

YMC
EUROPE GMBH



YMC-BioPro

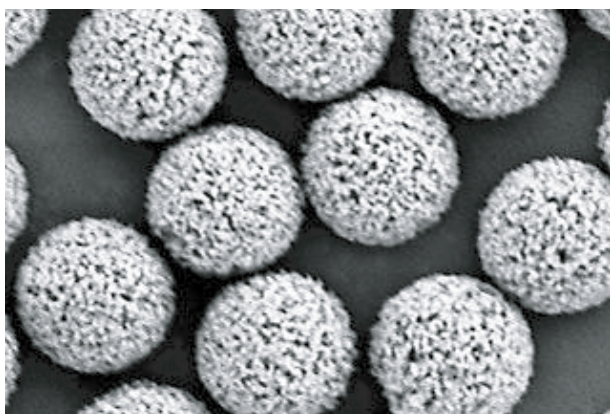
porous and nonporous IEX columns

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



YMC-BioPro

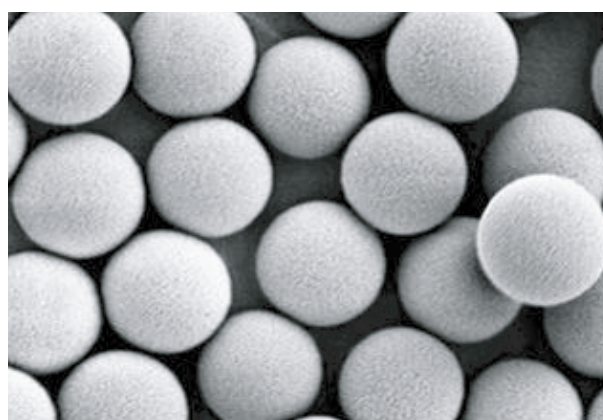
For the analysis and separation of peptides, proteins and biomolecules



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

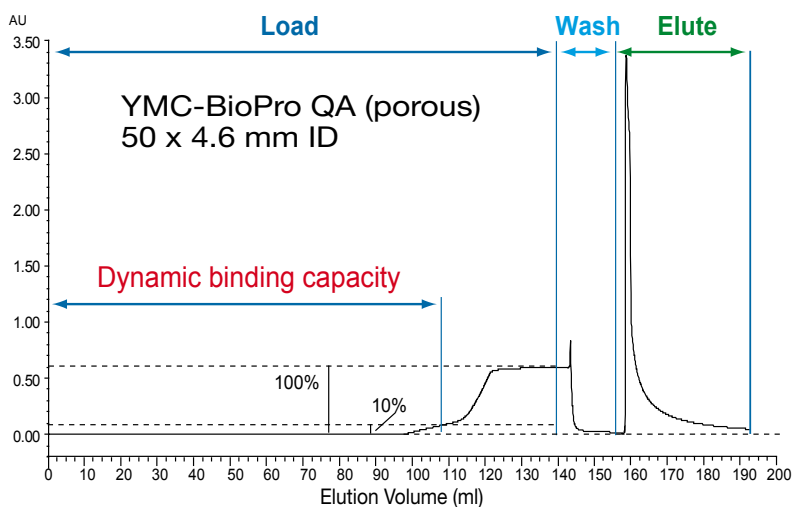


Nonporous polymer beads

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

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High binding capacity and high recovery for porous type

The porous type of YMC-BioPro shows great absorption 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 |

