

ÄKTAmicro™

ÄKTAmicro chromatography system (Fig 1) is designed for microscale liquid chromatography applications. Reliable, high-resolution purification of target molecules is achieved from extremely small amounts of starting material and from molecules as diverse as intact proteins, protein complexes, and nucleotides. Moreover, ÄKTAmicro is an excellent choice for characterization of target molecules and for rapid purity/recovery analysis in method development and drug discovery applications. The system is built on the proven ÄKTA™ design platform and is controlled by UNICORN™ software.

ÄKTAmicro chromatography system offers:

- High-performance purification and characterization using microbore to analytical scale columns, all controlled by UNICORN software
- High sample recovery and stability as the complete flowpath is manufactured from inert and biocompatible materials
- Optimized resolution by connection of columns directly to the UV cell and by minimized dead volumes in the tubing, valve, and flow cells
- Novel pump design for flexible flow and pressure range enabling high- as well as low-pressure separations
- Fast and reproducible purity analysis by gel filtration in method development and drug target characterization
- Absolute characterization of biomolecules in solution and on-line molecular weight analysis by the addition of light scattering equipment

Modular design based on the proven ÄKTA design platform

ÄKTAmicro is modular by design and is comprised of three main components: Pump P-905, Monitor pH/C-900, and Monitor UV-900. Autosampler A-905 and Fraction Collector Frac-950 are optional components. The system is based on the proven ÄKTA chromatography platform and is optimized for microbore-, narrowbore-, and analytical-scale purification of proteins and peptides (Table 1). In combination with



Fig 1. ÄKTAmicro chromatography system allows purification of extremely small sample volumes and is an excellent tool for rapid purity analysis in method development and drug target characterization.

Fraction Collector Frac-950, ÄKTAmicro offers microliter-scale fraction volumes and excellent chromatographic performance. Autosampler A-905 provides reliable and reproducible sample injection and unattended, multiple sample runs.

Table 1. Column diameter scales suitable for use with ÄKTAmicro system

Purification scale	Column i.d. (mm)
Microbore	1.0
Narrowbore	2.1
Analytical scale	4.6



Column: Superdex 200 PC 3.2/30
Sample: Monoclonal IgG4, fractions from purification step using MabSelect SuRe affinity chromatography medium
Elution buffer: Phosphate Buffered Saline (PBS)
Flow rate: 0.04 ml/min
Fraction size: 40 μ l
Detection: UV 280 nm
System: ÄKTAmicro

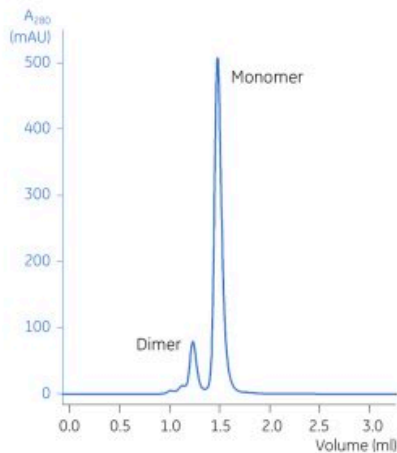


Fig 11. Purity analysis of IgG4 on Superdex 200 PC 3.2/30 gel filtration column and ÄKTAmicro system. The purity analysis was performed after initial affinity purification on a column packed with MabSelect SuRe™ chromatography medium.

Column: Mono Q PC 1.6/5
Sample: Total protein extract from immortalized lymphatic endothelial cells left untreated (controls) or treated with growth factors VEGF-A or VEGF-C
Buffer A: 20 mM Tris-HCl, 8 M urea, 6% isopropanol, pH 8.0
Buffer B: Buffer A + 1 M NaCl
Flow rate: 0.2 ml/min
Gradient: Linear salt gradient, 0% to 50% B
Detection: UV 215 nm
System: ÄKTAmicro

