Agilent Human 14
Multiple Affinity
Removal System Spin
Cartridges for the
Depletion of
High-Abundant
Proteins from Human
Proteomic Samples

Instructions
Second edition
October 2008

Agilent Technologies
**General Information**

**Introduction**

The Agilent Human 14 Multiple Affinity Removal System comprises a family of immunodepletion products based on affinity interactions and optimized buffers for sample loading, washing, eluting, and regenerating. This spin cartridge is specifically designed to remove 14 high-abundant proteins from human biological fluids such as plasma, serum, and cerebral spinal fluid (CSF). This technology enables removal of albumin, IgG, antitrypsin, IgA, transferrin, haptoglobin, fibrinogen, alpha2-macroglobulin, alpha1-acid glycoprotein, IgM, apolipoprotein A1, apolipoprotein AII, complement C3, and transthyretin with a single device. The targeted high-abundant proteins are simultaneously removed when crude biological samples are passed through the cartridge. Selective immunodepletion provides an enriched pool of low-abundant proteins for downstream proteomics analysis.

Specific removal of 14 high-abundant proteins depletes approximately 94% of total protein mass from human serum/plasma. The low-abundant proteins in the flow-through fractions can be studied. Removal of high-abundant proteins enables improved resolution and dynamic range for one-dimensional gel electrophoresis (1DGE), two-dimensional gel electrophoresis (2DGE), and liquid chromatography/mass spectrometry.
Instructions

LC/MS. The collected flow through fractions may need to be concentrated dependent upon the down-
stream applications.
Human 14 Multiple Affinity Removal System

The Agilent Human 14 Multiple Affinity Removal System is specially designed to allow for close study of low-abundant proteins present in flow-through fractions (see Figure 1).

**Figure 1** The Multiple Affinity Removal System.

Human Proteins Depleted:
- Albumin, IgG, Actin, IgM, IgA, Transferrin, Haptoglobin, Fibrinogen, Alpha2-Macroglobulin, Alpha1-Acid Glycoprotein, IgM, Apolipoprotein AI, Apolipoprotein AII, Complement C3, Transthyretin

Apply Crude Human Serum/Plasma

Fraction #1 Low-Abundant Proteins

Fraction #2 High-Abundant Proteins
Product Description

The Agilent Human 14 Multiple Affinity Removal System Spin Cartridge and its accessories are shown in Table 1.
Table 1  Agilent Human 14 Multiple Affinity Removal System Spin Cartridge and Starter Reagent Kit

<table>
<thead>
<tr>
<th>Product no.</th>
<th>Product name</th>
<th>Product description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5188-6560</td>
<td>0.45-mL affinity, spin cartridge, 1 each</td>
<td>Removes human albumin, IgG, antitrypsin, IgA, transferrin, haptoglobin, fibrinogen, alpha2-macroglobulin, alpha1-acid glycoprotein, IgM, apolipoprotein AI, apolipoprotein AII, complement C3, and transthyretin</td>
</tr>
<tr>
<td>5185-5987</td>
<td>Buffer A, 1 L</td>
<td>Ready-to-use, optimized buffer for loading, washing, and equilibrating cartridge</td>
</tr>
<tr>
<td>5185-5988</td>
<td>Buffer B, 1 L</td>
<td>Ready-to-use, optimized buffer for elution of bound proteins from cartridge</td>
</tr>
<tr>
<td>5185-5990</td>
<td>Spin filters 0.22 µm, 1 pack of 25</td>
<td>For sample cleanup before loading cartridge</td>
</tr>
<tr>
<td>5185-5991</td>
<td>Protein spin concentrators, 5kDa MWCO, 4 mL, 1 pack of 25</td>
<td>For concentrating flow-through fractions</td>
</tr>
<tr>
<td>5188-5249</td>
<td>Luer-Lock adapters, 1 pack of 2</td>
<td>Allows attachment of Luer-Lock syringes to spin cartridge</td>
</tr>
<tr>
<td>Product no.</td>
<td>Product name</td>
<td>Product description</td>
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<tr>
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</tr>
<tr>
<td>5188-5250</td>
<td>5-mL plastic Luer-Lock syringes, 1 pack of 2</td>
<td>For washing, eluting, and re-equilibrating buffers through spin cartridge</td>
</tr>
<tr>
<td>5188-5251</td>
<td>1.5-mL screwtop Eppendorf-style tubes, 1 pack of 100</td>
<td>Used for collecting fractions from spin cartridge</td>
</tr>
<tr>
<td>5188-5252</td>
<td>Spin cartridge screw caps and plugs, 1 pack of 6 each</td>
<td>Extra caps and plugs for sealing the top and bottom of affinity spin cartridges</td>
</tr>
<tr>
<td>5188-5253</td>
<td>Teflon Luer-Lock needles, 1 pack of 10</td>
<td>For transferring solutions with Luer-Lock Syringes</td>
</tr>
<tr>
<td>5188-5254</td>
<td>Starter Reagent Kit for Spin Cartridges</td>
<td>Under normal conditions, the kit should last for approximately 200 spin cartridge uses.</td>
</tr>
<tr>
<td></td>
<td>Buffer A: 1 L</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Buffer B: 1 L</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Spin filters 0.22 μm: 2 packs of 25</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Protein concentrators: 1 pack of 25</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Luer-Lock adapters: 1 pack of 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5-mL plastic Luer-Lock syringes: 1 pack of 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.5-mL microtubes: 6 packs of 100</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Spin cartridge extra caps and plugs, 1 pack of 6 each</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Teflon Luer-Lock needles, 1 pack of 10</td>
<td></td>
</tr>
</tbody>
</table>
For higher capacity Multiple Affinity Removal System Devices, and if automated immunodepletion is needed, refer to Human 14 Multiple Affinity Removal System Columns (part number 5188-6557 - 4.6 x 50 mm, 5188-6558 - 4.6 x 100 mm, 5188-6559 - 10 x 100 mm) for use with HPLC instrumentation.