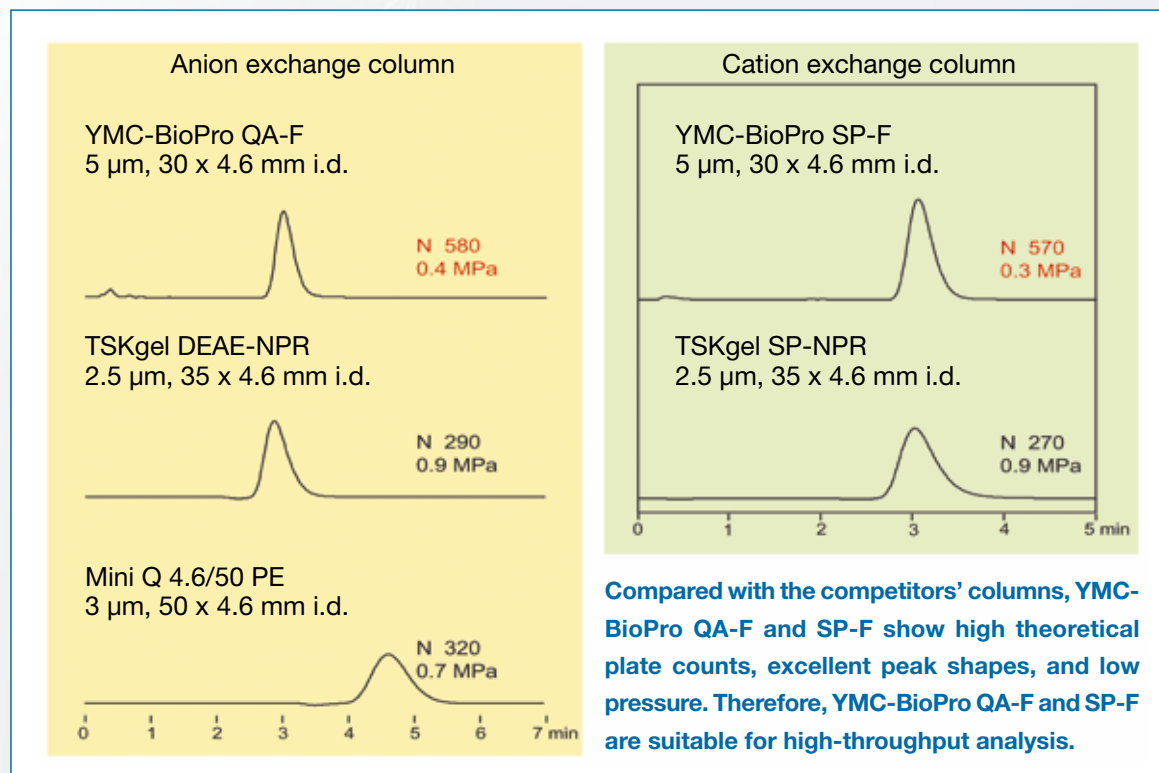
* Recovery: (Eluted amount/Dynamic binding capacity) x 100

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*



Compared with the competitors' columns, YMC-BioPro QA-F and SP-F show high theoretical plate counts, excellent peak shapes, and low pressure. Therefore, YMC-BioPro QA-F and SP-F are suitable for high-throughput analysis.

Eluent: 20 mM Tris-HCl (pH 8.1) (for anion exchange columns)
20 mM KH₂PO₄-K₂HPO₄ (pH 6.8) (for cation exchange columns)
Flow rate: 0.12 ml/min
Temperature: 25 °C
Detection: UV at 220 nm
Injection: 20 µl
Sample: Formamide (2 µl/ml)

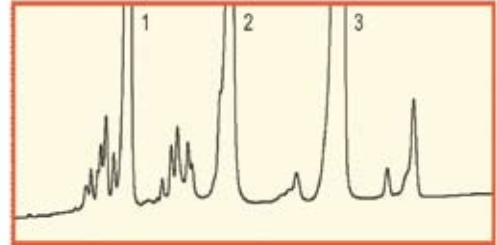
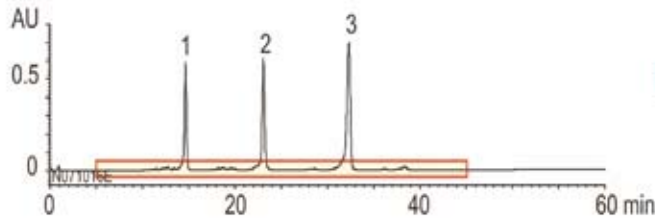
YMC-BioPro

