CaptureSelect™ Protein Affinity Resins

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WARNING! Read the Safety Data Sheets (SDSs) and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves. Safety Data Sheets (SDSs) are available from thermofisher.com/support.

Product description

CaptureSelect™ affinity resins can be used for the purification and isolation of proteins and/or antibodies and antibody subtypes from complex sources such as plasma, serum, and cell culture supernatants.

Storage

Store all resins and columns at 2–8°C. Do not freeze.

Product specifications

Table 1 Available CaptureSelect™ protein affinity resins

CaptureSelect™ affinity resin and binding specificity	Resin and particle size	Dynamic binding capacity per mL of resin
AAT-XL (human alpha-1 antitrypsin)[1]	Epoxide-activated agarose, 65 ± 10 µm	>15 mg
Antithrombin III (human ATIII)	NHS-activated agarose, 90 ± 10 µm	>6 mg
C1-InhXL (human C1 esterase inhibitor)	Epoxide-activated POROS™ resin, 50 ± 10 µm	>4 mg
C5 (human complement component 5)	Epoxide-activated agarose, 65 ± 10 µm	t.b.d.
Ctag-XL (C-terminal E-P-E-A; glutamic acid-proline-glutamic acid-alanine)[1]	Epoxide-activated agarose, 65 ± 10 µm	>400 nmol
Factor II(a) (coagulation factor II(a), prothrombin and thrombin)	Epoxide-activated agarose, 65 ± 10 µm	>6 mg
Factor H (complement factor H, FH)	Epoxide-activated agarose, 65 ± 10 µm	>2 mg
FibXL (human fibrinogen)	Epoxide-activated POROS™ resin, 50 ± 10 µm	>15 mg
FSH (human follicle stimulating factor)[1]	Aldehyde-activated agarose, 65 ± 10 µm	~3 mg
FX (human Factor X)[1]	Epoxide-activated agarose, 65 ± 10 µm	>10 mg
GM-CSF (human granulocyte-macrophage colony-stimulating factor)	Epoxide-activated agarose, 65 ± 10 µm	>2 mg
hCG (human chorionic gonadotropin)[1]	Aldehyde-activated agarose, 65 ± 10 µm	~4 mg
hGH (human growth hormone)[1]	Aldehyde-activated agarose, 65 ± 10 µm	~3 mg
HSA (human serum albumin)[1]	Aldehyde-activated agarose, 65 ± 10 µm	~15 mg
MultiSpecies Albumin Depletion (MSA)	Aldehyde-activated agarose, 35 ± 10 µm	t.b.d.
Prothrombin	Epoxide-activated agarose, 65 ± 10 µm	>5 mg
tPA (human tissue plasminogen activator)[1]	Aldehyde-activated agarose, 65 ± 10 µm	>8 mg
Transferrin (human TF)	Aldehyde-activated agarose, 35 ± 10 µm	>8 mg
TSH (human thyroid-stimulating hormone)[1]	Epoxide-activated agarose, 65 ± 10 µm	>5 mg

[1] **Available in volumes suitable for cGMP, see Table 5.**

Table 2 Pre-packed CaptureSelect™ C-tagXL column specifications

Specification	Description
Column volume	1 mL and 5 mL
Column dimension	• 7 × 25 mm (1 mL) • 14 × 32.5 mm (5 mL)
Operating pressure	<2 bar (0.2 MPa)
Maximum pressure	3 bar (0.3 MPa)

Specification	Description
Flow rates	• 0.5–1.0 mL/minute (1-mL column) • 2.5–5.0 mL/minute (5-mL column) **Note:** Lower flow rates, especially during sample loading, can increase the dynamic binding capacity of the columns due to prolonged contact time of the sample with the affinity resin.
Storage solution	20% (v/v) ethanol

Note: Pre-packed CaptureSelect™ columns are not appropriate for process development.

Conditions for use

Agarose based resins have flow rates of 50-200 cm/hour and a pressure limit of 2 bar. POROS™ based resins are suited for high flow rates and have a pressure limit of 100 bar (1,450 psi, 10 MPa).