See www.agilent.com/chem/bioreagents for more information and links to mouse protein removal devices.
Full Protocol for Human 14 Multiple Affinity Removal System Spin Cartridge

(Cartridge capacity: 8–10 µL human serum/plasma *)

During use, never let the spin cartridge frits or resin bed run dry. If this happens, see Recommendations section for cartridge rewetting procedure.

Additional Materials Required

• Microcentrifuge with adjustable centrifugal force (capable of spinning at 100 x g) and timer such as the Eppendorf Model 5415D
• 50-mL vessels (for example, polypropylene tubes) to hold working quantities of Buffers A and B during procedure
• Adjustable pipettes for delivering up to 400-µL aliquots

* Capacity testing was done with pooled normal plasma from Rockland Immunochemicals (D519-04). Consult certificate of analysis to verify your capacity. It is the user’s responsibility to adjust loading volume to compensate for the fact that the concentrations of some high-abundant proteins can vary widely depending on the sample origin (source). Several serum/plasma proteins such as alpha1-antitrypsin, haptoglobin, fibrinogen, IgG, and alpha1-acid glycoprotein rise several folds in response to stress, infection, inflammation, or tissue necrosis and are known as acute phase reactants (Henry, J.B. 1996 - Clinical Diagnosis and Management by Laboratory Methods).
• Transfer pipettes
• 1.5-mL screw-top microtubes/Eppendorf-style tubes (collection tubes, part number 5188-5251)
• Luer-Lock adapters (part number 5188-5249)
• 5-mL plastic Luer-Lock syringes (part number 5188-5250)
• Buffer A, 1 L (part number 5185-5987)
• Buffer B, 1 L (part number 5185-5988)

Material Preparation
• Fill two 50-mL vessels with appropriate amounts of Buffers A and B to use throughout the procedure for the specific number of samples you wish to process (approximately 5-mL Buffer A and 2-mL Buffer B per each 8–10 µL serum/plasma sample).
• Label two 5-mL Luer-Lock syringes with “A” and “B” for using later in the procedure during the cartridge elution and re-equilibration steps.

NOTE
Remove Agilent Human 14 Multiple Affinity Removal System Spin Cartridge from refrigerator and allow cartridge to equilibrate to room temperature before use.
Procedure

1  **Dilute and filter sample.** Prepare the sample by diluting 8–10 µL of human serum/plasma with Buffer A to a final volume of 200 µL. For example: if the recommended cartridge loading capacity on the certificate is 10 µL of serum/plasma, dilute 10 µL of serum/plasma with 190-µL Buffer A† to a final volume of 200 µL.

If you plan to perform several successive runs on the cartridge, increase amount of diluted sample accordingly.

Filter diluted samples through a 0.22-µm spin filter (part number 5185-5990) to prevent clogging of spin cartridge frits.