For the analysis and separation of peptides, proteins and biomolecules

Excellent resolution

Standard protein separation on porous YMC-BioPro SP*

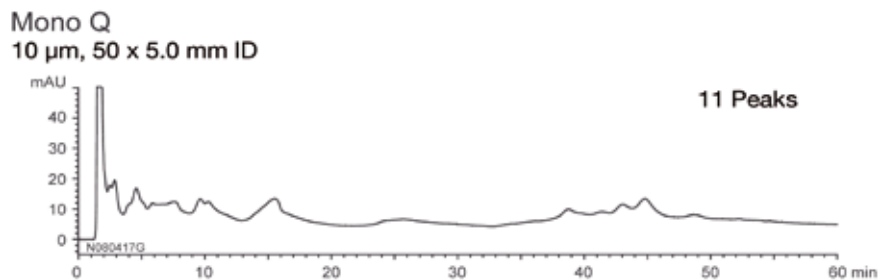
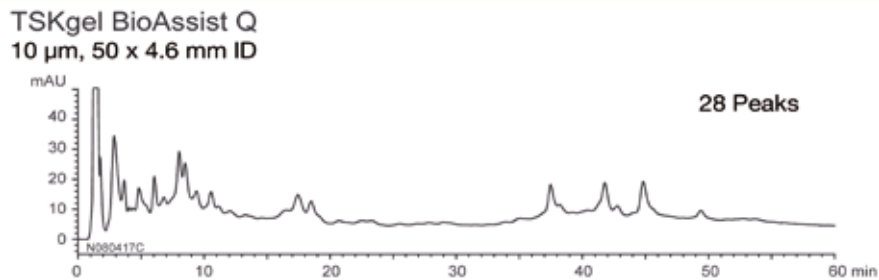
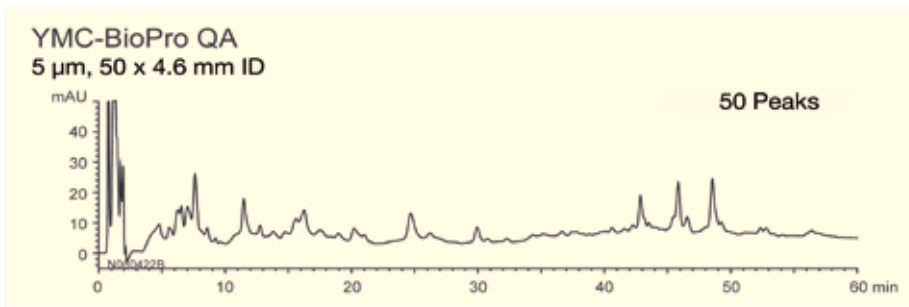
YMC-BioPro SP
5 μm , 50 x 4.6 mm ID



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 μl (4.6 mm ID column)
23.6 μl (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*



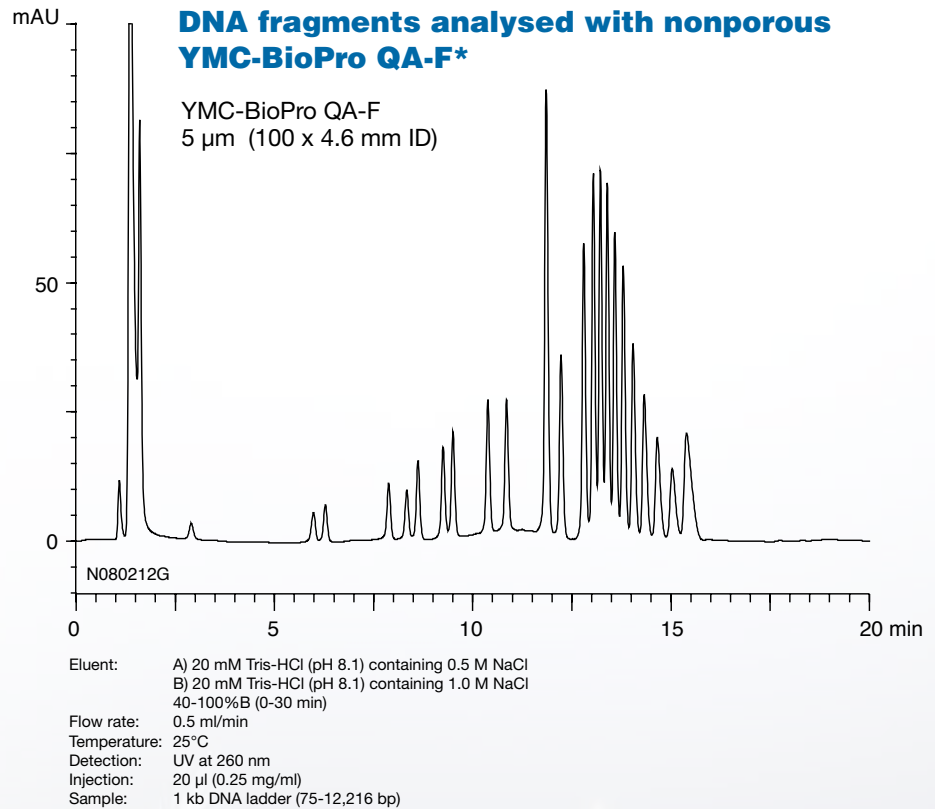
Eluent: A) 20 mM Tris-HCl (pH 8.6)
B) 20 mM Tris-HCl (pH 8.6) containing 0.5 M NaCl
0-15%B (0-30 min), 15-60%B (30-60 min)
Flow rate: 0.5 ml/min

