

# Don't mess around with protein prep.

ÄKTAprime™ plus



imagination at work

# Reliable results come automatically

Automating protein preparation ensures more reliable results. With an automated system, you eliminate the problem of sample loss through spillage or misplaced tubes, ensuring you get more of the target protein. And because the system always

performs purification processes consistently, you are assured of reliably high purity levels and greater reproducibility. You'll also save hours on purification, so you can focus on other work.

## **Purify any protein**

Now you can purify any protein with ease – whether tagged or untagged.

## **At the touch of a button**

There are preprogrammed templates with optimized protocols for the most typical applications. Just press a button and the system does the rest.

## **Your results will be reproducible**

Thanks to optimized purification protocols together with convenient prepacked columns, yields and purity are extremely consistent.

## **Just walk away**

The system takes care of all liquid handling – just apply your sample and walk away. Forget about the mess and risk of errors when doing manual steps such as pipetting or centrifuging.

## **Come back when it's ready**

No more messing around with changing collection vessels – your protein is delivered straight to the tubes for you.

## **You always know where your protein is**

The UV and conductivity monitor enables automated tracking of your protein. The easy-to-use software lets you monitor the purification process in real time. You'll always know exactly where your protein is at every stage.

## **There's no sample loss**

No more guesswork – you can now be certain that your elution was efficient. And risk of spillage during handling is minimal.

## **Evaluation is taken care of for you**

The system's software handles evaluation automatically, saving you time. Results are presented in a nice report format ready for publication.

# Pure simplicity in action

ÄKTAprime plus is a compact liquid chromatography system designed for one-step purification of proteins. Many protein purification activities can be carried out just by pressing a button. The system is pure simplicity to operate, with everything controlled

from push buttons and an easy-to-navigate LCD display on the front panel. With ÄKTAprime plus, reliable and convenient laboratory scale protein purification is no longer pure imagination.



# Purification at the touch of a button

For some of the most typical applications there are pre-programmed methods with optimized protocols for defined columns. All parameters are

preset – all you need to do is enter the sample volume and press start. So you can turn common purification steps into routine push-button

procedures. Recommended columns to be used together with application templates for ÄKTAprime plus are pre-packed HiTrap™ and HiPrep™ columns.

## Application templates for typical applications

### Histidine-tag Purification HiTrap

Automated method using HiTrap column and gradient elution for maximum capacity and purity.

### IMAC Purification Uncharged HiTrap

Automated charging of column when other metal ions than Ni are preferred, to improve purification of histidine-tagged proteins.

### GST-tag Purification GSTrap

Automated method optimized for the purification of GST-tagged proteins.

### Affinity Purification Any HiTrap

Generic method for any affinity media packed in a HiTrap.

### mAb Purification IgM Purification

A set of protocols using different media depending on the kind of mAb to be purified.

### Buffer Exchange HiPrep

Convenient method to automatically get your protein in the right buffer.

### Albumin Removal HiTrap Blue

Automated protocol for removal of contaminating albumin.

### Ion Exchange HiTrap SP

Generic purification method for untagged proteins.

### On-column Refolding HiTrap

Automated protocol for refolding of inclusion bodies of histidine-tagged proteins.

## HiTrap column list

HiTrap™ HP	5 x 1 ml 17-5247-01
HiTrap Chelating HP	5 x 1 ml 17-0408-01
GSTrap HP	5 x 1 ml 17-5281-01
HiTrap Benzamidine FF	2 x 1 ml 17-5143-02
HiTrap Protein G HP	2 x 1 ml 17-0404-03
HiTrap Protein A HP	2 x 1 ml 17-0402-03
HiTrap rProtein A FF	2 x 1 ml 17-5079-02
HiTrap IgM Purification HP	5 x 1 ml 17-5110-01
HiTrap Blue HP	5 x 1 ml 17-0412-01
HiTrap Desalting	5 x 5 ml 17-1408-01
HiPrep 26/10 Desalting	1 (53 ml) 17-5087-01
HiTrap IEX Selection Kit	7 x 1 ml 17-6002-33



ÄKTAprime plus also includes pre-programmed method templates for more generic protocols in common techniques such as ion exchange,

hydrophobic interaction, affinity or desalting/buffer exchange. Since it is an ÄKTA system you also have the flexibility to choose line-by-line

programming for a totally customized method.

