

YMC
EUROPE GMBH



YMC-BioPro



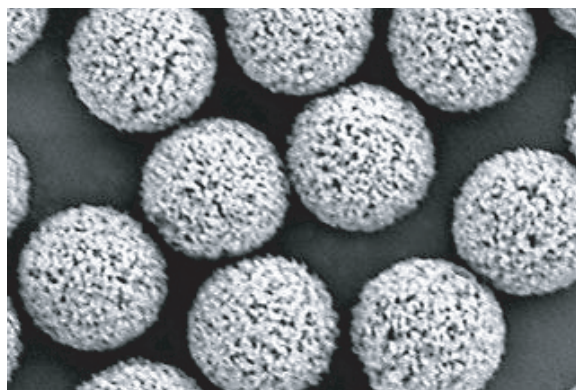
porous and nonporous IEX columns

*For the analysis and separation
of peptides, proteins and biomolecules*



YMC-BioPro

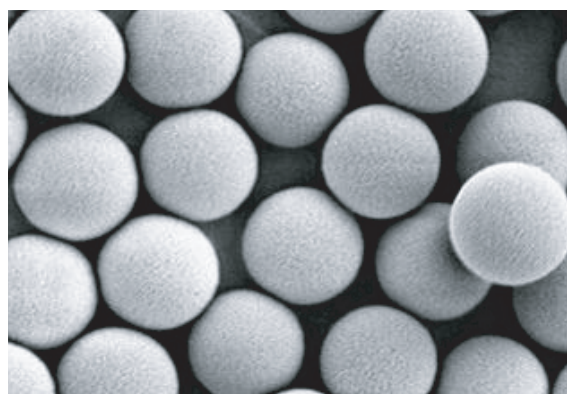
For the analysis and separation of peptides, proteins and biomolecules



Porous polymer beads

YMC-BioPro QA / YMC-BioPro SP

Pore size / nm: 100
Particle size / μm : 5
Charged group: $-\text{CH}_2\text{N}^+(\text{CH}_3)_3$ / $-\text{CH}_2\text{CH}_2\text{CH}_2\text{SO}_3^-$
Counter ion: Cl^- / Na^+
pH range: 2.0 - 12.0

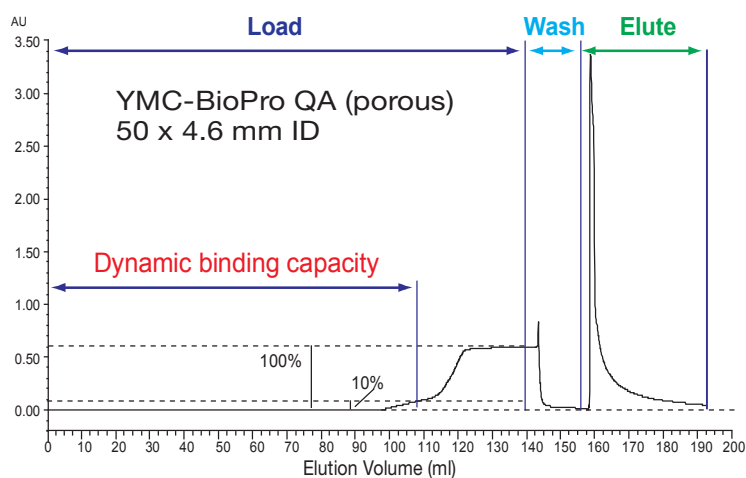


Nonporous polymer beads

YMC-BioPro QA-F / YMC-BioPro SP-F

Pore size / nm: nonporous
Particle size / μm : 5
Charged group: $-\text{CH}_2\text{N}^+(\text{CH}_3)_3$ / $-\text{CH}_2\text{CH}_2\text{CH}_2\text{SO}_3^-$
Counter ion: Cl^- / Na^+
pH range: 2.0 - 12.0

Determination of DBC*



Before determination, equilibrate the column with equilibration buffer.

Step 1: Load

A protein solution of known concentration is continuously loaded at the desired flow rate and the absorbance of the eluate is monitored until full saturation is achieved (100% UV absorbance of the pure sample solutions).

Step 2: Wash

Wash the column with equilibration buffer until no more protein elutes (0% UV absorbance)

Step 3: Elute

The DBC of the medium is a measure of the volume of protein solution that has been applied up to a specific breakthrough point (usually 5 or 10%).