Temperature: 25 $^\circ\text{C}$
Detection: UV at 220 nm
Injection: 20 μl
Sample: Tryptic digest of BSA

YMC-BioPro

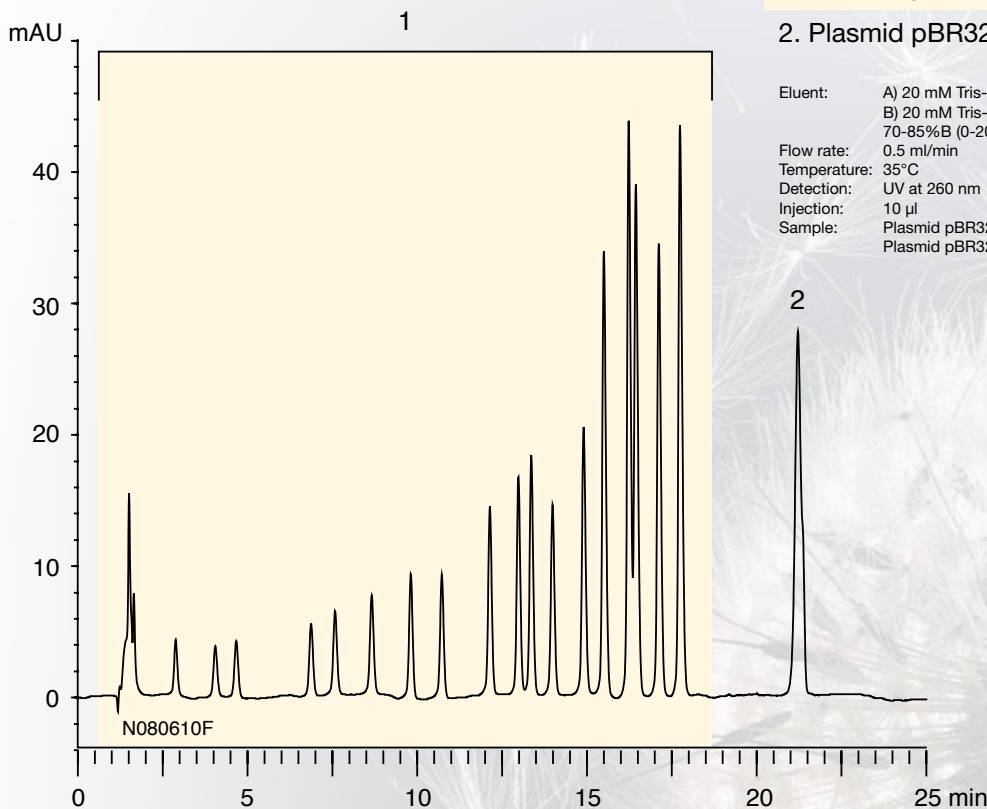
For the analysis and separation of peptides, proteins and biomolecules

High resolution!