2  **Prepare spin cartridge.** Remove cartridge cap and plug. Attach Luer-Lock adapter to spin cartridge, draw 4 mL of Buffer A into syringe and then attach it to Luer-Lock on spin cartridge. Dispense Buffer A through spin cartridge to prepare resin and to remove any trapped air bubbles. With a transfer pipette, remove excess Buffer A from top of the spin cartridge.

* Protocol may be applied to other human biological fluids with necessary adjustments in sample volume based on albumin concentration.

† Addition of protease inhibitors in Buffer A for sample dilution helps prevent protein degradation.
3 **Apply sample.** Remove the Luer-Lock adapter and place spin cartridge in a screw-top collection tube and label it "Flow-through 1" or "F1". Add 200 µL of diluted serum/plasma sample to spin cartridge and centrifuge for 1.0 minute at 100 × g (or lowest possible setting on centrifuge; see note below). Cap the spin cartridge loosely or leave open during centrifugation so the sample is able to flow. Collect the flow-through fraction in the collection tube F1. The resin bed and frits should remain moist, not dry, after centrifugation.

4 **Incubate.** Remove spin cartridge from centrifuge and allow to sit for 5 minutes at room temperature.

5 **Wash and collect flow-through fraction F1.** Add 400 µL of Buffer A to the top of the resin bed and centrifuge for 2.5 minutes at 100 × g. Collect the flow-through fraction into the same F1 collection tube.

6 **Wash and collect additional flow-through fraction F2.** Place spin cartridge into a new collection tube labeled "Flow-through 2" or "F2". Add 400 µL of Buffer A to the top of the resin bed and

**NOTE**
If centrifuge cannot be programmed to 100 x g, then cartridge capacity may be different for use; the optimum results for depletion are obtained when the flow rate is controlled to < 0.2 mL/min.
centrifuge for 2.5 minutes at 100 x g. Collect the flow-through fraction into the F2 collection tube.

7 **Prepare for elution.** Remove the spin cartridge from the F2 collection tube and attach Luer-Lock adapter to the cartridge top.

8 **Elute bound fraction.** Fill a 5-mL plastic Luer-Lock syringe (labeled "B") with 2.5 mL of Buffer B and attach to the spin cartridge via the Luer-Lock adapter. Elute bound high-abundant proteins into a new collection tube by slowly pushing Buffer B through the spin cartridge. Save the bound fraction for analysis if desired, or discard it. Do not push air through the spin cartridge and do not allow the resin bed or frits to run dry.

9 **Re-equilibrate.** Remove Buffer B syringe and attach a 5-mL syringe (labeled "A") containing 5 mL of Buffer A to the spin cartridge. Re-equilibrate the spin cartridge by slowly pushing Buffer A through the resin bed. Do not allow the resin bed or frits to run dry by leaving a small aliquot of buffer on the top of the frit. The spin

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**NOTE** If the meniscus of Buffer B does not reach the top frit after depressing the syringe plunger completely, remove syringe and draw the plunger back to the 1-mL mark with air and reattach to the cartridge. Use the air in the syringe as positive pressure to push Buffer B through until the meniscus of Buffer B reaches the top frit.
The cartridge is ready for the next sample. For storage, leave the resin bed wet with Buffer A, and leave a layer of Buffer A above the top frit. Recap both ends of the spin cartridge tightly.

**NOTE**
Be careful when placing the plug in lower end of the spin cartridge; it must not displace or puncture the lower frit. Store spin cartridge in Buffer A in a refrigerator at 2–8 °C (35–46 °F). **DO NOT FREEZE THE SPIN CARTRIDGE.**

10 **Analyze.** Analyze separately or combine flow-through fractions F1 and F2 containing the low-abundant proteins. For 1D-SDS-PAGE, an aliquot of the flow-through fraction may be used directly. For IEF, 2DGE, and MS analysis of the flow-through fraction, it is necessary to buffer exchange/desalt to an appropriate buffer. The 5KDa MWCO spin concentrators (part number 5185-5991) may be used for buffer exchange and concentration. Alternatively, for automated desalting and concentration, the Agilent mRP C18 column (part number 5188-5231) may be used according to published methods (Agilent Technologies, publication 5989-2506EN).

**NOTE**
For maximum recovery of the flow-through protein combine and concentrate fractions F1 and F2.
Recommendations

- **Sample dilution**
  It is not recommended to load crude serum or plasma directly onto the spin cartridge. Follow instructions for serum/plasma dilution. Addition of protease inhibitors in Buffer A for sample dilution helps prevent protein degradation.