YMC-BioPro

For the analysis and separation of peptides, proteins and biomolecules

High binding capacity and high recovery for porous type

The porous type of YMC-BioPro shows great capacity and excellent recovery, making it is useful for semi-preparative separations of proteins and antibodies

Comparison of dynamic binding capacity (DBC) for BSA

	Dynamic binding capacity (mg/ml-gel, 10% breakthrough)	Eluted amount (mg/ml-gel)	Recovery* (%)
YMC-BioPro QA	126	120	95
Mono Q (GE Healthcare)	100	35	35
BioAssist Q (Tosoh bioscience)	73	58	79

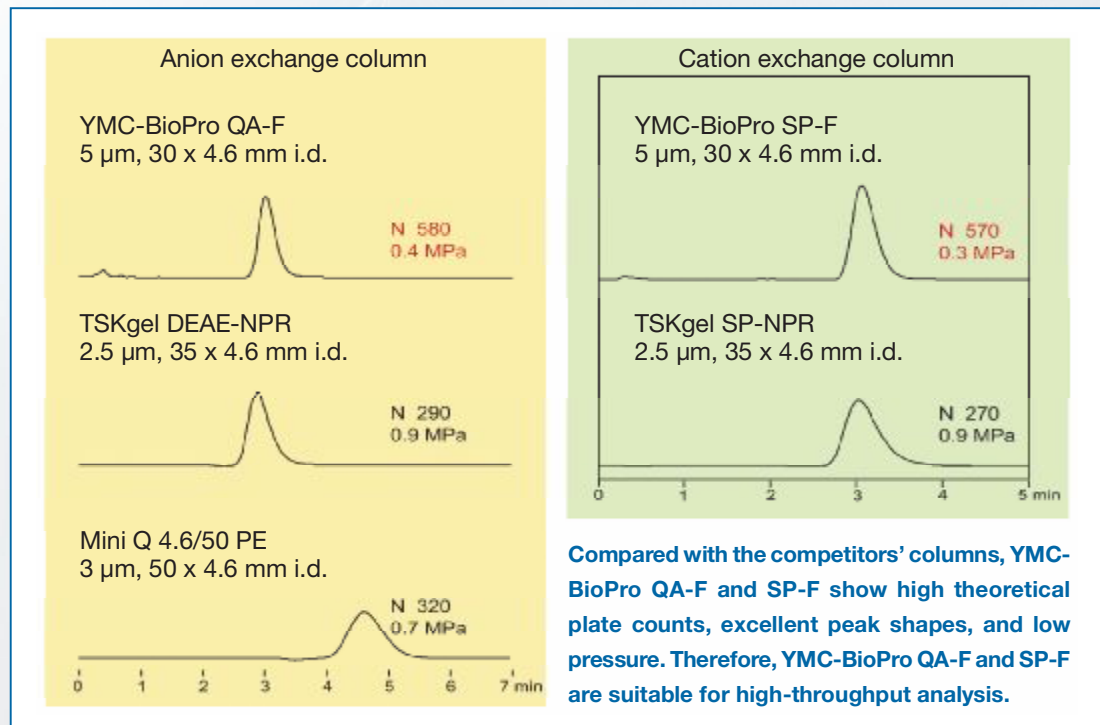
* Recovery: (Eluted amount/Dynamic binding capacity) x 100

Compared with conventional porous polymer anion exchange columns, YMC-BioPro QA gives higher DBC and recovery rates. This indicates that YMC-BioPro has a much lower nonspecific adsorption compared to conventional columns.

High recovery rates for YMC-BioPro

High efficiency with a lower column pressure with nonporous type

Comparison of column efficiency on non-porous polymer based columns*



Eluent: 20 mM Tris-HCl (pH 8.1) (for anion exchange columns)
20 mM KH_2PO_4 - K_2HPO_4 (pH 6.8) (for cation exchange columns)

Flow rate: 0.12 ml/min
Temperature: 25 $^\circ\text{C}$
Detection: UV at 220 nm
Injection: 20 μl
Sample: Formamide (2 $\mu\text{l}/\text{ml}$)

