recombinant Protein A/G Sepharose® Resin

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

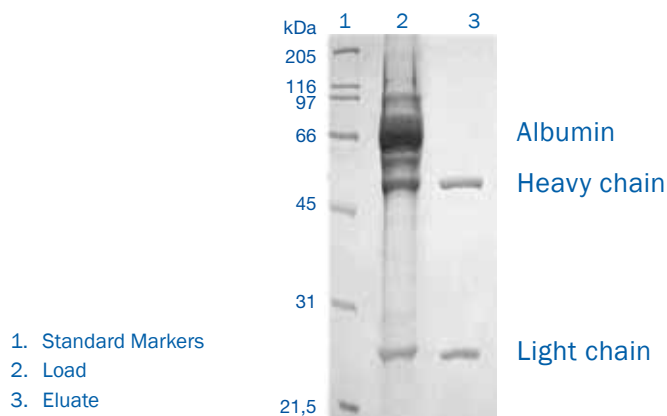
HiFliQ Protein A/G FPLC Columns

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

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.



Proteus Protein A/G Kits

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

Streptavidin Agarose Resin

Volume	Binding capacity	Size	Cat. no.
SERVA Streptavidin Agarose Resin	330 nmol/ml	2 ml	42177.01
		5 ml	42177.02
		10 ml	42177.03

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. These are ideal for HPLC/FPLC sample preparation. 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.

Proteus Mini Clarification Spin Columns

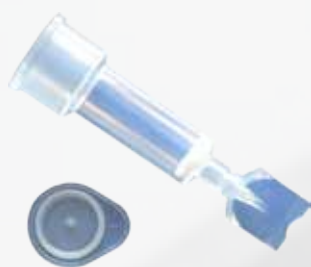
Type	Process	Sample Capacity	Pore size	Size	Cat. no.
Mini	Centrifugation	0.65 ml	0.2 µm	100 columns	42225.01



- 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

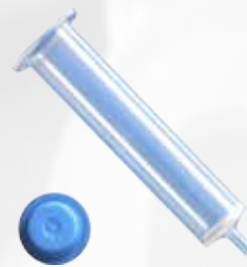
Mini/Midi/Maxi Columns for purification by gravity flow. Polypropylene columns containing a polyethylene frit.



Cat. no. 42173



Cat. no. 42176



Cat. no. 42174

Mini/Midi/Maxi Columns

Type	Process	Resin Capacity	Sample Capacity	Frit Pore size	Size	Cat. no.
Mini	Centrifugation	100 – 250 µl	1.5 ml	25 µm	25 columns	42173.01
					100 columns	42173.02
Mini Spin	Centrifugation or syringe	50 – 100 µl	0.8 ml	35 µm	25 columns	42176.01
Midi	Gravity flow	0.5 – 2.0 ml	12 ml	20 µm	50 columns	42174.01
Maxi		2 – 6 ml	35 ml		50 columns	42175.01

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, titrating 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 (for midi spin columns) or at 12 – 14,000 g (for mini spin columns), the pores of the membrane dilate and the filtered eluate is collected in the bottom of the centrifuge tube.

1-Step Batch Spin Columns

Type	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 column.

Both ends of the FliQ columns have 10.32 UNF threads which fit all common chroma-

tography instruments. Pack your own resin into these columns. The 10.32 Packing Connector is available under 42282.01.

FPLC Columns

Product	Size	Cat. no.
1 ml FliQ Column	1 column	42278.01
5 ml FliQ Column		42279.01
10 ml FliQ Column		42280.01
20 ml FliQ Column		42281.01

Gelfiltration

For gelfiltration of protein samples SERVA offers ready-to-use CentriPure and CentriPure Mini Spin Columns from emp Biotech. The gel matrix Zetadex, a new cross-linked composite dextran matrix, has been proven

to be superior for desalting, buffer exchange and removal of small molecular impurities, such as salts, ammonia, dyes, biotin, haptens etc. from antibodies, enzymes and other proteins.