- **Sample cleanup**
  Human serum or plasma may contain particulate materials that can be removed by a quick spin using a 0.22-µm spin filter (part number 5185-5990).

- **Sample concentration**
  For further downstream proteomic analysis (SDS-PAGE or LC/MS), combine flow-through fractions F1 and F2 and concentrate the samples. Spin concentrators with 5 KDa MWCO (part number 5185-5991) can be used to concentrate proteins before analysis. Alternatively, for automated desalting and concentration, the Agilent mRP-C18 column (part number 5188-5231) may be used according to published methods (Agilent Technologies, publication 5989-2506EN).

- **Bound fraction analysis**
  If you will be analyzing the bound fraction, perform a buffer exchange to phosphate-buffered saline (PBS) or to another buffer compatible with your analysis. Buffer B contains compounds that may interfere with some protein assays.
• **Cartridge rewetting**  
  If the resin bed becomes dry during cartridge centrifugation or syringe elution, attach a syringe with Buffer A to the spin cartridge via the Luer-Lock adapter and re-equilibrate the cartridge by passing Buffer A through it. This should not affect the spin cartridge performance.

• **Spin cartridge performance**  
  Human 14 Multiple Affinity Removal System Spin Cartridges should perform reproducibly for more than 200 runs under proper conditions. Buffers A and B are optimized to support cartridge performance and longevity. Agilent does not guarantee spin cartridge performance if other buffers are used. Do not expose cartridges to organic solvents (like alcohols, acetonitrile, etc.), strong oxidizers, acids, or reducing agents, and other protein denaturing agents.

• **Cartridge storage**  
  After equilibrating Multiple Affinity Removal System Spin Cartridges with Buffer A, always store them in a refrigerator at 2–8 °C (35–46 °F) when not in use to minimize loss in cartridge capacity.

• **Lyophilization of flow-through fractions**  
  Buffer exchange to a volatile buffer (for example, ammonium bicarbonate) is recommended prior to lyophilization due to high salt concentration in Buffer A.
# Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>No flow</td>
<td>The spin cartridge may be capped too tightly during centrifugation.</td>
<td>Remove or loosen cap during centrifugation.</td>
</tr>
<tr>
<td></td>
<td>Bubble under resin or frits.</td>
<td>Rewet with Buffer A (see Recommendations - Cartridge rewetting).</td>
</tr>
<tr>
<td>Incomplete flow</td>
<td>Centrifugation parameters need to be adjusted</td>
<td>Adjust centrifuge force and time to achieve ≤ 0.2-mL/min flow rates through spin cartridge during steps 3 through 5 of procedure.</td>
</tr>
<tr>
<td>No proteins in bound</td>
<td>Buffers A and B reversed</td>
<td>Re-equilibrate spin cartridge with Buffer A (step 8) and start over with correct buffer sequence.</td>
</tr>
<tr>
<td>Problem</td>
<td>Cause</td>
<td>Solution</td>
</tr>
<tr>
<td>---------</td>
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<td>----------</td>
</tr>
<tr>
<td>Break-through of high-abundant proteins in flow-through fractions F1 and F2</td>
<td>Exceeding cartridge serum/plasma capacity</td>
<td>Reduce serum/plasma load per sample.</td>
</tr>
<tr>
<td>Serum/plasma protein levels may be unusually high</td>
<td>Reduce serum/plasma load per sample.</td>
<td></td>
</tr>
<tr>
<td>Flow rate through cartridge during sample loading too high</td>
<td>Reduce centrifugation force and/or time during sample loading to not exceed 0.2 mL/min flow rate.</td>
<td></td>
</tr>
</tbody>
</table>
Cartridge Specifications