Table 3 CaptureSelect™ affinity resin conditions

CaptureSelect™ affinity resin	Equilibration/wash buffer	Elution buffer
AAT-XL (human alpha-1 antitrypsin)	50 mM Tris, 150 mM NaCl (pH 7)	20 mM Tris, 2.0 M $MgCl_2$ (pH 6.0)
ATIII (human)	20 mM Tris or PBS (pH 7.0–7.5)	20 mM Tris, 2.0 M $MgCl_2$ (pH 7.0)
C1-InhXL (human C1 esterase inhibitor)	20 mM Tris or PBS (pH 7.0–7.5)	50 mM sodium acetate, 1.0 M $MgCl_2$ (pH 5.0)
C5 (human complement component 5)	PBS or 50 mM Tris, 150 mM NaCl (pH 7)	100 mM Glycine (pH 3.0)
Ctag-XL (C-terminal E-P-E-A; glutamic acid-proline-glutamic acid-alanine)	**Physiological conditions:** 20 mM Tris or PBS (pH 7.0–7.4) **Denaturing conditions:** 50 mM Tris, up to 8 M Urea (pH 7.0–7.4) – 50 mM Tris, up to 1 M guanidine (pH 7.0–7.4)	**Neutral pH**: 20 mM Tris, 2.0 M $MgCl_2$ (pH 7), 20 mM Tris, 1.0 M NaCl, 50% (v/v) propylene glycol, 20 mM Tris, 2 mM S-E-P-E-A. **Acidic pH**: 20 mM citric acid or acetic acid (pH 3–4), or 0.1 M glycine (pH 3.0)
Factor II(a) (prothrombin/trombin)	20 mM Tris or PBS (pH 7.0-7.5)	50 mM Tris, 2.0 M $MgCl_2$ (pH 7)
Factor H (FH)	20 mM Tris or PBS (pH 7.0-7.5)	20 mM citric acid (pH 3.0)
FibXL (human fibrinogen)	20 mM Tris (when $MgCl_2$ is used for elution) or PBS (pH 7.0-7.5)	**Neutral pH**: 20 mM Tris 1.0 $MgCl_2$ + 40% (v/v) propylene glycol **Acidic pH:** 50 mM citric or acetic acid (pH 3.0), 0.1 M glycine (pH 3.0)
FSH (human follicle stimulating factor)	20 mM Tris or PBS (pH 7.0–7.5)	**Neutral pH**: 20 mM Tris with 2 M $MgCl_2$ (pH 7.0–7.5) **Acidic pH**: 0.1 M glycine (pH 3.0)
FX (human Factor X)	50 mM Tris, 150 mM NaCl, 5 mM $CaCl_2$ (pH 7)	50 mM Tris, 150 mM NaCl, 5 mM EDTA (pH 7)
GM-CSF (human granulocyte-macrophage colony-stimulating factor)	20 mM Tris or PBS (pH 7.0–7.5)	50 mM citric or acetic acid (pH 3.0), 0.1 M glycine (pH 3.0)
hCG (human chorionic gonadotropin)	20 mM Tris or PBS (pH 7.0–7.5)	50 mM citric or acetic acid (pH 3.0), 0.1 M glycine (pH 3.0)
hGH (human growth hormone)	20 mM Tris or PBS (pH 7.0–7.5)	50 mM citric acid (pH 3.0)
HSA (human serum albumin)	20 mM Tris or PBS (pH 7.0–7.5)	**Neutral pH**: 20 mM Tris (pH 7.4), with 2 M $MgCl_2$ or with 1 M NaCl + 50%(v/v) propylene glycol or with 1 M NaCl + 0.5 M L-arginine | **Acidic pH:** 0.1 M glycine (pH 3.0)
MSA (Albumin Depletion)	20 mM Tris or PBS (pH 7.0–7.5)	
Prothrombin	50 mM Tris, 150 mM NaCl, 5 mM $CaCl_2$ (pH 7)	50 mM Tris, 150 mM NaCl, 5 mM EDTA (pH 7)
tPA (human tissue plasminogen activator)	20 mM Tris or PBS, 0.15 M NaCl (pH 6–8)	**Neutral pH**: 20 mM Tris, 2.0 M $MgCl_2$, 0.2 M arginine (pH 7.0) **Acidic pH**: 0.1 M glycine (pH 3.0)

CaptureSelect™ affinity resin	Equilibration/wash buffer	Elution buffer
Transferrin (human TF)	20 mM Tris or PBS (pH 7.0–7.5)	**Neutral pH**: 20mM Tris (pH 7.0), 2.0 M $MgCl_2$, 20mM Tris (pH 7.0), 1.0 M NaCl, 50% (v/v) propylene glycol **Acidic pH**: 20mM Citric acid (pH 3.0)
TSH (human thyroid-stimulating hormone)	20 mM Tris or PBS, 0.15 M NaCl (pH 6–8)	20 mM Citric acid (pH 3.0), 0.1 M Glycine (pH 3)

Instructions for use

1. Pack the column.
2. Equilibrate with 5–10 column volumes (CV) of the equilibration/wash buffer recommended in “Conditions for use” on page 2.
3. Prepare and load the sample.

