

# TOYOPEARL GigaCap<sup>®</sup> CM-650M

The newly developed Toyopearl GigaCap<sup>®</sup> CM-650M is a high capacity cation exchange resin especially designed for:

- ❖ The purification of both high and low molecular weight proteins
- ❖ Capture and intermediate purification steps in high throughput process chromatography
- ❖ High binding capacities for a wide range of bio-molecules

Toyopearl is a methacrylic polymer incorporating high mechanical stability. Resins are available as non functionalized resins for SEC or derivatised with surface chemistries for alternative modes of chromatography such as IEC, HIC and AFC.

## Toyopearl GigaCap<sup>®</sup> CM-650M highlights

- ❖ Weak cation exchange resin (COO group)
- ❖ Excellent mechanical and chemical stability
- ❖ Typical dynamic binding capacity of 100 g/l for IgG

## GigaCap high capacity ion exchange resins

Ion exchange chromatography is a popular capture or intermediate purification step for recombinant proteins. The development of cell lines with high expression levels has triggered the demand for high throughput in downstream processing. Increasing throughput requires rigid resins with high binding capacities and recoveries at high flow rates.

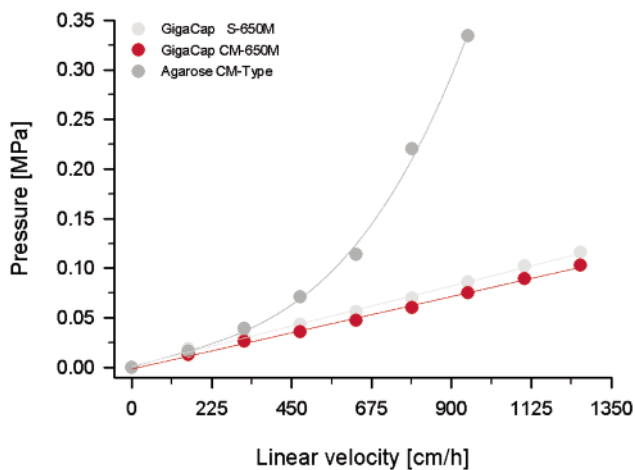
Toyopearl GigaCap CM-650M is the third product in the Toyopearl GigaCap series of high capacity ion exchange

resins, optimized for capture and intermediate biopurification steps.

Toyopearl GigaCap CM-650M is a weak cation exchange resin, developed to meet the actual needs in purification of biopharmaceuticals by packed bed chromatography. It complements the strong cation exchanger Toyopearl GigaCap S-650M and the strong anion exchanger GigaCap Q-650M.

Toyopearl GigaCap resins are based on the well proven methacrylic polymer backbone of Toyopearl and TSK-GEL media. Hence GigaCap CM-650M combines excellent pressure flow characteristics (Figure 1) with high dynamic binding capacities and recoveries for both, IgGs and smaller proteins. Latest surface modification technology was applied to increase the content of functional groups at the particle surface thus reaching binding capacities up to 100 mg IgG per ml resin (Figure 2).

**Pressure flow curves**

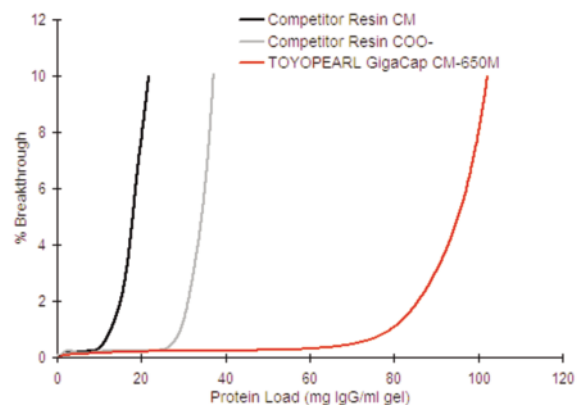


Conditions:

Column size: 22 mm ID x 20 cm L  
 Mobile phase: Water  
 Temperature: 25° C

Figure 1

**Breakthrough curves for IgG**

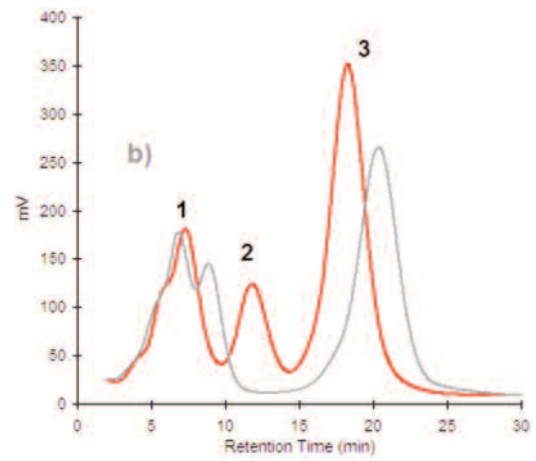
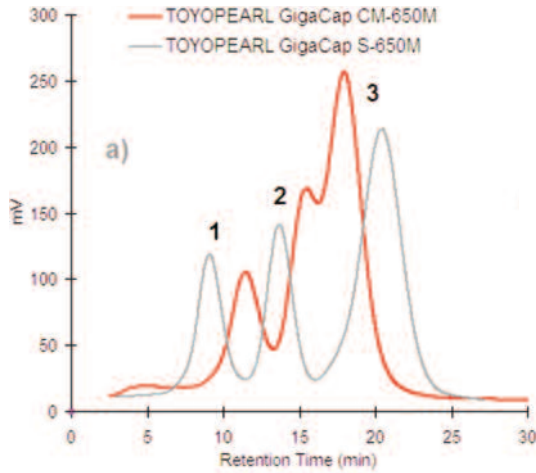