### Generic method templates for common chromatography techniques

#### Gel Filtration Chromatography (GF)

Gel filtration (size exclusion) chromatography separates proteins with differences in molecular size.

#### Ion Exchange Chromatography (IEX)

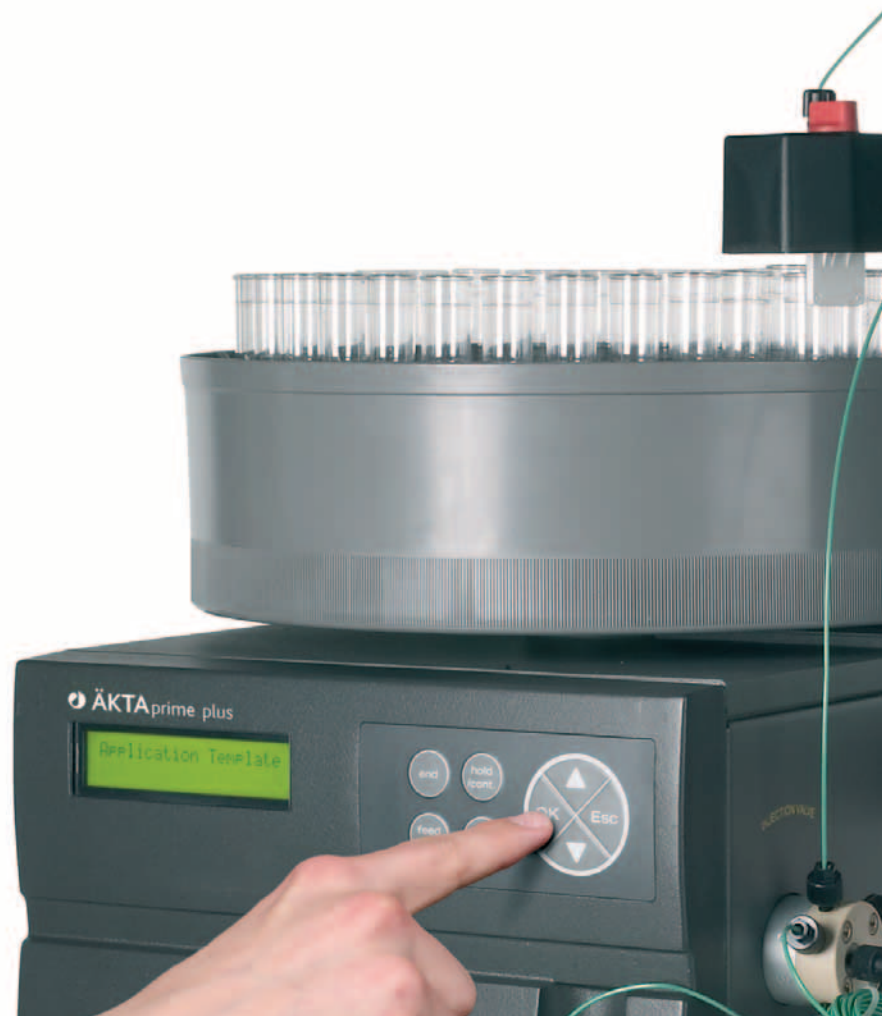
IEX separates proteins with differences in charge. The separation is based on the reversible interaction between a charged protein and an oppositely charged chromatographic medium.

#### Hydrophobic Interaction Chromatography (HIC)

HIC separates proteins with differences in hydrophobicity. The separation is based on the reversible interaction between a protein and the hydrophobic surface of the chromatographic medium.

#### Affinity Chromatography (AC)

AC separates proteins on the basis of a reversible interaction between a protein (or group of proteins) and a specific ligand attached to a chromatographic matrix.