   The sample loading volume depends on the concentration of the target molecule and the dynamic binding capacity of the resin. See “Storage” on page 1.
   - Dissolve, dilute, or exchange samples into the equilibration buffer. This is particularly important for large samples (greater than 25% of the column volume).
   - Centrifuge and filter samples (0.22 µm or 0.45 µm) before injection.
4. Wash with 5 to 10 CV of the equilibration/wash buffer recommended in “Conditions for use” on page 2, or until you see a stable baseline.
5. Elute with 5–10 CV of the elution buffer recommended in “Conditions for use” on page 2, or until you see a stable baseline.
6. Re-equilibrate with 5–10 CV of the equilibration/wash buffer recommended in “Conditions for use” on page 2, or until you see a stable baseline.
7. Re-equilibrate in equilibration/wash buffer.

   If the column will not be used immediately, store the resin in 20% ethanol at 4°C (39°F), stable for up to 1 year.

Example application with CaptureSelect™ AAT-XL affinity resin

In this example, AAT was purified in 24 purification runs, loading 1 L feed/run on the same 89 mL column with partially purified human plasma containing ~1 g AAT/ L. This resulted in high and consistent yield and purity over all 24 runs. The following conditions were used:

- **Column**—88.6 mL (CV) (5 x 4.5 cm) CaptureSelect™ AAT-XL Affinity Matrix
- **Equilibration**—TBS, pH 7
- **Load**—Partial purified human plasma 1 g/L AAT, pH 7.2 50 mS/cm loaded to 15.6 g AAT/L resin
- **Wash**—20 mM Tris, 0.4 M $MgCl_2$, pH 7.2
- **Elution buffer**—20 mM Tris, 2 M $MgCl_2$, pH 6.0
- **Strip**—0.1 M Glycine, pH 2.0

Go to www.thermofisher.com/captureselect for additional examples.

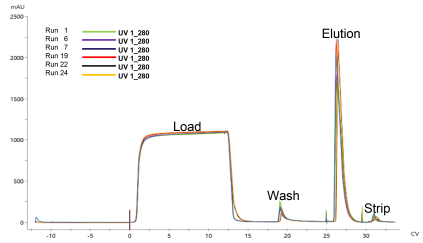

Figure 1 Overlay of six chromatograms of the purification runs

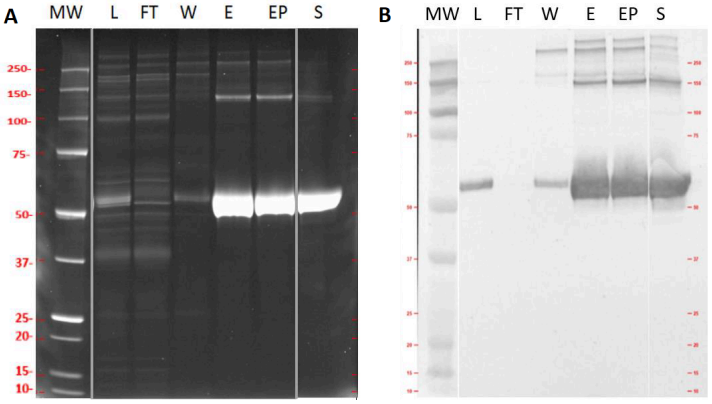

Figure 2 Analysis of the load, flowthrough, and elution fractions of the AAT purifcation. 3A: SDS PAGE (Coomassie Fluor Orange stained) 3B: Western Blot (developed with AAT specific primary antibody (ThermoFisher #MA1-10626) and secondary antibody donkey anti-mouse Ig H+L (Jackson Immunoresearch, 715-055-150).

① Lane 1: MW marker (MW)
② Lane 2: Load (L)
③ Lane 3: Flow through (FT)
④ Lane 4: Wash (W)
⑤ Lane 5: Elution pool (E) cycle 7-14
⑥ Lane 6: Elution of total pool (EP) cycle 1-24
⑦ AAT standard (S)

Ordering information

Table 4 CaptureSelect™ affinity resins

CaptureSelect™ affinity resin and binding specificity	Amount	Cat. No.
AAT-XL (human Alpha-1 Antitrypsin)	5 mL	2943832005
	10 mL	2943832010
	50 mL	2943832050
Antithrombin III (human ATIII)	5 mL	190317005

