

# TOYOPEARL® AF-rProtein A HC-650F

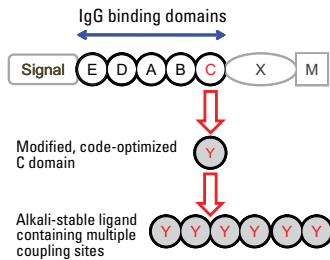
A High Capacity Protein A Resin for the Purification of Monoclonal Antibodies

TOYOPEARL  
PRODUCT OVERVIEW

## Introduction

TOYOPEARL AF-rProtein A HC-650F resin is the newest affinity resin to be introduced from Tosoh Bioscience. This new, high capacity protein A resin exhibits dynamic binding capacities of 70 g/L at residence times of 5 minutes and greater than 50 g/L at 2 minutes residence time with feed stock titers of 1.0 g/L to 10.0 g/L (Figure 1).

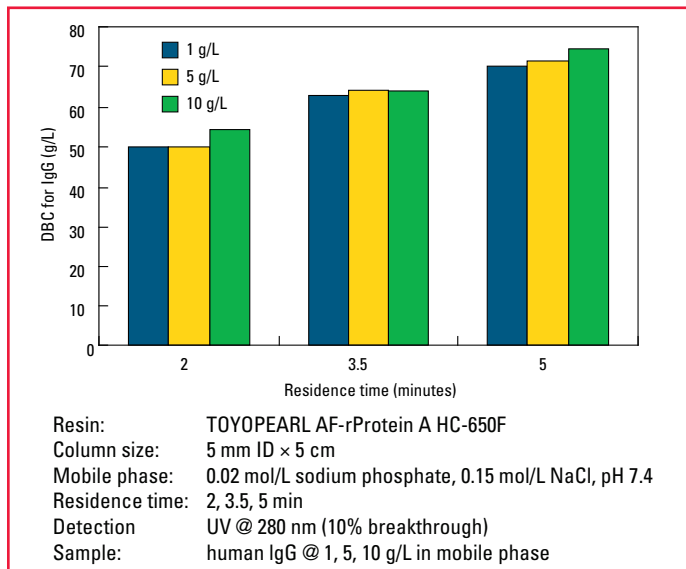
STRUCTURE:



## Product Attributes

Pore size (mean):	100 nm
Particle size (mean):	45 µm
Pressure rating:	0.3 MPa
Shipping buffer:	20% ethanol
pH stability:	2-13
Shelf life (estimated):	10 years

Figure 1. Dynamic binding capacity



An enhanced rProtein A ligand is bound to the TOYOPEARL HW-65F base bead via multipoint attachment resulting in excellent base stability (Figure 2) and low ligand leakage (Table 1) for up to 200 CIP cycles with 0.1 mol/L NaOH. TOYOPEARL AF-rProtein A HC-650F resin maintains 80% of initial dynamic binding capacity after 40 CIP cycles with 0.5 mol/L NaOH (Figure 3).

Figure 2. CIP using 0.1 mol/L NaOH

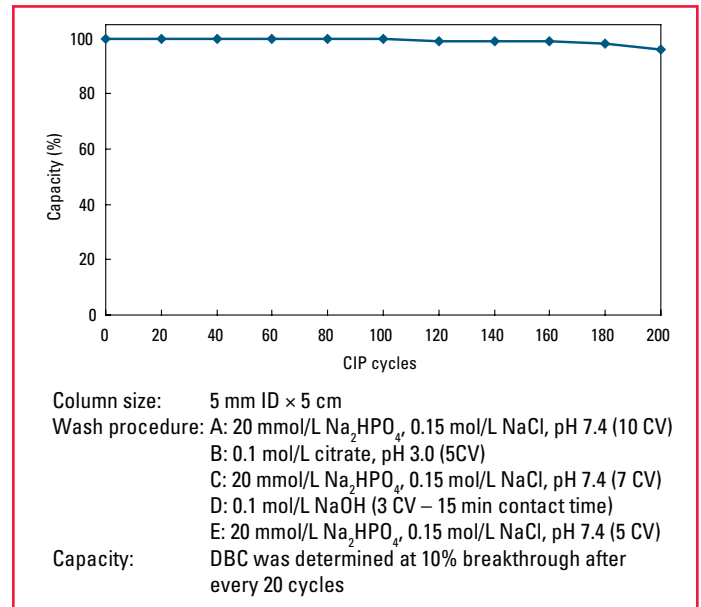
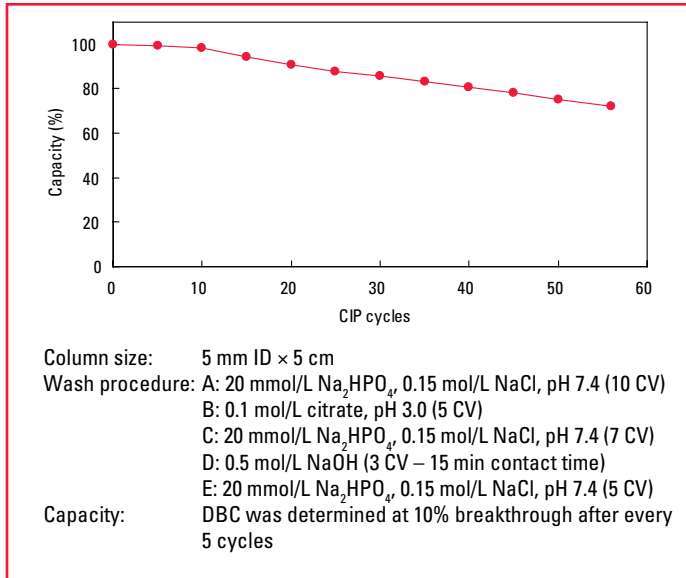