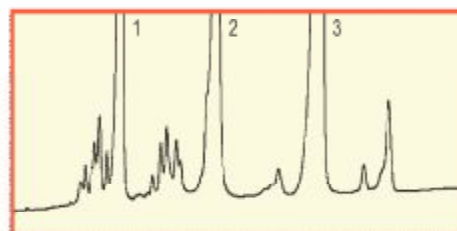
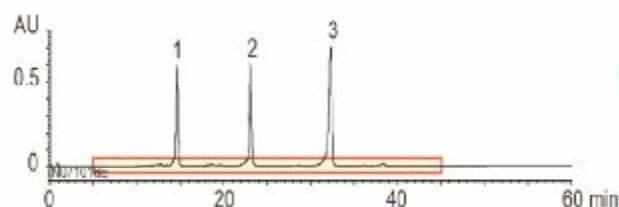
YMC-BioPro

For the analysis and separation of peptides, proteins and biomolecules

Excellent resolution

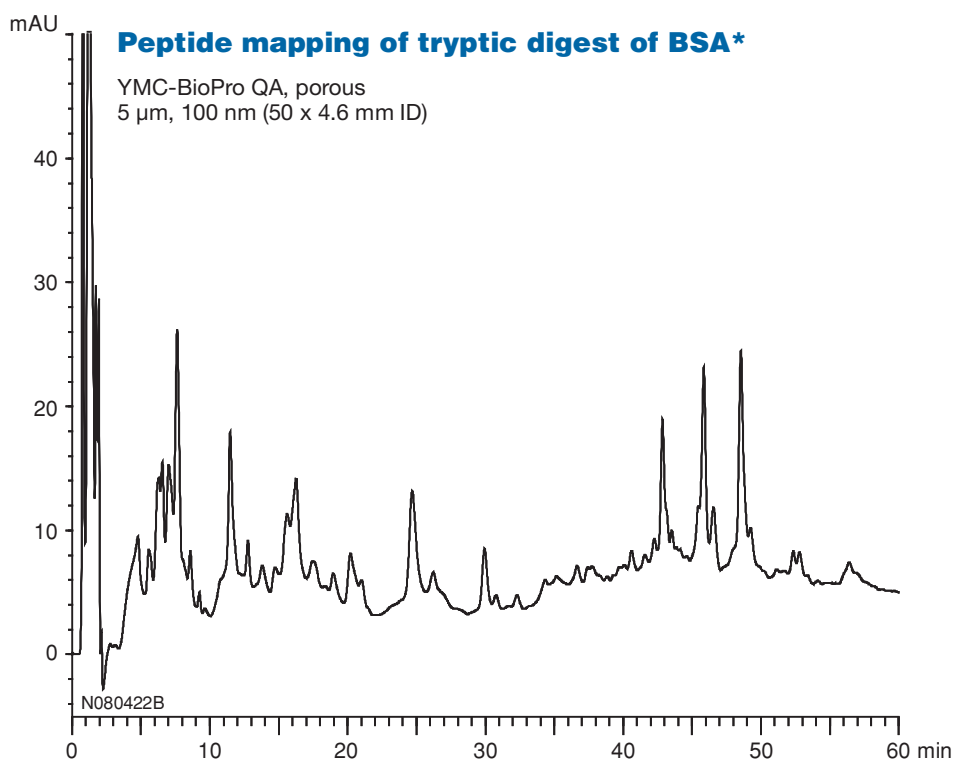
Standard protein separation on porous YMC-BioPro SP*

YMC-BioPro SP
5 μ m, 50 x 4.6 mm ID



Eluent: A) 20 mM KH_2PO_4 - K_2HPO_4 (pH 6.8)
B) 20 mM KH_2PO_4 - K_2HPO_4 (pH 6.8) containing 0.5M NaCl
0-100% B (0-60 min., linear)
Flow rate: 0.5 ml/min (4.6 mm ID column)
0.59 ml/min (5.0 mm ID column)
Temperature: 25 $^\circ\text{C}$
Detection: UV at 220 nm
Injection: 20 μ l (4.6 mm ID column)
23.6 μ l (5.0 mm ID column)