Fast analysis on nonporous YMC-BioPro QA-F*

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



1. Plasmid pBR322 *Hae* III digest (8-587 bp)

2. Plasmid pBR322 (4,361 bp)

Eluent: A) 20 mM Tris-HCl (pH 8.1)
B) 20 mM Tris-HCl (pH 8.1) containing 1.0 M NaCl
70-85%B (0-20 min), 85%B (20-25 min)

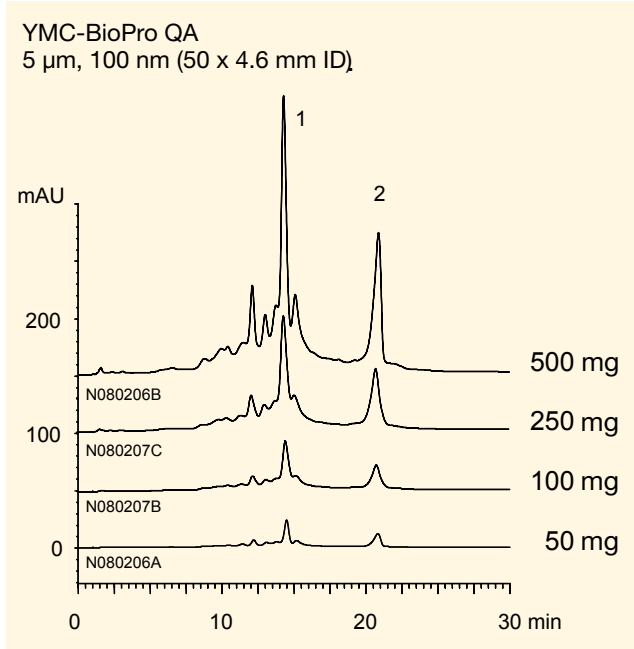
Flow rate: 0.5 ml/min
Temperature: 35°C
Detection: UV at 260 nm
Injection: 10 μ l
Sample: Plasmid pBR322 *Hae* III digest (0.13 mg/ml)
Plasmid pBR322 (0.03 mg/ml)

YMC-BioPro

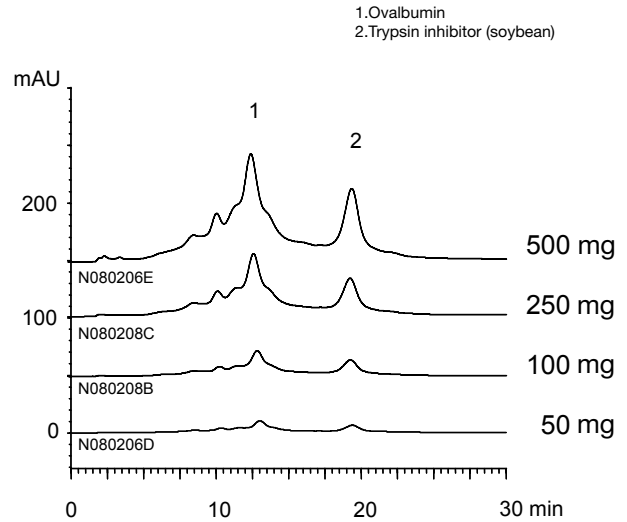
For the analysis and separation of peptides, proteins and biomolecules

Loading study for YMC-BioPro QA (porous)

Proteins*



GE Healthcare (Mono Q)
10 µm (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

