Alkali-Tolerant Protein A AgaDex FF Affinity Resin

Performance Comparison

Overview

Alkali-Tolerant Protein A AgaDex FF Affinity Resin uses an engineered, alkali-tolerant recombinant Protein A ligand single-point coupled to 4% cross-linked agarose. It is designed for antibody capture processes that rely on sodium hydroxide cleaning. This summary compares its specifications and alkali stability with a widely used alkali-tolerant Protein A resin from a major supplier (Competitor C), and with our standard Protein A AgaDex FF resin.

Key Results

- Twice the binding capacity of the Competitor C resin: ≥60 vs ~30 mg human IgG/mL resin.
- About 89% of binding capacity retained after 50 h total exposure to 0.5 M NaOH, compared with about 64% for the Competitor C resin after 30 h.
- About 65% of binding capacity retained after 80 purification cycles with 0.5 M NaOH cleaning, and at least 95% after 200 cycles with 0.1 M NaOH.
- Stable IgG yield and low ligand leakage (3-5 ppm) over 110 purification cycles of bovine serum.

Specification Comparison

Parameter	Alkali-Tolerant Protein A AgaDex FF	Competitor C
Matrix	**Cross-linked 4% agarose**	Highly cross-linked agarose
Average particle size	**~90 µm**	~85 µm
Ligand	**Recombinant alkali-tolerant Protein A (E. coli), ≥6 mg/mL resin**	Recombinant Protein A (E. coli)
Dynamic binding capacity	**≥60 mg human IgG/mL resin**	~30 mg human IgG/mL resin
Maximum flow rate	**900 cm/h at 0.3 MPa**	500 cm/h
pH stability	**3-10 (working), 3-12 (short term)**	3-10 (working), 3-12 (CIP)
CIP conditions	**0.1-0.5 M NaOH**	0.1-0.5 M NaOH
Chemical stability	**Common aqueous buffers; 0.1-0.5 M NaOH (CIP); 6 M guanidine HCl; 70% ethanol (CIP)**	Common aqueous buffers; 10 mM NaOH; 0.1 M sodium citrate/HCl (pH 3); 6 M guanidine HCl; 8 M urea; 20% ethanol; 2% benzyl alcohol
Temperature stability	**2-50 °C**	2-40 °C
Storage	**20% ethanol, 2-8 °C**	20% ethanol, 2-8 °C
Shelf life	**3 years**	Not stated

Data for Alkali-Tolerant Protein A AgaDex FF are provided by the resin manufacturer. Competitor C specifications are based on publicly available information and may change. For research use only.

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Alkali Stability

Stability Under Repeated NaOH Exposure

Binding capacity (DBC10%) was measured after repeated exposure to sodium hydroxide and is shown relative to the starting value.