1. Cytochrome c (0.5 mg/ml)
2. Ribonuclease A (0.5 mg/ml)
3. Lysozyme (0.5 mg/ml)



Peptide mapping of tryptic digest of BSA*

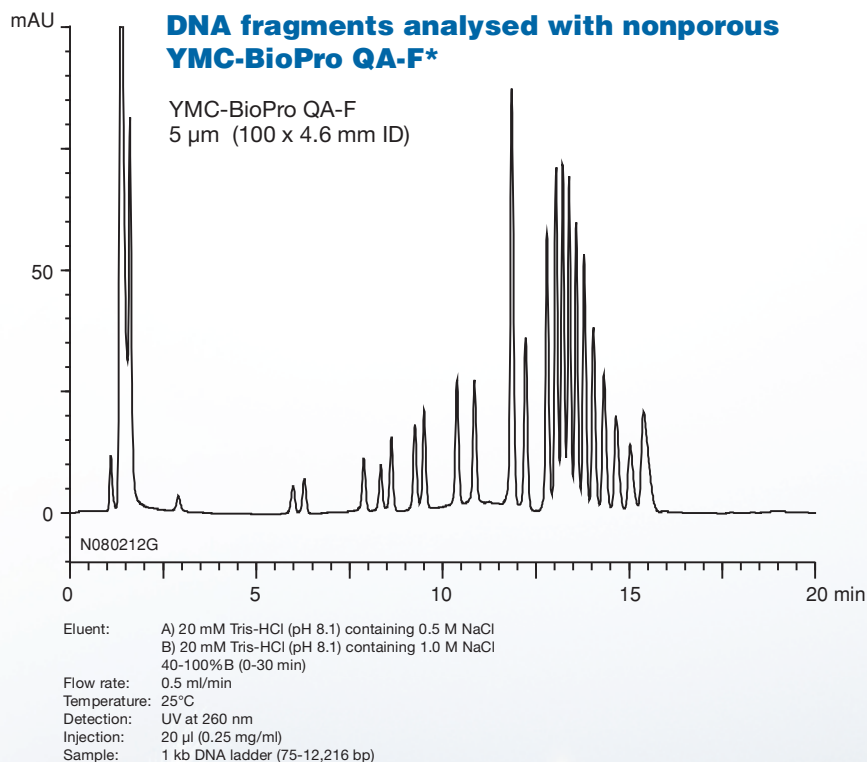
YMC-BioPro QA, porous
5 μ m, 100 nm (50 x 4.6 mm ID)

Eluent: A) 20 mM Tris-HCl (pH 8.6)
B) 20 mM Tris-HCl (pH 8.6) containing 0.5 M NaCl
0-15%B (0-30 min), 15-60%B (30-60 min)
Flow rate: 0.5 ml/min
Temperature: 25 $^\circ\text{C}$
Detection: UV at 220 nm
Injection: 20 μ l
Sample: Tryptic digest of BSA

YMC-BioPro

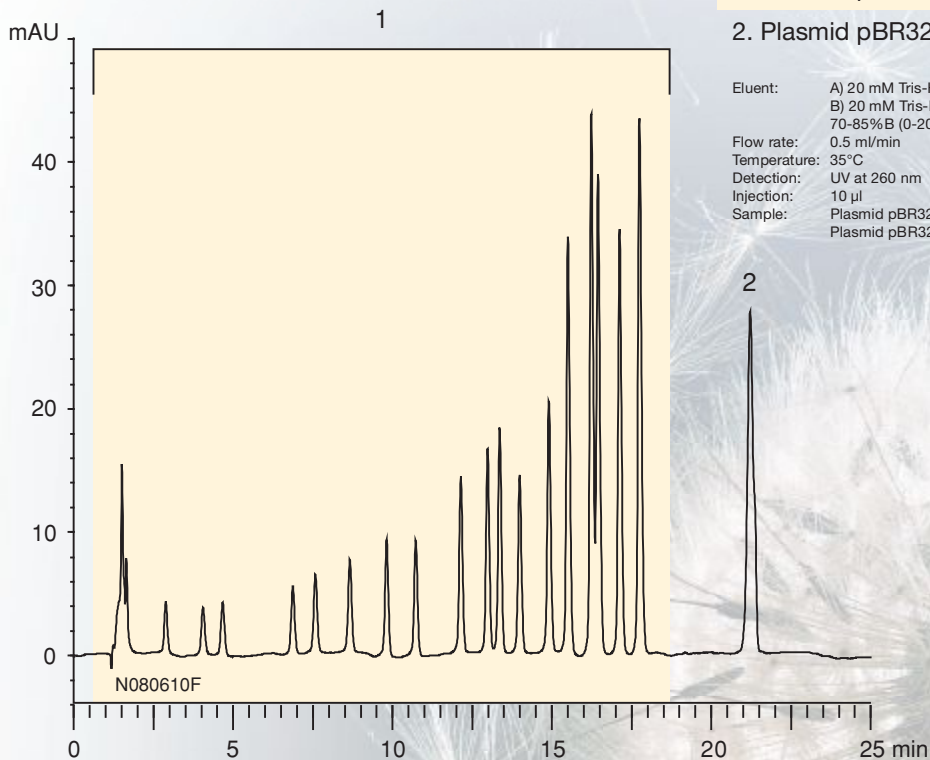
For the analysis and separation of peptides, proteins and biomolecules

High resolution!



