CaptureSelect™ Human Growth Hormone Affinity Matrix

Catalog Numbers 1943160250, 194316001L, and 194316005L

Pub. No. MAN0017435 **Rev.** A.0

Product description

The CaptureSelect™ Human Growth Hormone Affinity Matrix purifies human Growth Hormone (HGH) from recombinant sources directly from clarified cell culture harvest in a single step.

The matrix has selectivity for recombinant HGH by making use of a 14 kDa single domain (VHH) antibody that is produced in yeast. It is completely free of animal-derived components. The ligand is immobilized on a high-quality chromatography matrix.

Product advantages

The CaptureSelect™ Human Growth Hormone Affinity Matrix offers:

- High recovery and purity in a single step
- Selective binding of recombinant human Growth Hormone
- Compatibility with FPLC systems

Product specifications

Specification	Description
Ligand	CaptureSelect™ HGH Affinity Ligand
Binding specificity	Recombinant human Growth Hormone
Matrix and particle size	Aldehyde-activated agarose, 65 µm
Dynamic binding capacity	>3 g HGH/L of matrix
Shipping solution	20% (v/v) ethanol

Contents and storage

Table 1 CaptureSelect™ Human Growth Hormone Affinity Matrix

Cat. No.	Amount	Storage
1943160250	250 mL	Room temperature for < 2 weeks
194316001L	1 L	
194316005L	5 L	

Conditions for use

Parameter	Conditions for use
Equilibration buffer	20 mM Tris or PBS, 0.15 M NaCl, pH 6–8
Elution buffer	Any of the following: • 20 mM Citric acid, pH 3.0 • 0.1 M Glycine pH 3
Strip buffer	Any of the following: • 0.1 M glycine, pH 2.0 • 0.5–1.0 M citric or acetic acid
Flow rate	50–150 cm/h
Pressure limit	≤ 2 bar
Cleaning solution	Any of the following: • 0.5–1.0 M acetic or citric acid • 25 mM NaOH (higher concentrations affect the functionality of the affinity ligand on the matrix). • PAB (120 mM phosphoric acid, 167 mM acetic acid, and 2.2% (v/v) benzyl alcohol) (Rogers *et al.*, 2009). Prepare fresh PAB every 4–5 days and store protected from light to minimize radicals that affect the functionality of the matrix.
Storage solution	20% (v/v) ethanol
Operating temperature	2–25°C

Flow characteristics

You can use agarose-based CaptureSelect™ affinity matrices at flow rates of 50–250 cm/h (Figure 1).

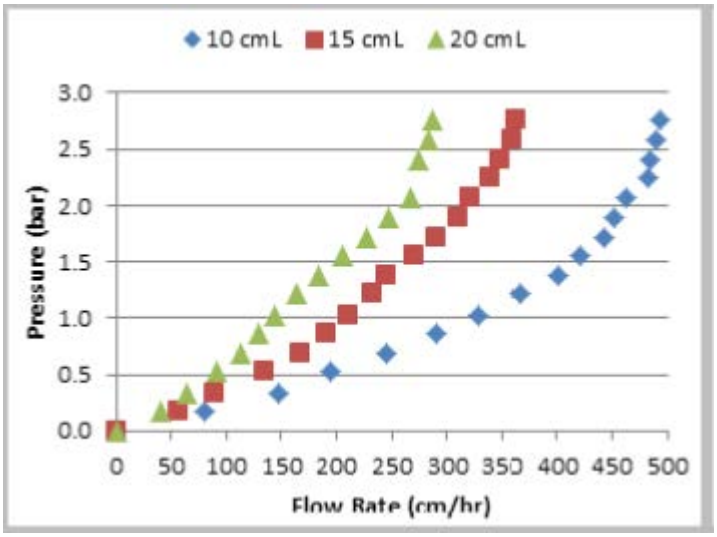

Figure 1 Typical pressure-flow curve for CaptureSelect™ resin at increasing bed heights: 10 cm (blue), 15 cm (red), and 20 cm (green). (10-cm diameter column packed at 3 bar; mobile phase=0.1 M NaCl.)

The resin can be operated at flow rates up to 250 cm/h, with a pressure drop that allows use in conventional low-pressure chromatography columns and systems. However, for optimal binding capacity and elution efficiency, we recommend flow rates of 50–150 cm/h. A low flow rate results in longer contact time of the load with the affinity matrix and drives the binding capacity. In addition, the elution fraction is more concentrated at a lower flow rate.

We recommend that you optimize each of your specific processes to achieve the best conditions for process time, binding capacity, and elution efficiency.

Guidelines for use—FPLC

For optimal matrix performance, optimize the conditions in the following procedure for your application.