CaptureSelect™ affinity resin and binding specificity	Amount	Cat. No.
	10 mL	190317010
	50 mL	190317050
C1-InhXL (human C1 esterase inhibitor)	5 mL	2803402005
	10 mL	2803402010
	50 mL	2803402050
C5 (human complement 5)	5 mL	2943692005
	10 mL	2943692010
	50 mL	2943692050
C-tagXL (C-terminal E-P-E-A; glutamic acid-proline-glutamic acid-alanine)	5 mL	2943072005
	10 mL	2943072010
	50 mL	2943072050
Factor II(a) (prothrombin/trombin)	5 mL	2944052005
	10 mL	2944052010
	50 mL	2944052050
Factor H (FH)	5 mL	2944062005
	10 mL	2944062010
	50 mL	2944062050
FibXL (human fibrinogen)	5 mL	2802912005
	10 mL	2802912010
	50 mL	2802912050
FSH (human follicle stimulating factor)	5 mL	194318005
	10 mL	194318010
	50 mL	194318050
GM-CSF (human granulocyte-macrophage colony-stimulating factor)	5 mL	2943472005
	10 mL	2943472010
	50 mL	2943472050
HSA (human serum albumin)	5 mL	191297005
	10 mL	191297010
	50 mL	191297050
hCG (human chorionic gonadotropin)	5 mL	194341005
	10 mL	194341010
	50 mL	194341050
hGH (human growth hormone)	5 mL	1943160005
	10 mL	1943160010
	50 mL	1943160050
MultiSpecies Albumin Depletion	5 mL	191085305
	10 mL	191085310
	50 mL	191085350
Prothrombin	5 mL	1943452005
	10 mL	1943452010
	50 mL	1943452050
tPA (human tissue plasminogen activator)	5 mL	2943430005
	10 mL	2943430010
	50 mL	2943430050
Transferrin (human TF)	5 mL	191306005
	10 mL	191306010
	50 mL	191306050
TSH (human thyroid-stimulating hormone)	5 mL	2943562005
	10 mL	2943562010
	50 mL	2943562050

Table 5 cGMP suitable volumes of CaptureSelect™ affinity resins

CaptureSelect™ affinity resin and binding specificity	Amount	Cat. No.
AAT-XL (human Alpha-1 Antitrypsin)	250 mL	1943832250
	1 L	194383201L
	5 L	194383205L
C-tagXL (C-terminal E-P-E-A; glutamic acid-proline-glutamic acid-alanine)	250 mL	1943072250
	1 L	194307201L
	5 L	194307205L
FSH (human follicle stimulating factor)	250 mL	1943180250
	1 L	19431801L
	5 L	19431805L
FX (human Factor X)	250 mL	1943702250
	1 L	194370201L
	5 L	194370205L
HSA (human serum albumin)	250 mL	1912970250
	1 L	19129701L
	5 L	19129705L
hCG (human chorionic gonadotropin)	250 mL	1943410250
	1 L	19434101L
	5 L	19434105L
hGH (human growth hormone)	250 mL	1943160250
	1 L	194316001L
	5 L	194316005L
tPA (human tissue plasminogen activator)	250 mL	1943430250
	1 L	194343001L
	5 L	194343005L
TSH (human thyroid-stimulating hormone)	250 mL	1943562250

CaptureSelect™ affinity resin and binding specificity	Amount	Cat. No.
	1 L	194356201L
	5 L	194356205L

Table 6 CaptureSelect™ Pre-packed columns

CaptureSelect™ Pre-packed columns and binding specificity	Amount	Cat. No.
C-tagXL (C-terminal 4 amino acid tag E-P-E-A / independent of species)	5 × 1 mL prepacked column	494307201
	1 × 5 mL prepacked column	494307205

Table 7 CaptureSelect™ Robocolumn

CaptureSelect™ Robocolumn and binding specificity	Amount	Cat. No.
C-tagXL (C-terminal 4 amino acid tag E-P-E-A / independent of species)	200 µL (robocolumn)	5943072200
hGH (human growth hormone)	200 µL (robocolumn)	5943160200
AAT-XL (human alpha1-antitrypsin)	200 µL (robocolumn)	5943832200

Table 8 CaptureSelect™ Minichrom

CaptureSelect™ Minichrom and binding specificity	Amount	Cat. No.
C-tagXL (C-terminal 4 amino acid tag E-P-E-A /independent of species)	1 mL (minichrom)	5943072001
C-tagXL (C-terminal 4 amino acid tag E-P-E-A /independent of species)	5 mL (minichrom)	5943072005

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  - 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.

For more information

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

Limited product warranty

Life Technologies Corporation and/or its affiliate(s) warrant their products as set forth in the Life Technologies' General Terms and Conditions of Sale found on Life Technologies' website at **www.thermofisher.com/us/en/home/global/terms-and-conditions.html**. If you have any questions, please contact Life Technologies at **www.thermofisher.com/support**.

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For descriptions of symbols on product labels or product documents, go to thermofisher.com/symbols-definition.

Revision history: Pub. No. MAN0017181 E

Revision	Date	Description
E	28 May 2025	Update publication to remove reference to human F7 associated with Prothrombin.
D	16 October 2024	Update publication for the release of Factor II(a) and Factor H.
C	14 May 2024	Update regulatory statement and C1-InhXL binding capacity.
B.0	31 October 2023	Updates to Product specifications, Conditions for use, Example application, and Ordering information.
A.0	27 June 2017	Replaces 4486257. Added new product information.