Table 1. Protein A ligand leakage

Amount of ligand leakage (ppm)	Before CIP		After 200 CIP cycles	
	Elution Buffer		Elution Buffer	
	citrate (pH 3.0)	glycine-HCl (pH 3.0)	citrate (pH 3.0)	glycine-HCl (pH 3.0)
	1.7	1.6	0.6	0.5
Amount of ligand leakage was determined with TOYOPEARL AF-rProtein A HC-650F ELISA				
ppm = ng/mg IgG				

**Figure 3.** CIP using 0.5 mol/L NaOH

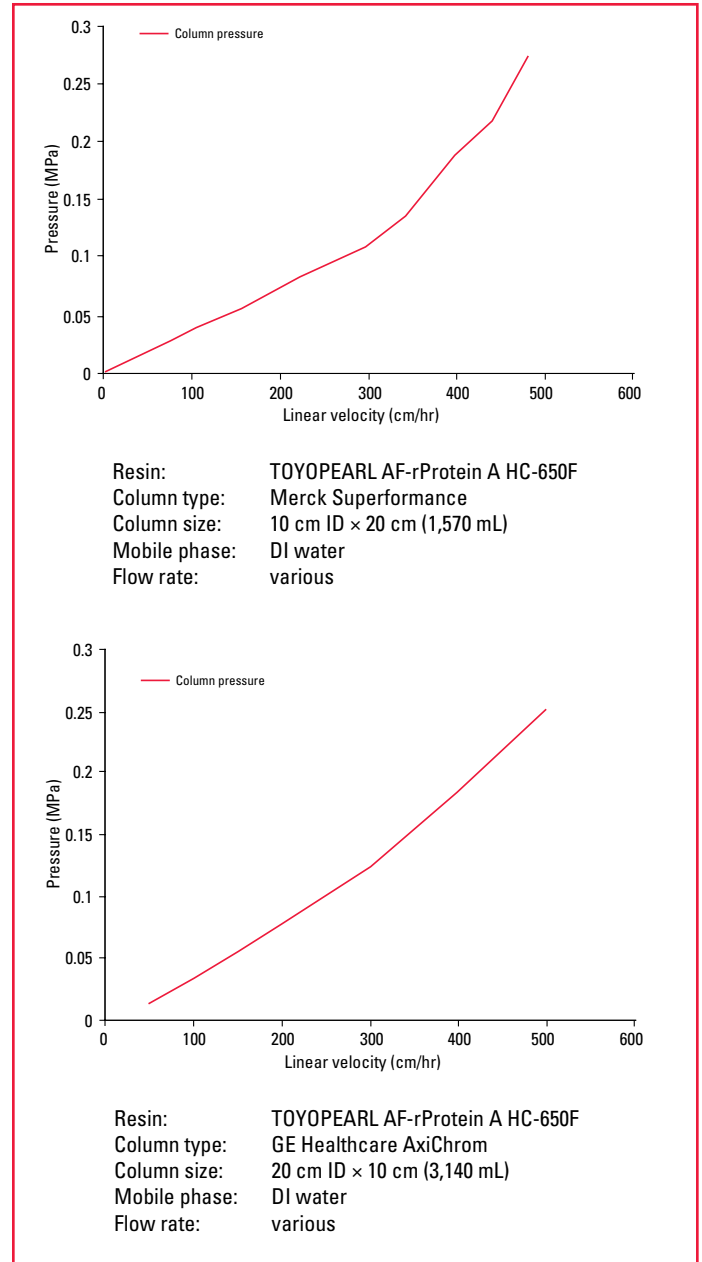


TOYOPEARL AF-rProtein A HC-650F resin is based on a hydrophilic, dimensionally stable base resin, TOYOPEARL HW-65, that exhibits excellent pressure-flow characteristics (Figure 4). The 100 nm pore diameter of the TOYOPEARL affinity resins can accommodate large globular proteins up to  $5 \times 10^6$ .