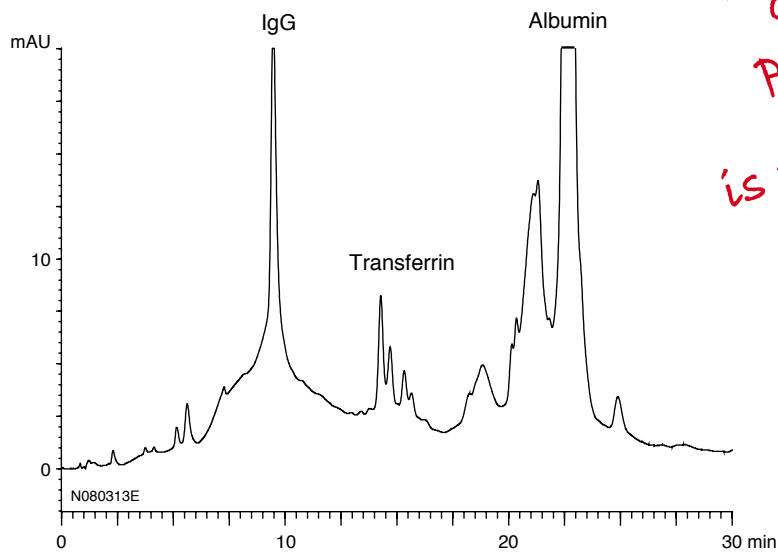
Temperature: 25°C

Detection: UV at 280 nm

Injection: 100 µl

Proteins in human serum*

YMC-BioPro QA, porous
5 µm, 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 µl

Sample: Human serum (100 µl/ml)

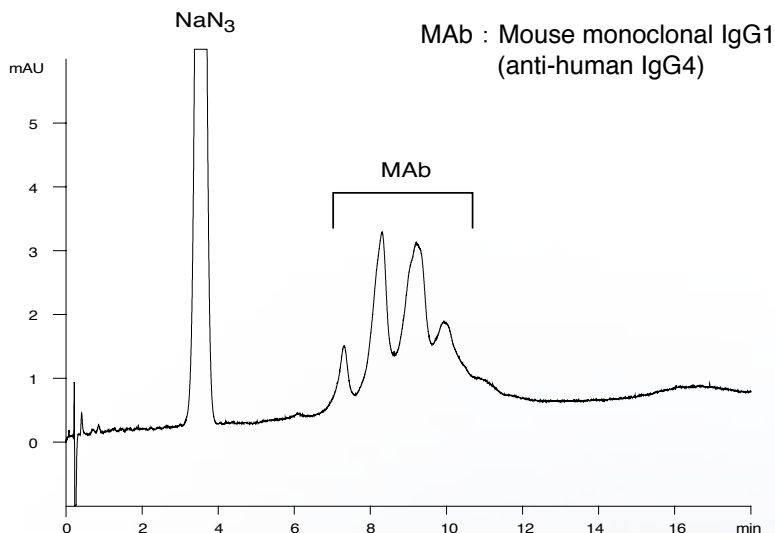
For high resolution
YMC-BioPro
QA/SP,
porous IEX
material,
is recommended!

YMC-BioPro

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Analysis of monoclonal antibody (MAb) against human IgG4*

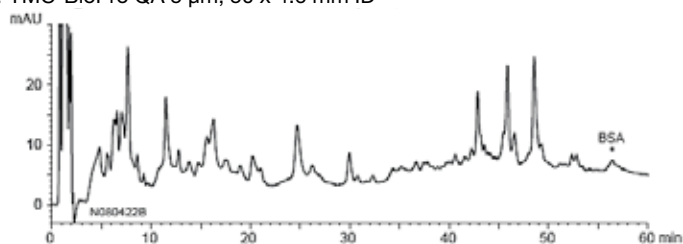
YMC-BioPro QA-F, nonporous
5 μ m, 100 x 4.6 mm ID



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 (0-18 min)
Flow rate: 1.0 ml/min
Temperature: 25 °C
Detection: UV at 220 nm
Injection: 10 μ l
Sample: Monoclonal mouse IgG1 (0.1 mg/ml)
(Purified by DEAE chromatography, containing NaN₃)

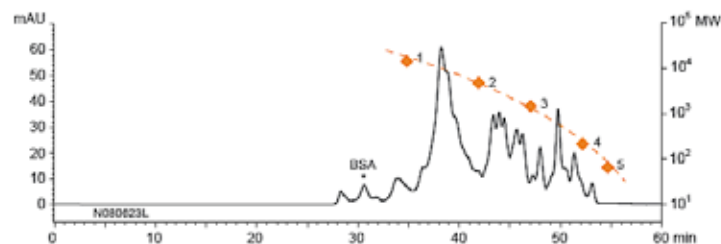
Peptidemapping

IEX: YMC-BioPro QA 5 μ m, 50 x 4.6 mm ID



Eluent: A) 20 mM Tris-HCl (pH 8.6)
B) 20 mM Tris-HCl (pH 8.6)
+ 0.5 M NaCl
0-15% B (0-30 min), 15-60% B (30-60 min)
Flow rate: 0.5 ml/min
Temperature: 25 °C
Detection: UV at 220 nm
Injection: 20 μ l