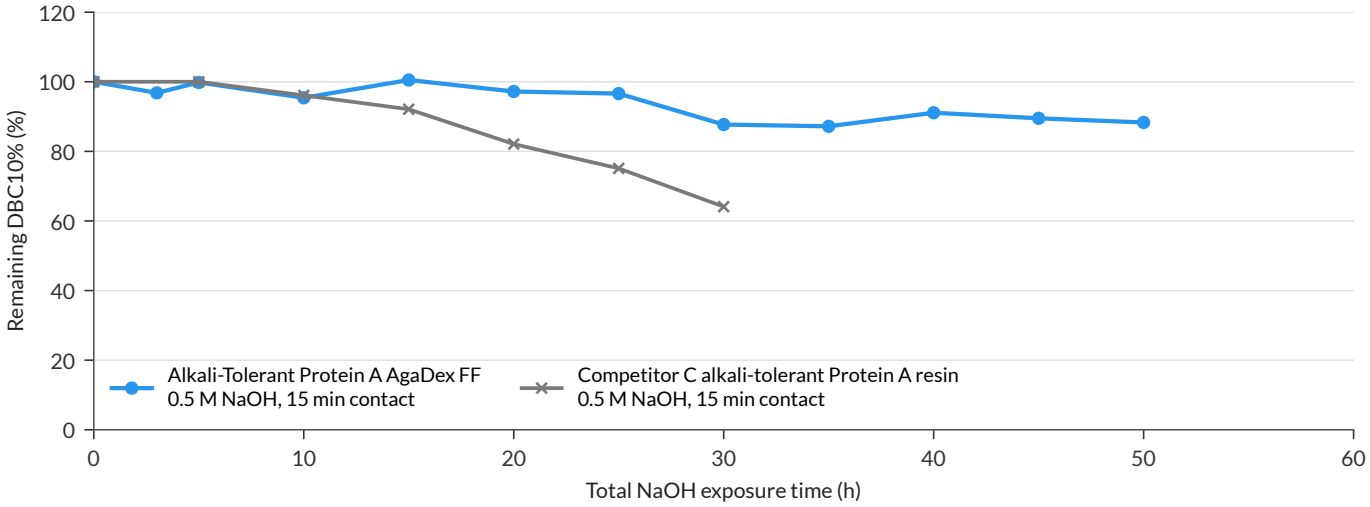


Figure 1. Alkali-Tolerant Protein A AgaDex FF compared with the Competitor C resin, both cleaned with 0.5 M NaOH (15 min contact per cycle). After 50 h total exposure the alkali-tolerant resin retained about 89% of its initial DBC, while the Competitor C resin fell to about 64% after 30 h.

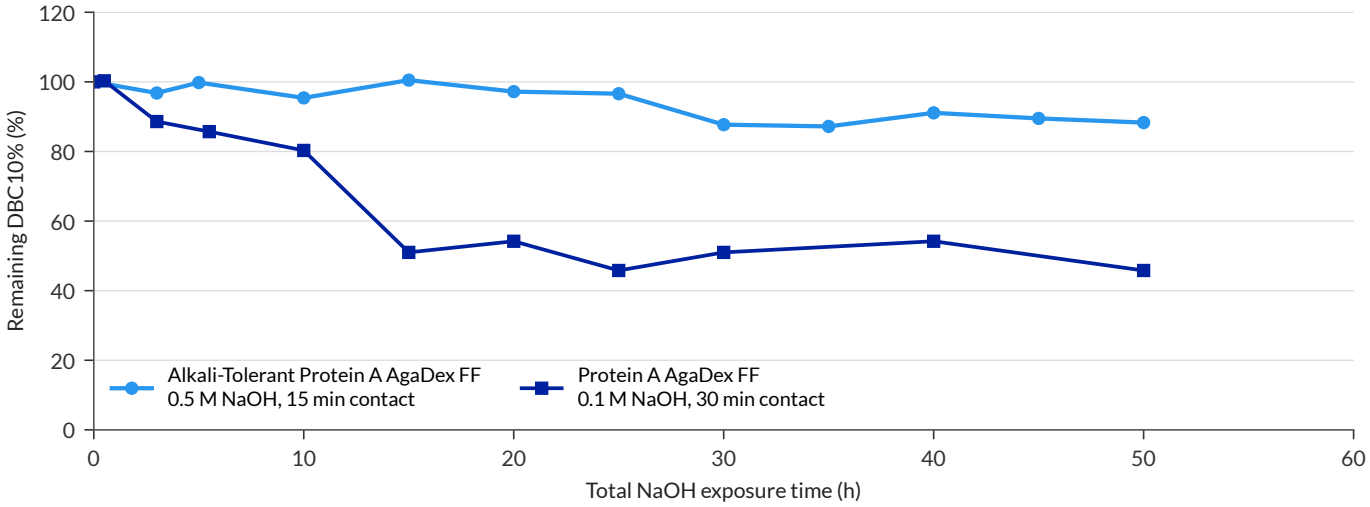


Figure 2. Alkali-Tolerant Protein A AgaDex FF (0.5 M NaOH, 15 min contact) compared with standard Protein A AgaDex FF (0.1 M NaOH, 30 min contact). Even with five times stronger NaOH, the alkali-tolerant resin kept about 89% of its DBC after 50 h, while the standard Protein A resin dropped to about 50% within 15 h.

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Cleaning Cycle Lifetime

Binding Capacity Over Repeated Purification Cycles

DBC10% was followed over repeated purification cycles, each including a cleaning-in-place (CIP) step.