Fast analysis on nonporous YMC-BioPro QA-F*

YMC-BioPro QA-F
5 μ m (100 x 4.6 mm ID)

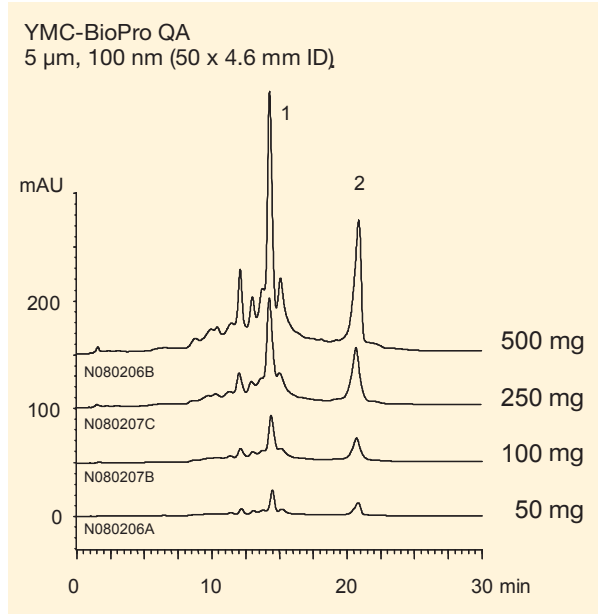


YMC-BioPro

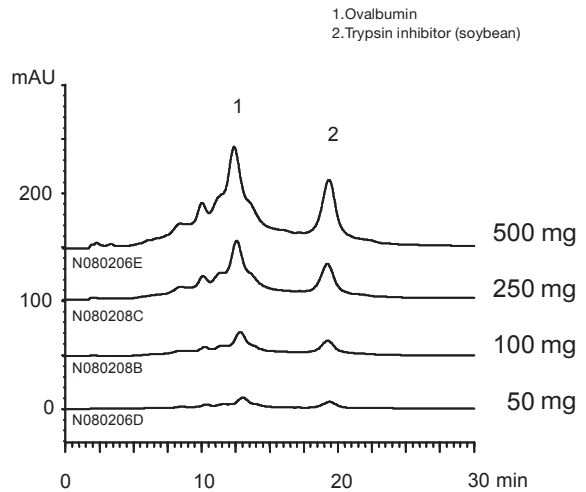
For the analysis and separation of peptides, proteins and biomolecules

Loading study for YMC-BioPro QA (porous)

Proteins*



GE Healthcare (Mono Q)
10 μ m (50 x 5.0 mm ID)



Eluent: A) 20 mM Tris-HCl (pH 8.1)
B) 20 mM Tris-HCl (pH 8.1) containing 0.5 M NaCl
10-80%B (0-30 min)

Flow rate: 0.5 ml/min

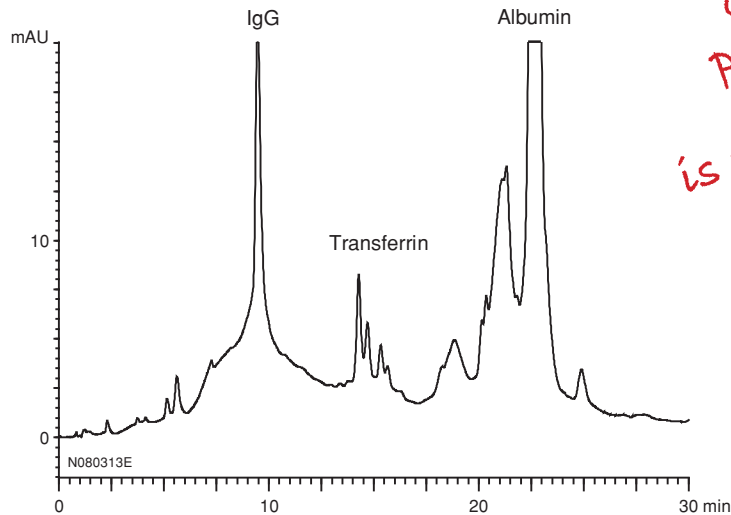
Temperature: 25°C

Detection: UV at 280 nm

Injection: 100 μ l

Proteins in human serum*

YMC-BioPro QA, porous
5 μ m, 100 nm (50 x 4.6 mm ID)