1. Pack the column as described in *CaptureSelect™ Affinity Matrices: Guidelines for Packing* (Pub. No. MAN0009645).
2. Attach the packed column to the FPLC system.
3. Equilibrate the matrix with 10 column volumes (CVs) of equilibration buffer.
4. Determine the volume of sample to load, based on the dynamic binding capacity, concentration of the target molecule, and the column size. Optimum loading is at physiological pH. Avoid acidic conditions, which decrease binding efficiency.
5. Load the sample on the column.
6. Wash the sample with 5–10 CVs of equilibration buffer. To optimize washing efficiency, you can add NaCl to the equilibration buffer (up to 1.0 M).
7. Elute with 3–5 CVs of elution buffer.
8. Re-equilibrate the column in equilibration buffer.
9. Strip the column with 0.1 M glycine (pH 2.0), citric acid, or acetic acid (0.5–1.0 M).
10. Re-equilibrate the column in equilibration buffer to prepare the column for another purification run.
11. If the column will not be used immediately, store the matrix according to the storage parameters provided in "Conditions for use" on page 1.

Cleaning guidelines

Resin lifetime depends on how the resin is used and cleaned. Therefore, we recommend that you specifically evaluate each purification process.

Typical cleaning procedures for CaptureSelect™ resins include combinations of acidic cleaning followed by low concentrations of NaOH, before storing in 20% (v/v) ethanol at neutral pH (Eifler *et al.*, 2014).

To optimize column cleaning, consider these guidelines:

- Pump the cleaning solution through the column for 15–20 minutes in upflow.
- Incorporate a static hold to increase the time that the cleaning solution is in the column while minimizing the volume of cleaning solution required.
- When a combination of acidic and mildly caustic cleaning agents is used, apply the NaOH solution as a final cleaning agent to minimize the risk of irreversibly binding impurities on the column.
- In some purification processes, 20% (v/v) isopropanol (with or without acid) and 6.0 M guanidine-HCl can help remove discoloration.

Example application–FPLC

In this example, HGH was purified from *E. coli* harvest and eluted from the column. After the resin was loaded, the column was equilibrated, then eluted. Conditions were as follows:

- **Column**—CaptureSelect™ Human Growth Hormone Affinity Matrix
- **Equilibration buffer**—PBS, pH 7.0
- **Load**—Clarified cell culture harvest of HGH production in *E. coli*
- **Elution buffer**—20 mM Citric acid, pH 3.0
- **Flow**—150 cm/h

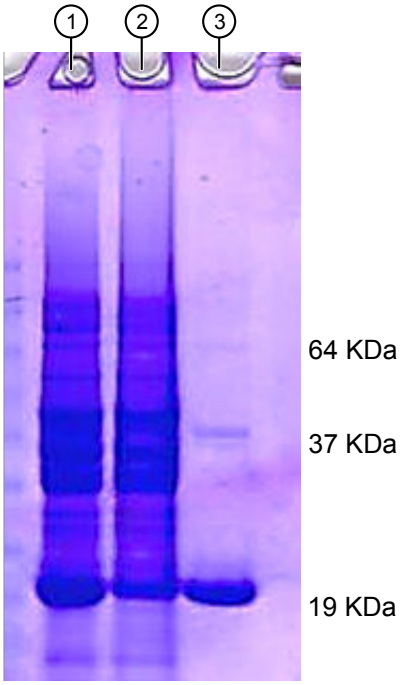

Figure 2 Non reduced SDS-PAGE of the purification of human Growth Hormone showing high yield and purity in a single step.

① Load
② Flow through
③ Elution

Supporting products

A biotinylated anti-HGH conjugate is available. Applications for the CaptureSelect™ Biotin Anti-HGH conjugate include:

- ELISA
- Western blot
- Gyros™ Gyrolab™-based immunoassays
- Label-free detection platforms such as those based on surface plasmon resonance (Biacore™ and IBIS-MX96 systems) and biolayer interferometry (ForteBio™ Octet™ Systems).

In addition, a ligand leakage ELISA is available for detecting possible leached ligand in the elution fractions of the CaptureSelect™ Human Growth Hormone Affinity Matrix.

Product	Amount	Cat. No.
CaptureSelect™ HGH Ligand Leakage ELISA	1 assay	810316001
	10 assays	810316010
CaptureSelect™ Biotin Anti-HGH Conjugate	100 µg	7103160100
	500 µg	7103160500

Regulatory Support File

A Regulatory Support File (RSF) is available for the resin. It contains detailed information about the resin and the manufacturing process. Contact your local sales representative to obtain a copy.

For more information

For more information on CaptureSelect™ products and ligand leakage ELISA products, go to **www.thermofisher.com/captureselect**.

Customer and technical support

Visit **thermofisher.com/support** for the latest in services and support, including:

- Worldwide contact telephone numbers
- Product support, including:
  - Product FAQs
  - Software, patches, and updates
  - Training for many applications and instruments
- Order and web support
- Product documentation, including:
  - User guides, manuals, and protocols
  - Certificates of Analysis
  - Safety Data Sheets (SDSs; also known as MSDSs)

  Note: For SDSs for reagents and chemicals from other manufacturers, contact the manufacturer.

Limited product warranty

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References

Rogers, M. *et al.* 2009. Development of a rapid sanitization solution for silica-based protein A affinity adsorbents. *Journal of Chromatography A.* 1216:4589–4596.

Eifler, N. *et al.* 2014. Development of a novel affinity chromatography resin for platform purification of lambda fabs. *Biotechnology Progress* DOI:10.1002/btpr.1958.

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Revision	Date	Description
A.0	27 November 2017	New document.

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