Conditions:

Column size: 6 mm ID x 4 cm height  
 Sample: polyclonal human IgG (1 mg/ml)  
 Loading buffer: 50 mM sodium acetate buffer (pH 4.7)  
 Elution buffer: 50 mM sodium acetate buffer (pH 4.7) + 0.5 mM NaCl  
 Linear velocity: 212 cm/h  
 Detection: UV @ 280 nm

Figure 2

## Selectivity of GigaCap S-650M and CM-650M



### Conditions:

Column size: 6.0 mm IDx40 mm, Flow rate; 1.0 ml/min  
 Buffer A: 20 mM Phosphate (pH 7.0)  
 Buffer B: 20 mM Phosphate + 1.0 M NaCl (pH 7.0)  
 Gradient: 60 min linear gradient from 100% A to 100% B

### Sample:

(a) 1. ribonuclease A (5.0 mg/ml), 2. cytochrome C (1.9 mg/ml), 3.lysozyme (3.8 mg/ml)  
 (b) 1. trypsinogen (3.8 mg/ml), 2. ribonuclease A (5.0 mg/ml) and 3.lysozyme (3.8 mg/ml)

### Inj. Volume:

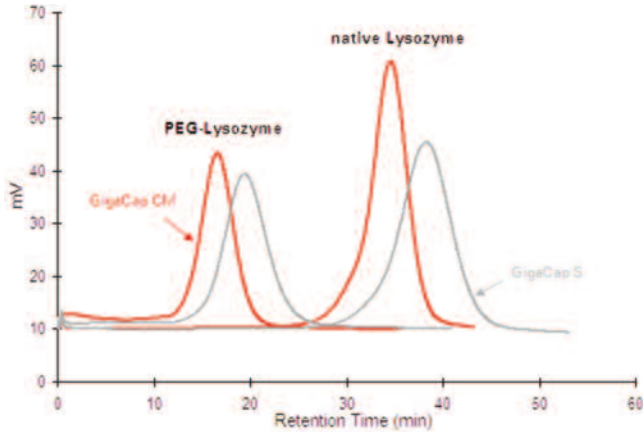
25 µl

### Detection:

UV @280nm

Figure 3

## Separation of PEGylated Lysozyme



### Conditions:

Column: Toyopearl GigaCap CM-650M, 6.0 mm ID x 4 cm  
 Buffer A: 50 mM Phosphate (pH 7.0)  
 Buffer B: 50 mM Phosphate + 0.5 M NaCl (pH 7.0)  
 Gradient: 0 to 10 min 100% A, 10 to 70 min 100% A to 100% B  
 Flow Rate: 1.0 ml/min  
 Sample: mono-PEG (5 kDa) Lysozyme (5.0 mg/ml), native Lysozyme (5.0 mg/ml)  
 Inj. Volume: 20 µL  
 Detection: UV@280nm

Figure 4

## Application

Toyopearl GigaCap cation exchange resins can be applied for the purification of various biomolecules. Figure 4 shows the separation of PEGylated proteins and the respective native form on both types of GigaCap cation exchange resins. Depending on the specific characteristics of the target molecule, GigaCap S-650M and CM-650M exhibit different selectivity as shown in Figure 3 for some standard proteins. Therefore it is strongly recommended to evaluate both, GigaCap CM-650M and S-650 M when developing a cation exchange purification step. For fast resin screening all GigaCap resins are available in 1 or 5 ml pre-packed ToyoScreen columns.

**For further details of choice and selection of the Toyopearl® resin that best suits your particular process purification needs,**

**please contact us:**

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**www.toyopearl.de**

## Ordering information

### Toyopearl GigaCap® CM-650M

Particle Size: 50 - 100 µm  
 Ion Exchange Capacity: 0.17 - 0.28 meq/ml resin

Part-No	Description	Resin Volume
21946	Toyopearl GigaCap® CM-650M	100 ml
21947	Toyopearl GigaCap® CM-650M	250 ml
21948	Toyopearl GigaCap® CM-650M	1 l
21949	Toyopearl GigaCap® CM-650M	5 l
21950	Toyopearl GigaCap® CM-650M	50 l
21951	ToyoScreen GigaCap CM-650M	1 ml x 6 ea.
21952	ToyoScreen GigaCap CM-650M	5 ml x 6 ea.