VEGF-A

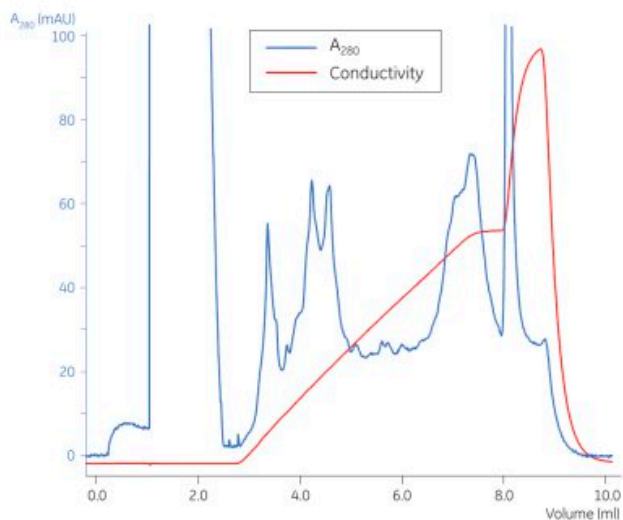


Fig 12. Chromatograms resulting from strong anion exchange chromatography of total protein extracts prepared from VEGF-A treated cells using Mono Q PC 1.6/5 on ÄKTAmicro system. Data for prefractionation of control and VEGF-C treated cells are not shown. Fractions of 0.4 ml were collected throughout the separations.

Specifications

System specifications

Flow rate range	0.001 to 2 ml/min
Pressure range	0 to 35 MPa
Conductivity range	1 μ S/cm to 999.9 mS/cm
pH range	2 to 12
Temperature range	4°C to 40°C
Solvent compatibility	All commonly used chromatographic solvents
Peak tubing dimension	0.15 mm i.d.
Dimensions (W x H x D)	480 x 450 x 610 mm
Weight	55 kg

Pump P-905

Flow rate range	0.001 to 2.0 ml/min
Isocratic mode	0.001 to 2.0 ml/min
Gradient mode	0.04 to 2.0 ml/min
During PumpWash	6 ml/min
Flow rate accuracy	0.2–35.0 MPa \pm 2%, or 2 μ l/min, whichever is greater with compression compensation activated
Flow rate reproducibility	> 0.04 ml/min, RSD < 0.5%
Increment	0.001 ml/min
Pressure range	0–35 MPa (350 bar, 5075 psi)
Pressure limits	Programmable upper and lower
Internal volume	< 600 μ l/pump module
Viscosity	maximum 3cP
Peak tubing dimension	0.15 mm i.d.
Dimensions (W x H x D)	480 x 450 x 610 mm
Weight	55 kg

Monitor UV-900

Wavelength range	190 to 700 nm in steps of 1 nm, three wavelengths simultaneously
Bandwidth	4 nm
Wavelength accuracy	\pm 2 nm
Wavelength reproducibility	\pm 0.01 nm
Linearity	< 2% deviation up to 2 AU at 260 nm with uracil at pH 2
Noise ¹ at 230 nm	< 6 \times 10 ⁻⁵ AU, with 3 mm cell, H ₂ O at 1 ml/min
Drift ¹ at 254 nm	< 2 \times 10 ⁻⁴ AU/h
Flow cell	
Maximum flow rate	2 ml/min
Maximum pressure	2 MPa (20 bar, 290 psi)
Path length	3 mm
Internal volume	0.7 μ l

¹ Typical values at room temperature after warm-up

Monitor pH/C-900

Conductivity unit

Conductivity range	1 $\mu\text{S}/\text{cm}$ to 999.9 mS/cm
Deviation from theoretical conductivity	Maximum $\pm 2\%$ of full-scale calibration range or $\pm 10 \mu\text{S}/\text{cm}$, whichever is greater in range
Noise	Maximum $\pm 0.5\%$ of full-scale calibration range

Flow cell

Maximum flow rate	2 ml/min
Maximum pressure	5 MPa (50 bar, 725 psi)
Internal volume	0.2 μl