Eluent: A) 20 mM Tris-HCl (pH 8.6)
B) 20 mM Tris-HCl (pH 8.6) containing 0.5 M NaCl
0-30%B (0-15 min), 30-100%B (15-30 min)

Flow rate: 0.5 ml/min

Temperature: 25°C

Detection: UV at 280 nm

Injection: 20 μ l

Sample: Human serum (100 μ l/ml)

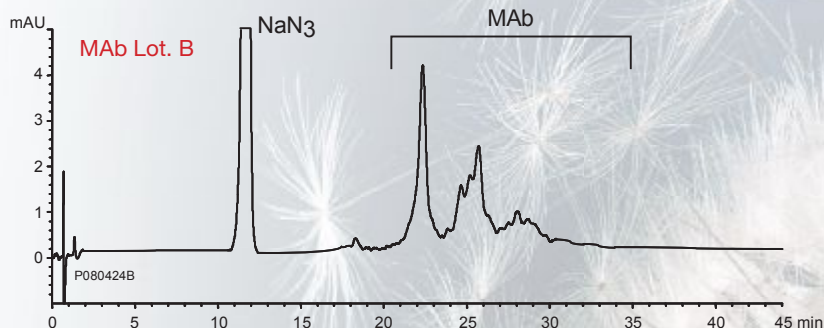
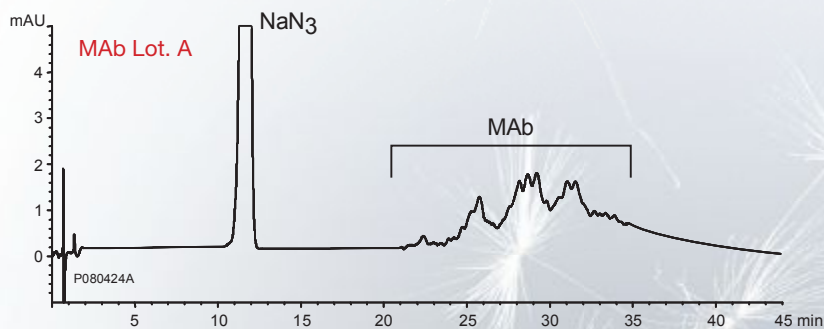
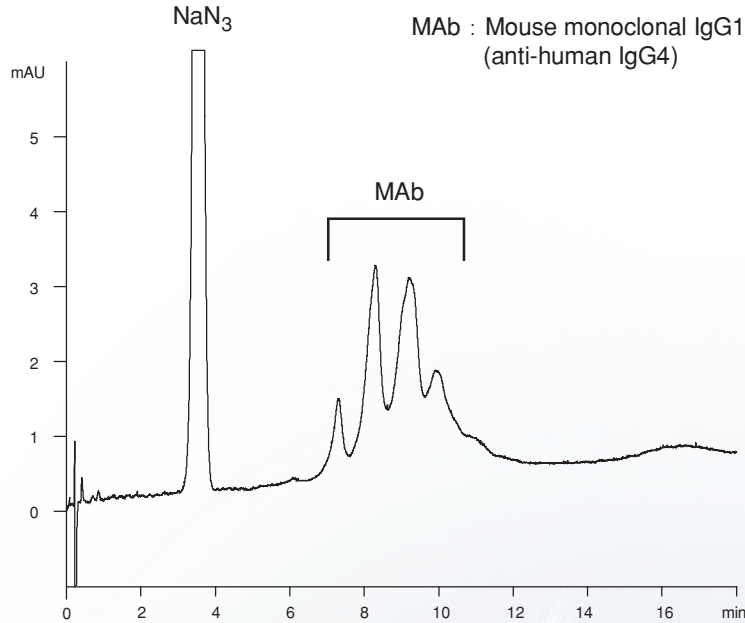
For high resolution
YMC-BioPro
QA/SP,
porous IEX
material,
is recommended!