- Hydrated, ready-to-use gel filtration columns
- Processing of small and large sample volumes possible
- Available as flow gravity or spin columns
- Fast and easy handling
- High yield and high purity
- Minimal effect of buffer and pH on resolution
- Purified biomolecules are directly suited for downstream applications, like SDS PAGE, mass spectrometry, X-ray crystallisation



CentriPure Gelfiltration Columns

Ready-to-use flow gravity columns for rapid purification of proteins from small to large sample volumes

Product	Description	Size	Cat. no.
CentriPure P2 Columns	<ul style="list-style-type: none"> Size exclusion cut-off: 10 kDa Sample volume: up to 200 µl Elution volume: 200 to 350 µl 	2 columns	42100.01
		50 columns	42101.01
CentriPure P5 Columns	<ul style="list-style-type: none"> Size exclusion cut-off: 10 kDa Sample volume: up to 0.5 ml Elution volume: 1 ml 	2 columns	42102.01
		50 columns	42103.01
CentriPure P10 Columns	<ul style="list-style-type: none"> Size exclusion cut-off: 10 kDa Sample volume: up to 1 ml Elution volume: 1.2 to 1.5 ml 	2 columns	42104.01
		50 columns	42105.01
CentriPure P25 Columns	<ul style="list-style-type: none"> Size exclusion cut-off: 10 kDa Sample volume: up to 2.5 ml Elution volume: 2.7 to 3.5 ml 	2 columns	42106.01
		25 columns	42107.01
CentriPure P50 Columns	<ul style="list-style-type: none"> Size exclusion cut-off: 10 kDa Sample volume: up to 5 ml Elution volume: 6 to 8 ml 	1 column	42108.01
		10 columns	42109.01
CentriPure P100 Columns	<ul style="list-style-type: none"> Size exclusion cut-off: 10 kDa Sample volume: up to 10 ml Elution volume: 12 to 15 ml 	1 column	42110.01
		10 columns	42111.01
CentriPure P500 Columns	<ul style="list-style-type: none"> Size exclusion cut-off: 10 kDa Sample volume: up to 50 ml Elution volume: 65 to 70 ml 	1 column	42112.01

- Fast and easy handling
- Minimal effect of buffer and pH on resolution

CentriPure Mini Spin Gelfiltration Columns

Ready-to-use spin columns for quick and efficient protein purification from small sample volumes

Product	Description	Size	Cat. no.
CentriPure Mini Spin Columns Desalt Z-50	<ul style="list-style-type: none"> Five minutes protocol Purified proteins are eluted into pure, deionized water with minimal dilution Size exclusion cut-off: 25 kDa Sample volume: 10 to 100 µl 	4 columns	42113.01
		25 columns	42114.01
		100 columns	42115.01
CentriPure Mini Spin Columns TRIS Z-50	<ul style="list-style-type: none"> Five minutes protocol Purified proteins are eluted into 1 mM TRIS, pH 6 with minimal dilution Size exclusion cut-off: 25 kDa Sample volume: 10 to 100 µl 	4 columns	42124.01
		25 columns	42125.01
		100 columns	42126.01
CentriPure Mini Spin Columns PBS Z-50	<ul style="list-style-type: none"> Five minutes protocol Purified proteins are eluted into Phosphate Buffered Saline (PBS, pH 7) with minimal dilution Size exclusion cut-off: 25 kDa Sample volume: 10 to 100 µl 	4 columns	42127.01
		25 columns	42128.01
		100 columns	42129.01
CentriPure Mini Spin Columns Desalt Z-25	<ul style="list-style-type: none"> Five minutes protocol Purified proteins are eluted into pure, deionized water with minimal dilution Size exclusion cut-off: 5 kDa Sample volume: 10 to 100 µl 	4 columns	42130.01
		25 columns	42131.01
		100 columns	42132.01
CentriPure Mini Spin Columns TRIS Z-25	<ul style="list-style-type: none"> Five minutes protocol Purified proteins are eluted into 1 mM TRIS, pH 6 with minimal dilution Size exclusion cut-off: 5 kDa Sample volume: 10 to 100 µl 	4 columns	42133.01
		25 columns	42134.01
		100 columns	42135.01
CentriPure Mini Spin Columns PBS Z-25	<ul style="list-style-type: none"> Five minutes protocol Purified proteins are eluted into Phosphate Buffered Saline (PBS, pH 7) with minimal dilution Size exclusion cut-off: 5 kDa Sample volume: 10 to 100 µl 	4 columns	42136.01
		25 columns	42137.01
		100 columns	42138.01