TOYOPEARL AF-rProtein A resins remain dimensionally stable within wide extremes of pH and ionic strength. Moreover, the semi-rigid TOYOPEARL AF-rProtein A HC-650F beads do not distort under flow rates that generate up to 0.3 MPa pressure.

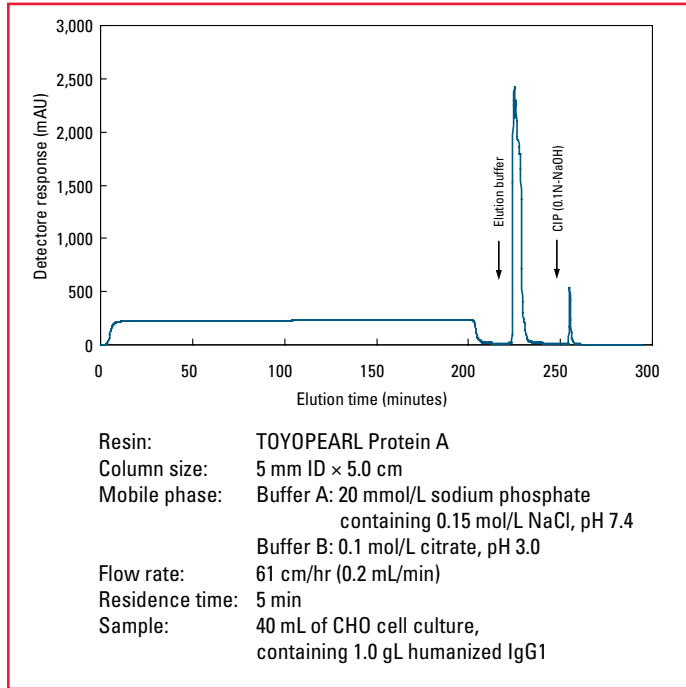
These properties, combined with a narrow particle size distribution, result in superior pressure-flow characteristics for the packed resin bed.

**Figure 4.** Pressure-flow curves

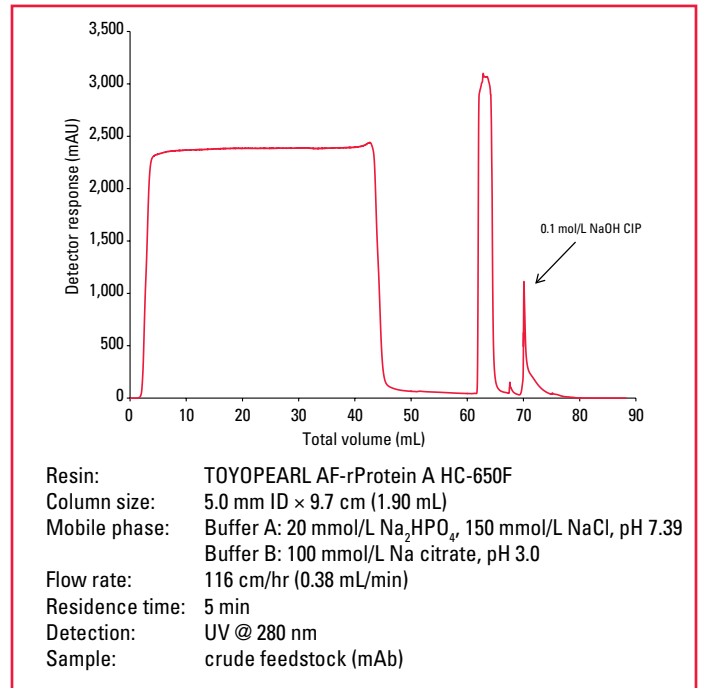


The purification of a monoclonal antibody from CHO cell culture supernatant with a titer of 1.0 g/L using TOYOPEARL AF-rProtein A HC-650F at 5 minutes residence time in a 5 cm bed height column can be seen in [Figure 5](#). Tailing is minimal on the elution peak and the eluted mAb is > 95% pure by SEC (data not shown). A second purification using a 9.7 cm bed height with a feedstock titer of 2.9 g/L and 5 minute residence time can be seen in [Figure 6](#).

**Figure 5.** Purification of monoclonal antibody with 5 cm bed height



**Figure 6.** Purification of monoclonal antibody with 9.7 cm bed height



## Ordering Information

Part#	Description	Resin Volume
23425	<b>TOYOPEARL AF-rProtein A HC-650F, 45 μm</b>	10 mL
23426	<b>TOYOPEARL AF-rProtein A HC-650F, 45 μm</b>	25 mL
23427	<b>TOYOPEARL AF-rProtein A HC-650F, 45 μm</b>	100 mL
23428	<b>TOYOPEARL AF-rProtein A HC-650F, 45 μm</b>	1 L
23429	<b>TOYOPEARL AF-rProtein A HC-650F, 45 μm</b>	5 L
23434	<b>TOYOPEARL AF-rProtein A HC-650F, 45 μm</b>	50 L
23433	<b>TOYOPEARL AF-rProtein A HC-650F ELISA</b>	-

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