SEC: YMC-Pack Diol-120 x Diol-60 5 μ m, 500 x 8.0 mm ID x 2

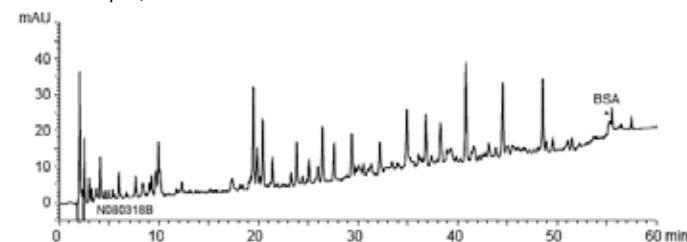


Calibration curve of proteins and peptides

1. Myoglobin (MW 17,000)
2. Insulin (Bovine) (MW 5,700)
3. Neurotensine (MW 1,672)
4. Tetraglyzine (MW 246)
5. Glyzine (MW 75)

Eluent: 0.1 M KH₂PO₄-K₂HPO₄ (pH 7.0)
+ 0.2 M NaCl/Acetonitril (70/30)
Flow rate: 0.7 ml/min
Temperature: 25 °C
Detection: UV at 220 nm
Injection: 5 μ l

RP: YMCbasic 5 μ m, 150 x 2.0 mm ID



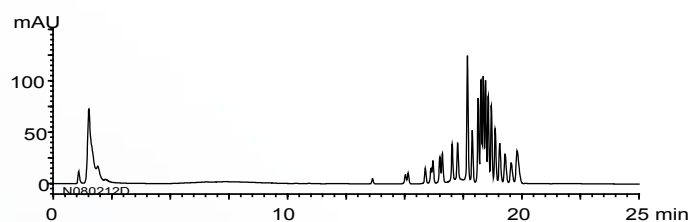
Eluent: A) Water/TFA (100/0.1)
B) Acetonitrile/TFA (100/0.1)
5-35% B (0-50 min), 35-45% B (50-55 min)
45% B (55-60 min)
Flow rate: 0.2 ml/min
Temperature: 37 °C
Detection: UV at 220 nm
Injection: 1 μ l

Tryptic digest of BSA (MW: 66,000)

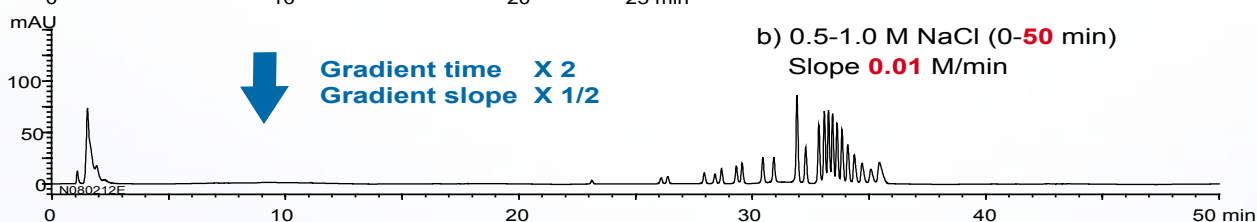
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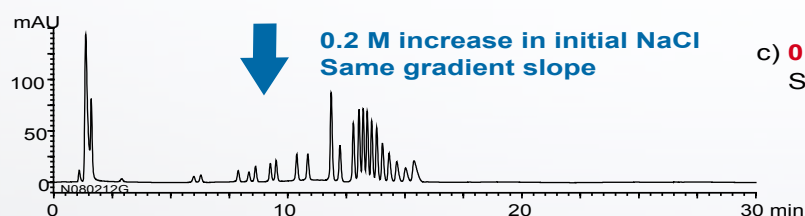
Application - Nucleotides -*



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 $^{\circ}$ 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!

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