Column Preparation



Sample Application



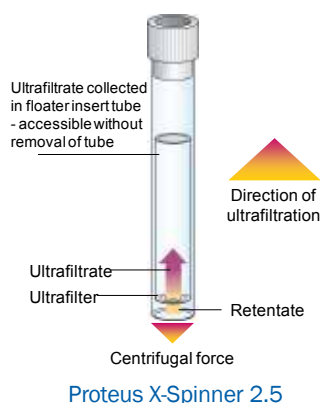
Sample Elution

- High yield and high purity
- Purified biomolecules are directly suited for downstream applications, like SDS PAGE, mass spectrometry, X-ray crystallisation

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.



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

Proteus X-Spinner Ultrafiltration Concentrators

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

2 x 5 kDa, 3 x 10 kDa, 2 x 20 kDa, 3 x 100 kDa and 2 x 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

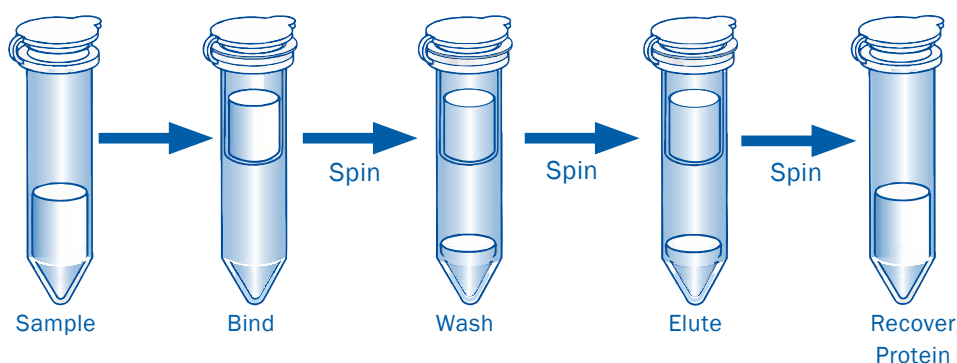
- Endotoxin removal
- Detergent removal
- Serum protein removal

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

Proteus Detergent Anion Exchange Mini Spin Column Kit

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:

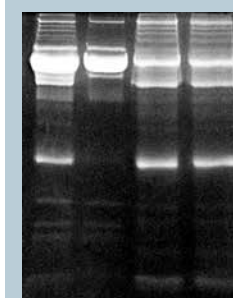
Spin Columns	NoEndo µ	NoEndo M	No Endo S	NoEndo HC
Binding capacity per column	300 – 500 EU	3,000 EU	30,000 EU	1,000,000 EU
Binding capacity per ml	500 – 800 EU	300 EU	1,500 EU	30,000 EU
Minimum endotoxin levels tested post-column	<0.03 EU/ml	<0.03 EU/ml	<0.05 EU/ml	<0.05 EU/ml
Endotoxin clearance after 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
Proteus NoEndoµ (Micro) Column Kit	100 columns	42250.01
	2 columns	42243.01
Proteus NoEndoM (Mini) Column Kit	12 columns	42247.01
	48 columns	42251.01
Proteus NoEndoS (Standard) Column Kit	2 columns	42244.01
	12 columns	42248.01
Proteus NoEndoHC (High Capacity) Column Kit	48 columns	42252.01
	2 columns	42245.01
Proteus NoEndoHC (High Capacity) Column Kit	12 columns	42249.01
	48 columns	42253.01

SERVA BluePrep Major Serum Protein Removal Kit provides a fast and simple procedure for the effective depletion of albumin, alpha-antitrypsin, transferrin and haptoglobin from serum and plasma samples.

- | Spin column ion exchange chromatography to deplete
 - Albumin (70 %)
 - alpha-Trypsin (90 %)
 - Transferrin (50 %)
 - Haptoglobin (50 %)
- | Process 10 samples in only 30 minutes
- | Downstream compatible for MS, microarrays and electrophoresis



Depletion of
teins.