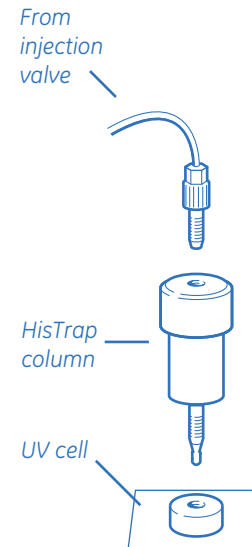
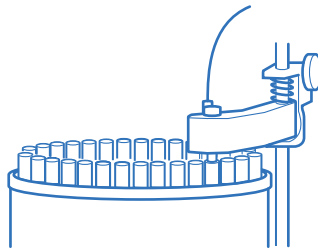


# Purification of histidine-tagged proteins

Here is an example on how to use an application template for purification of histidine-tagged proteins.

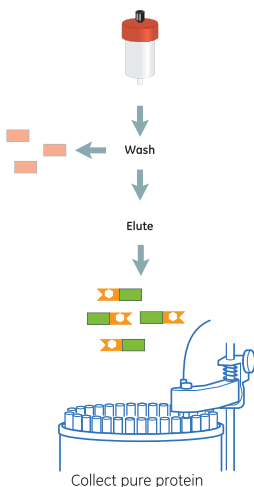
## 1.

The purification set-up includes buffer and sample preparation, connecting the prepacked HisTrap column to the system, and filling the fraction collector with tubes.



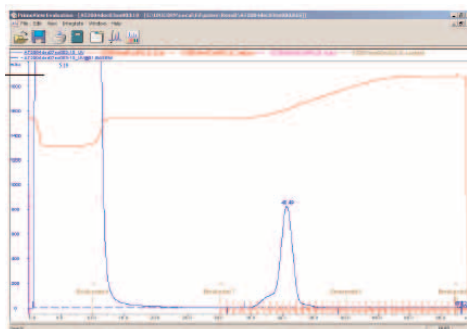
## 4.

The whole purification procedure is then run automatically.



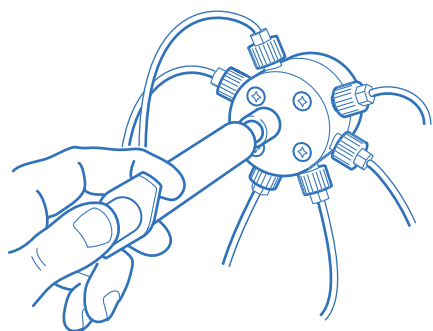
## 5a.

During the run, you get a real-time view. You don't have to take a sample to the spectrophotometer. You can instantly see where your purified protein is.



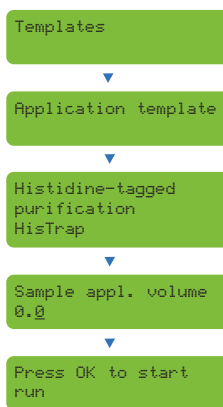
# 2.

Next you fill the sample injection loop with the sample.



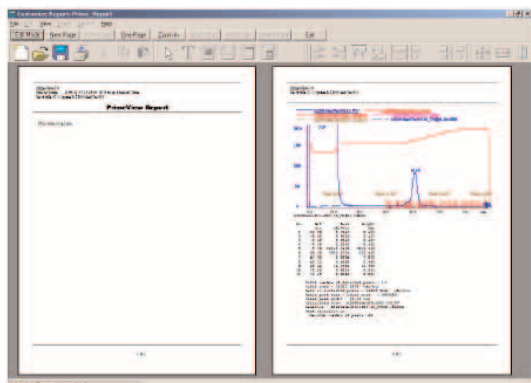
# 3.

Then select the correct application template, program the sample volume and press start.



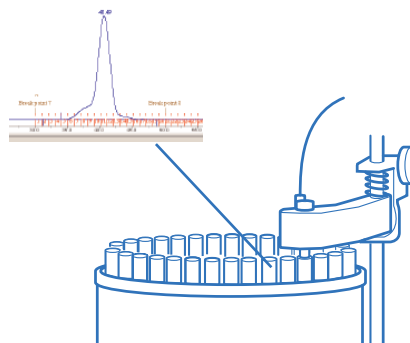
# 5b.

When finished, evaluate and generate your report. Review your target protein.



# 6.

Pick up your protein.





# Designed around your scientific needs

## **Up and running in no time**

It couldn't be simpler to get going with ÄKTAprime plus. The system is fast and easy to set up, and everything you need to know is programmed in.