<table>
<thead>
<tr>
<th>Part number 5188-6560</th>
<th>0.45-mL Multiple Affinity Removal System Cartridge, 1 each</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cartridge body material</td>
<td>Polypropylene</td>
</tr>
<tr>
<td>Frit materials</td>
<td>Polyethylene with 10-µm pore size</td>
</tr>
<tr>
<td>Cartridge capacity*</td>
<td>8–10 µL human serum/plasma</td>
</tr>
<tr>
<td>Recommended centrifugal force</td>
<td>100 x g</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>18–25 °C</td>
</tr>
<tr>
<td>Cartridge packing material</td>
<td>Affinity resin</td>
</tr>
<tr>
<td>Immobilized ligands</td>
<td>Affinity ligands to human albumin, IgG, antitrypsin, IgA, transferrin, haptoglobin, fibrinogen, alpha2-macroglobulin, alpha1-acid glycoprotein, IgM, apolipoprotein A1, apolipoprotein AII, complement C3, and transthyretin</td>
</tr>
<tr>
<td>Shipping solution</td>
<td>Buffer A with 0.02% sodium azide</td>
</tr>
<tr>
<td>Shipping temperature</td>
<td>2–8 °C (35–46 °F)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>2–8 °C (35–46 °F)</td>
</tr>
</tbody>
</table>

* For exact cartridge capacity, consult your cartridge certificate of analysis.
Storage: Store the affinity cartridge at 2–8 °C (35–46 °F) upon receiving and when not in use. DO NOT FREEZE THE CARTRIDGE! Store cartridge wetted with Buffer A and with the end-caps tightly sealed.

**CAUTION**
Do not expose cartridges to organic solvents (like alcohols, acetonitrile, etc.), strong oxidizers, acids, or reducing agents, and other protein denaturing agents.

**WARNING**
For RESEARCH USE ONLY. This product is NOT TO BE USED AS AN IN-VITRO DIAGNOSTIC.
Safety Issues

When preparing biological samples using Agilent Human 14 Multiple Affinity Removal System Spin Cartridges, follow general guidelines for handling biological materials and wear protective eyewear and gloves.

Related Agilent Products

Other related Agilent products include the following:

5188-6557  Agilent Multiple Affinity Removal System Column Hu-14, 4.6 X 50 mm, LC column that depletes 14 high-abundant proteins (albumin, IgG, IgA, transferrin, haptoglobin, antitrypsin, fibrinogen, alpha2-macroglobulin, alpha1-acid glycoprotein, IgM, apolipoprotein A1, apolipoprotein AII, complement C3, and transthyretin ) from human serum/plasma samples, 20 µL serum/plasma capacity per injection
5188-6558 Agilent Multiple Affinity Removal System Column Hu-14, 4.6 X 100 mm, LC column that depletes 14 high-abundant proteins (albumin, IgG, IgA, transferrin, haptoglobin, antitrypsin, fibrinogen, alpha2-macroglobulin, alpha1-acid glycoprotein, IgM, apolipoprotein AI, apolipoprotein AII, complement C3, and transthyretin) from human serum/plasma samples, 40 µL serum/plasma capacity per injection

5188-6559 Agilent Multiple Affinity Removal System Column Hu-14, 10 X 100 mm, LC column that depletes 14 high-abundant proteins (albumin, IgG, IgA, transferrin, haptoglobin, antitrypsin, fibrinogen, alpha2-macroglobulin, alpha1-acid glycoprotein, IgM, apolipoprotein AI, apolipoprotein AII, complement C3, and transthyretin) from human serum/plasma samples, 250 µL serum/plasma capacity per injection

5188-6409 Agilent High Capacity Multiple Affinity Removal System Column Hu-7HC, 4.6 X 50 mm, LC column that depletes seven high-abundant proteins (albumin, IgG, IgA, transferrin, haptoglobin, antitrypsin, and fibrinogen) from human serum/plasma samples, 30–35 µL serum/plasma capacity per injection
5188-6410 Agilent High Capacity Multiple Affinity Removal System Column Hu-7HC, 4.6 X 100 mm, LC column that depletes seven high-abundant proteins (albumin, IgG, IgA, transferrin, haptoglobin, antitrypsin, and fibrinogen) from human serum/plasma samples, 60–70 µL serum/plasma capacity per injection

5188-6411 Agilent High Capacity Multiple Affinity Removal System Column Hu-7HC, 10 X 100 mm, LC column that depletes seven high-abundant proteins (albumin, IgG, IgA, transferrin, haptoglobin, antitrypsin, and fibrinogen) from human serum/plasma samples, 250–300 µL serum/plasma capacity per injection

5188-6408 Agilent High Capacity Multiple Affinity Removal System Spin Cartridge Hu-7HC, spin cartridge that depletes seven high-abundant proteins (albumin, IgG, IgA, transferrin, haptoglobin, antitrypsin, and fibrinogen) from human serum/plasma samples, 12–14 µL serum/plasma capacity per use