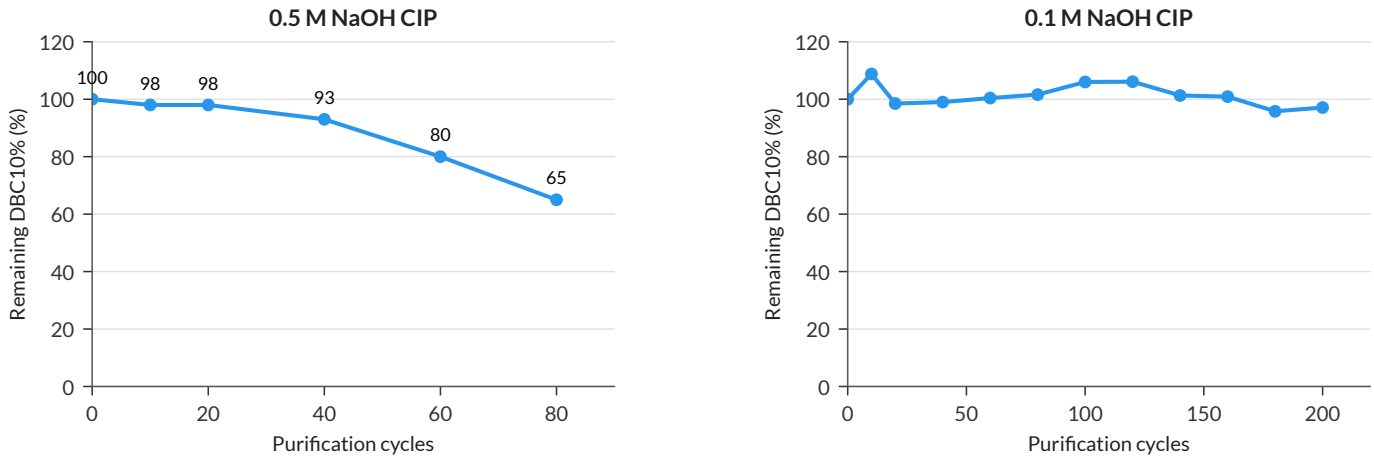


Figure 3. Left: 65% of the initial DBC remained after 80 cycles with 0.5 M NaOH CIP (10 CV); binding buffer 20 mM PB, 500 mM NaCl, pH 7.4; elution buffer 100 mM glycine, pH 3.0; sample: culture supernatant with added IgG (5 mL, 4 mg/mL IgG). Right: at least 95% of the initial DBC remained after 200 cycles with 0.1 M NaOH CIP.

Application: IgG Purification from Bovine Serum

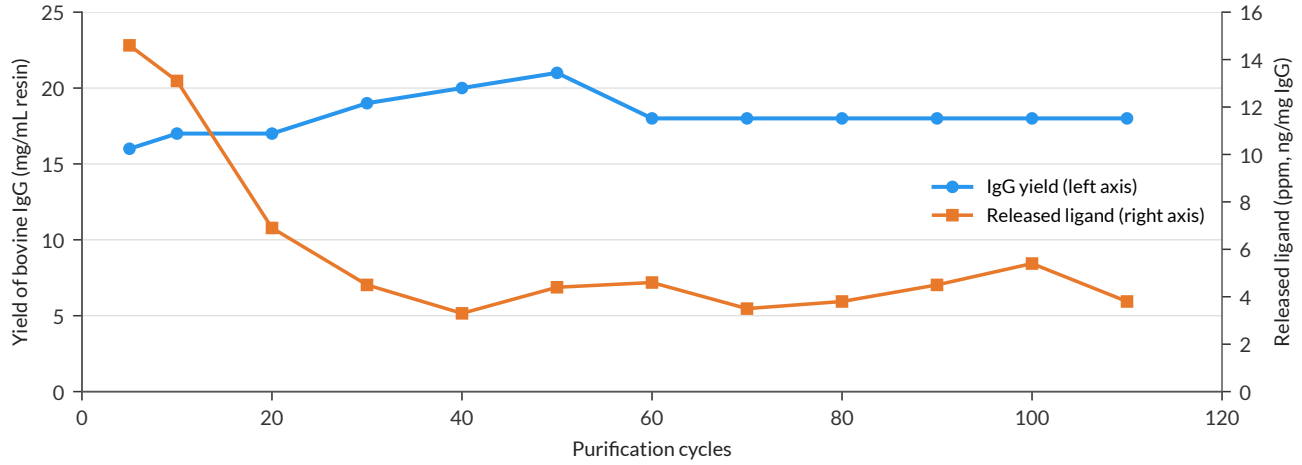


Figure 4. IgG yield and released ligand over 110 purification cycles of bovine serum on a pre-packed column. IgG yield stayed between 16 and 21 mg/mL resin, and ligand leakage fell from about 15 ppm in the first cycles to 3-5 ppm. Binding buffer 20 mM PB, 150 mM NaCl, pH 7.4 (10 CV); elution buffer 100 mM glycine, pH 3.0 (14 CV); CIP 100 mM NaOH (10 CV).

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