An instructional video is included, which guides you through every aspect of the system. Cue cards are also supplied – handy reference cards that take you through many applications step by step.

## **Protein purification has never been more straightforward**

ÄKTAprime plus incorporates all the components you need for robust protein purification in a compact, convenient system that you can place wherever you want it. Now everything you need to do is in one place, and under full control.

The system is designed with optimized protocols and columns for common applications such as purification of histidine-tagged proteins. Optional PrimeView software facilitates monitoring, evaluation and data handling. Push-button operation makes it extremely easy to use.

## **Always in touch**

With ÄKTAprime plus, you're always in touch with your purification process. The PrimeView software shows you exactly what's happening throughout the run, thanks to real-time monitoring of UV and conductivity.

ÄKTAprime plus also features a clear and simple built-in display that lets you know at a glance the status of the purification process.

Documentation is easy as result files contain a complete record of a run, including method, curve data and run log. And if you want a customized report, it's produced for you in no time. Should you prefer to use the system without a computer, you can get a short display of data during the run with a Chart Recorder.

## **Your protein delivered with no fuss**

ÄKTAprime plus handles fractionation automatically for you. The fraction collector holds 95 tubes of 18 mm. Your protein is delivered straight to the tubes, ready for you to pick up. Fraction marks and numbers make it easy to identify fractions and peaks.

## **Engineered for peak performance**

The system pump gives precise delivery of liquid over a flow and pressure range that is optimal for the supported columns and media. To achieve higher purity in affinity purifications or when ion exchange or HIC protocols are used, built-in motorized switch valves enable accurate gradient formation.

The built-in online UV monitor lets you measure absorbance at 254 or 280 nm, so you never have to take your protein sample to the spectrophotometer.

The conductivity monitor displays the salt content of the sample and gradient formation data so you don't have to measure them afterwards. An optional pH monitor is also available.



# ÄKTAprime plus



# Sample results using application templates

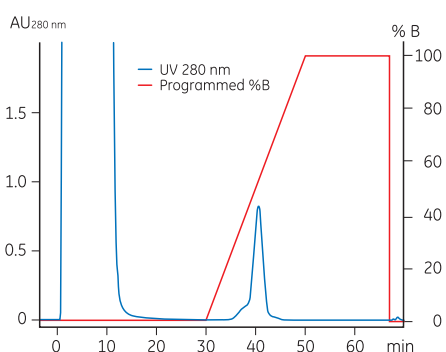
Pre-programmed methods with optimized protocols for defined columns turn purification steps into routine push-button procedures. This results in reproducible high protein purity and yield.



## Histidine-tagged protein purification – gradient elution

Using HiTrap column, prepacked with Ni Sepharose™ HP.

Ni Sepharose, delivered in prepacked HiTrap columns, ensures a high binding capacity for proteins, at least 40 mg/ml. Leakage of Ni<sup>2+</sup> ions is also negligible. The medium is compatible with a wide range of additives commonly used in the purification of histidine-tagged proteins.



Sample: Clarified homogenate of E. Coli expressing histidine-tagged protein  
 Column: HiTrap HP 1 ml  
 Binding buffer (port A1): 20 mM phosphate, 0.5 M NaCl, 20 mM imidazole, pH 7.4  
 Elution buffer (port B): 20 mM phosphate, 0.5 M NaCl, 0.5 M imidazole, pH 7.4

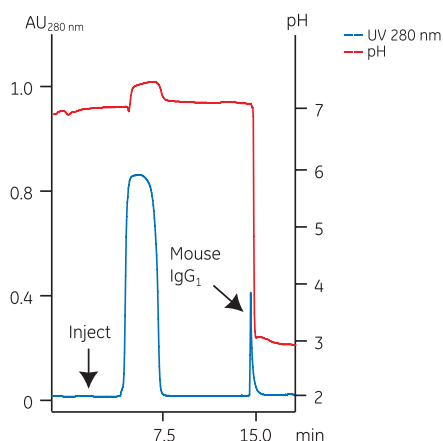
### Column list

HiTrap HP	5 x 1 ml 17-5247-01
HiTrap FF	5 x 1 ml 17-5319-01
HiTrap FF crude	5 x 1 ml 11-0004-58

## MAb purification – step elution

Using 1 ml HiTrap column, prepacked with Protein G HP.