5188-5332 Agilent High Capacity Multiple Affinity Removal System Column Hu-6HC, 4.6 X 50 mm, LC column that depletes six high-abundant proteins (albumin, IgG, IgA, transferrin, haptoglobin, and antitrypsin) from human serum/plasma samples, 30–40 µL serum/plasma capacity per injection
<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>5188-5333</td>
<td>Agilent High Capacity Multiple Affinity Removal System Column Hu-6HC, 4.6 x 100 mm</td>
<td>LC column that depletes six high-abundant proteins (albumin, IgG, IgA, transferrin, haptoglobin, and antitrypsin) from human serum/plasma samples, 60–80 µL serum/plasma capacity per injection</td>
</tr>
<tr>
<td>5188-5336</td>
<td>Agilent High Capacity Multiple Affinity Removal System Column Hu-6HC, 10 x 100 mm</td>
<td>LC column that depletes six high-abundant proteins (albumin, IgG, IgA, transferrin, haptoglobin, and antitrypsin) from human serum/plasma samples, 300–325 µL serum/plasma capacity per injection</td>
</tr>
<tr>
<td>5188-5341</td>
<td>Agilent High Capacity Multiple Affinity Removal System Spin Cartridge Hu-6HC, spin cartridge</td>
<td>that depletes six high-abundant proteins (albumin, IgG, IgA, transferrin, haptoglobin, and antitrypsin) from human serum/plasma samples, 14–16 µL serum/plasma capacity per use</td>
</tr>
<tr>
<td>5185-5984</td>
<td>Multiple Affinity Removal System Column Hu-6, 4.6 x 50 mm</td>
<td>LC column that depletes six high-abundant proteins (albumin, IgG, IgA, transferrin, haptoglobin, and antitrypsin) from human serum/plasma samples, 15–20 µL serum/plasma capacity per injection</td>
</tr>
</tbody>
</table>
Multiple Affinity Removal System Column Hu-6, 4.6 × 100 mm, LC column that depletes six high-abundant proteins (albumin, IgG, IgA, transferrin, haptoglobin, and antitrypsin) from human serum/plasma samples, 30–40 µL serum/plasma capacity per injection

Multiple Affinity Removal System Column Hu-6, 10 × 100 mm, LC column that depletes six high-abundant proteins (albumin, IgG, IgA, transferrin, haptoglobin, and antitrypsin) from human serum/plasma samples, 140–190 µL serum/plasma capacity per injection

Multiple Affinity Removal System Spin Cartridge Hu-6, spin cartridge that depletes six high-abundant proteins (albumin, IgG, IgA, transferrin, haptoglobin, and antitrypsin) from human serum/plasma samples, 7–10 µL serum/plasma capacity per use

Multiple Affinity Removal System Column Ms-3, 4.6 × 50 mm, LC column that depletes three high-abundant proteins (albumin, IgG, and transferrin) from mouse serum/plasma samples, 37–50 µL serum/plasma capacity per injection

Multiple Affinity Removal System Column Ms-3, 4.6 × 100 mm, LC column that depletes three high-abundant proteins (albumin, IgG, and transferrin) from mouse serum/plasma, 75–100 µL serum/plasma capacity per injection
5188-5289 Multiple Affinity Removal System Spin Cartridge Ms-3, spin cartridge that depletes three high-abundant proteins (albumin, IgG, and transferrin) from mouse serum/plasma samples, 25–30 µL serum/plasma capacity per use.

5185-5986 Multiple Affinity Removal System Reagent Kit, starter reagent kit containing buffers, spin filters, and spin concentrators for use with Multiple Affinity Removal System LC Columns.

5188-5254 Starter Reagent Kit for Spin Cartridges*
Buffer A: 1 L
Buffer B: 1 L
Spin filters 0.22 µm: 2 packs of 25
Protein concentrators: 1 pack of 25
Luer-Lock adapters: 1 pack of 2
5-mL plastic Luer-Lock syringes: 1 pack of 2
1.5-mL microtubes: 6 packs of 100
Spin cartridge extra caps and plugs, 1 pack of 25 each
Teflon Luer-Lock needles, 1 pack of 10

5188-5231 mRP-C18 High Recovery Protein Fractionation and Desalting Column, see www.agilent.com/chem/bioreagents for more details.

* Under normal conditions, the kit should last for approximately 200 spin cartridge uses.

For more information or technical assistance, please call toll free: 1-800-227-9770 or visit our Web site at: www.agilent.com/chem/bioreagents.