Lane 1: Human
Lane 2: Flow-
proteins;
Lanes 3 and
hout interfer-
serum prote

SERVA BluePrep Major Serum Protein Removal Kit

Product	Size	Cat. no.
SERVA BluePrep Major Serum Protein Removal Kit	42079.01	25 reactions

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 activities 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

Phosphatase Inhibitor Mixes

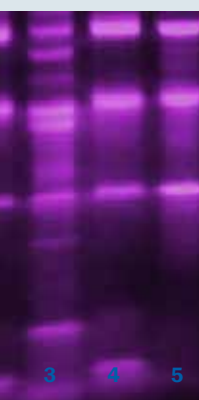
Product	Application	Size	Cat. no.
Phosphatase Inhibitor Mix I, powder	Contains 5 water soluble phosphatase inhibitors. Inhibits acid and alkaline phosphatases, protein phosphatases 2A, 2B and 2C, phosphoprotein phosphatases, and protein-tyrosine phosphatases.	1 vial	39050.01
		5 vials	39050.02
		10 vials	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

1 2

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proteins plus NP;
and 4: Proteins
plus PIMG)

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

Protease Inhibitor Mixes

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

- Reduced health risk in handling of protease and phosphatase inhibitors
- Also available: over 20 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 con-

sidering 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 / ProtaQuant Assay kit
 - Based on the method of Popov*
 - No interference with detergents and reducing agents
 - Single tube format and 96-well-format for HTS
 - Detection of 2 µg to 1,400 µg per sample (SingleQuant)
 - Detection of 100 µg to 2,000 µg protein per sample (ProtaQuant)
- | 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

Description	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, single tube format	200 tests	39226.01
		600 tests	39226.02
ProtaQuant Assay Kit	Based on the assay method of Popov, 96-well-plate format	1 kit	39225.01
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

Cyanase™ Nuclease

Cyanase™ is a cloned highly active non-specific endonuclease that degrades single and double stranded DNA and RNA in as little as 1 minute. Because of its unique properties, Cyanase™ is effective for cell

lysate clearance, protein and viral purification and nucleic acid clearance from samples. It is easily removed from samples by using a highly specific Cyanase Inactivation Resin.

- | Fastest nuclease on the market
- | Active over a broad pH range
- | Unaffected by lysozyme or detergent
- | Easily inactivated and removed by Cyanase Inactivation Resin
- | Unsurpassed stability, can be stored up to 1 year at room temperature with minimal loss of activity



Incubation of full length λ DNA at 37 °C for 1 min with various nucleases

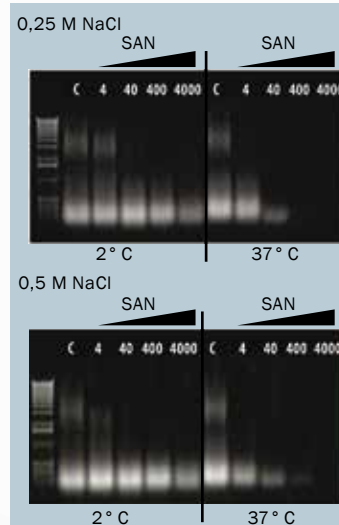
Salt Active Nuclease

Salt Active Nuclease is a highly active non-specific endonuclease from a marine bacterium that cleaves both DNA and RNA. The only enzyme that can digest DNA in high salt concentrations, neces-

sary for the dissociation of DNA-protein complexes. Because it can be inactivated by reducing agents, it is best suited for treatment of eluates of e.g. His-Tag chromatography columns.

- | The only nuclease active in high salt concentrations (0.5 M NaCl)
- | Active at low temperatures (20 % at 6 °C)
- | Broad pH range
- | Easily inactivated by reducing agents

Product	Size	Cat. no.
Cyanase™ Nuclease	10,000 U	18542.01
	25,000 U	18542.02
Cyanase™ Inactivation Resin	1 ml	18543.01
	5 ml	18543.02
Cyanase™ Inactivation Resin Cartridges	20 pcs.	18544.01
Salt Active Nuclease	5,000 U	18541.01



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

- | Effective reduction of viscosity caused by nucleic acids for shorter processing time and increased yield of proteins
- | Samples can be applied to all downstream applications due to complete removal of Cyanase

SERVA

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