While protein A and protein G affinity media are similar in many respects, their specificities for IgG differ. Protein G affinity media are the better choice for general purpose capture of antibodies, since they bind IgG from a broader range of eukaryotic species and bind more subclasses of IgG.



Sample: Cell culture supernatant containing mouse IgG<sub>1</sub>  
 Column: HiTrap Protein G HP 1 ml  
 Binding buffer (A1): 20 mM sodium phosphate, pH 7.0  
 Elution buffer (B): 0.1 M glycine-HCl, pH 3.0

### Column list

HiTrap Protein G HP	2 x 1 ml 17-0404-03
HiTrap Protein A HP	2 x 1 ml 17-0402-03
HiTrap rProtein A FF	2 x 1 ml 17-5079-02

# Data and ordering information

## System specifications and operating data

### ÄKTAprime plus

Size	400 x 450 x 530 mm (W x D x H)
Weight	13 kg
Solvent compatibility	All aqueous buffers commonly used in chromatography of biomolecules

### Pump

Flow rate range	0.1–50 ml/min
Increment	0.1 ml/min
Pressure range	0–1 MPa (10 bar, 145 psi)
Pressure limits	Programmable upper limit
Viscosity	Up to 10 cP

### Monitor

Absorbance range	0.01–5 AU (full scale)
Wavelengths with Hg lamp (using filter selection)	254 , 280 nm (supplied) 313, 405, 436, 546 nm (optional)
with Zn lamp	214 nm
Linearity	<3% up to 2 AU at 254 nm <5% up to 1 AU at 280 nm
Noise	$\leq 40 \times 10^{-6}$ AU
Drift	$\leq 100 \times 10^{-4}$ AU
Maximum pressure	4 MPa (40 bar, 580 psi)
Flow rate	0–100 ml/min
Optical path length	2 mm

### Conductivity measurement

Conductivity range	1 $\mu$ S/cm–999.9 mS/cm (IEX and HIC gradients)
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### pH measurement (optional)

pH range	0–14 (specifications valid between 2–12)
Accuracy	$\pm 0.1$ pH unit, temperature compensated
Stability maximum	0.1 pH units deviation/10 h

### Fraction collector

#### (with flow diversion valve PSV-50)

Tube capacity	95 in Tube Rack 18 mm (supplied) 175 in Tube Rack 12 mm (optional) 40 in Tube Rack 30 mm (optional)
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### Environment

Ambient temperature	+4 – +40 °C
Relative humidity	10–95% relative humidity
Atmospheric pressure	84–106 kPa (840–1060 mbar)

## Ordering information

### ÄKTAprime plus

	Code No.
ÄKTAprime plus excl. recorder	11-0013-13
ÄKTAprime plus incl. recorder	11-0013-12

### PrimeView

PrimeView	11-0003-59
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### Optional accessories

#### Alternative wavelengths for detection

Filter 313 nm	18-0623-01
Filter 365 nm	18-0624-01
Filter 405 nm	18-0625-01
Filter 436 nm	18-0626-01
Filter 546 nm	18-0627-01
Zn optics with 214 nm filter	18-1128-21

#### On-line pH monitoring

pH electrode with flow cell and flow cell holder	18-1134-84
Tubing 0.75 mm i.d.	18-1112-53

#### Column Holders

Long column holder	18-1126-32
Short column holder	18-1113-17

#### Sample application

Superloop 10 ml (ÄKTAdesign), load 1–10 ml	18-1113-81
Superloop 50 ml (ÄKTAdesign), load 1–50 ml	18-1113-82
Superloop 150 ml, load 1–150 ml	18-1023-85
Requires union 1/16Ç female – M6 male fitting, code no.	18-1112-57

#### Related product literature

Convenient Protein Purification, HiTrap Column Guide	18-1128-81
ÄKTAFPLC™	18-1128-41
ÄKTApurifier™	18-1119-48
ÄKTExplorer™ Systems	18-1124-09
Gel Filtration Columns and Media Selection Guide	18-1124-19
Ion Exchange Columns and Media Selection Guide	18-1127-31
Affinity Columns and Media Product Profile	18-1121-86

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[www.gehealthcare.com](http://www.gehealthcare.com)

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