YMC-BioPro

For the analysis and separation of peptides, proteins and biomolecules

Analysis of monoclonal antibody (MAb) against human IgG4*

YMC-BioPro QA-F, nonporous
5 µm, 100 x 4.6 mm ID



Eluent: A) 20 mM Tris-HCl (pH 8.1)
B) 20 mM Tris-HCl (pH 8.1) containing 0.5 M NaCl
Gradient: 10-25%B (0-60 min)
Flow rate: 1.0 ml/min
Temperature: 25 °C
Detection: UV at 220 nm
Injection: 14 µl
Sample: Monoclonal mouse IgG1 (0.1 mg/ml)
(Purified by DEAE chromatography, containing NaN₃)

Two different lots of commercially available MAb, purified by DEAE chromatography, are separated using a 100 mm length YMC-BioPro QA-F column.

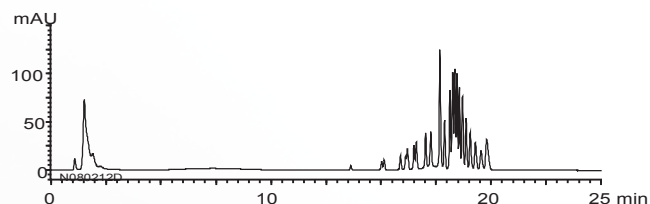
The MAb is resolved into several peaks and the MAb lot-to-lot variability is observed.

The 100 mm long columns in the YMC-BioPro non-porous series exhibit high efficiency and are ideal for characterisation or QC assessment of closely related proteins.

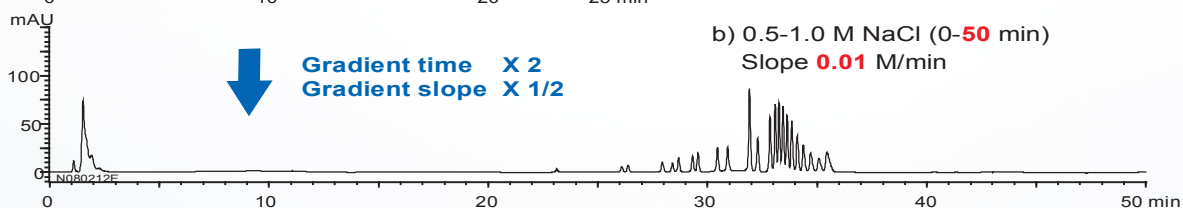
YMC-BioPro

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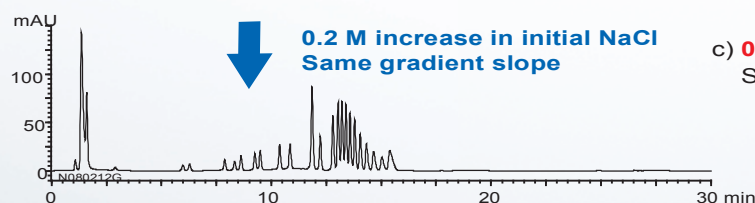
Application - Nucleotides -*



a) 0.5-1.0 M NaCl (0-25 min)
Slope 0.02 M/min



b) 0.5-1.0 M NaCl (0-50 min)
Slope 0.01 M/min



c) 0.7-1.0 M NaCl (0-30 min)
Slope 0.01 M/min

Elution of DNA fragments is optimised on 100 mm columns. The sensitivity is improved by reducing the gradient to half. In addition, the analysis time can be shortened by increasing the buffer concentration, while maintaining excellent resolution.

Column: YMC-BioPro QA-F, 5 μ m, 100 x 4.6 mm ID
Eluent: A) 20 mM Tris HCl (pH 8.1) containing 0.5 M NaCl
B) 20 mM Tris HCl (pH 8.1) containing 1.0 M NaCl
Flow rate: 0.5 ml/min
Temperature: 25 °C
Detection: UV at 260 nm
Injection: 20 μ l
Sample: 1 Kb DNA Ladder (0.25 mg/ml)

Ordering information for YMC-BioPro Series, 5 μ m

Column dimension (mm)	YMC-BioPro QA	YMC-BioPro SP	YMC-BioPro QA-F	YMC-BioPro SP-F
30 x 4.6	—	—	QF00S050346WP	SF00S050346WP
50 x 4.6	QAA0S050546WP	SPA0S050546WP	—	—
100 x 4.6	—	—	QF00S051046WP	SF00S051046WP

Other dimensions on demand

Preparative grade YMC-BioPro also available as bulk media!

Your local distributor:

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