Autosampler A-905

Sample capacity	Plate with 48 wells for standard, 1.5 ml vials Low plate with 96 wells High plate with 96 wells Low plate with 384 wells
Injection volume range	
Flushed loop	20 or 100 μl loop volume
Partial loop	1% to 50% of loop volume
Microliter pick-up	
20 μl loop	0.1 to 2.5 μl in 0.1 μl increments
100 μl loop	0.1 to 42.5 μl in 0.1 μl increments
Dispenser syringes	100 and 250 μl
Cooling specification	
Sample cooling	Built-in Peltier cooling processing unit
Programmable range	4°C to 40°C
Dimensions (W x H x D)	280 x 440 x 400 mm
Cooling capacity	Max. 12°C below ambient temperature for working temperatures between 16°C and 40°C

Accessories for Autosampler A-905¹

Syringe, 1 ml	18-1120-37
Peek loop, 1 ml	18-1114-01
Peek sample needle	18-1119-99
Buffer tubing, 2 ml	18-1120-31

¹ To support larger injection volumes than A-905 standard

Fraction Collector Frac-950

Flow rate range	0.001 to 100 ml/min
pH stability range	1 to 3, 1 to 14 (< 1 day exposure)
Fraction size ¹	
Volume mode	0.04 to 99999.99 ml
Time mode	0.04 to 99999.99 ml
No spillage range	
Dropsync. range	0 to 3 ml/min
Accumulator range	15 to 100 ml/min

¹ From 40 μl using Microfraction Collection Kit

Accessories for Frac-950

Microfraction Collection Kit	28-9487-80
Rack A ¹ (120 x 18 and 8 x 30 mm tubes)	18-6083-11
Rack B (240 x 12 mm tubes), supports Eppendorf tubes	18-6083-12
Rack C (4 x microtiter plates and 8 x 30 mm tubes)	18-6083-13
Microplate, 96-well (100 pieces)	18-1150-42

¹ Delivered with Frac-950 as standard

Ordering information

System and components	Code no.
ÄKTAmicro system	28-9483-03
includes ÄKTAmicro, software, and installation accessories	
Autosampler A-905 for ÄKTAmicro	18-5050-65
Autosampler A-900 with cooling	18-1144-61
Fraction Collector Frac-950	18-6083-00
UNICORN v5.20	28-9432-44
UNICORN Analysis Module, v5.0	18-1134-74
Special strategy for ÄKTAmicro (for use with one additional valve and/or external equipment)	18-1162-83
A/D converter AD-900	18-1148-62
Valve INV 917	18-1147-23

Column holders

Short column holder	18-3094-60
Long column holder	18-1126-32
Small column clamp	18-1149-98
ÄKTA extension equipment holder	18-1158-31

Columns

Columns	Code no.
$\mu\text{RPC C2/C18 ST 4.6/100}$	17-5057-01
SOURCE™ 5RPC ST 4.6/150	17-5116-01
SOURCE 15RPC ST 4.6/100	17-5068-01
RESOURCE™ RPC (1 ml)	17-1181-01
RESOURCE RPC (3 ml)	17-1182-01
Mini Q™ PC 3.2/3	17-0686-01
Mini Q 4.6/50 PE	17-5177-01
Mini S™ PC 3.2/3	17-0687-01
Mini S 4.6/50 PE	17-5178-01
Mono Q PC 1.6/5	17-0671-01
Mono Q 5/50 GL	17-5166-01
Mono S™ PC 1.6/5	17-0672-01
Mono S 5/50 GL	17-5168-01
Superose™ 6 PC 3.2/30	17-0673-01
Superose 12 PC 3.2/30	17-0674-01
Superdex Peptide PC 3.2/30	17-1458-01
Superdex 75 PC 3.2/30	17-0771-01
Superdex 200 PC 3.2/30	17-1089-01
Superdex 75 5/150 GL	28-9205-04
Superdex 200 5/150 GL	28-9065-61