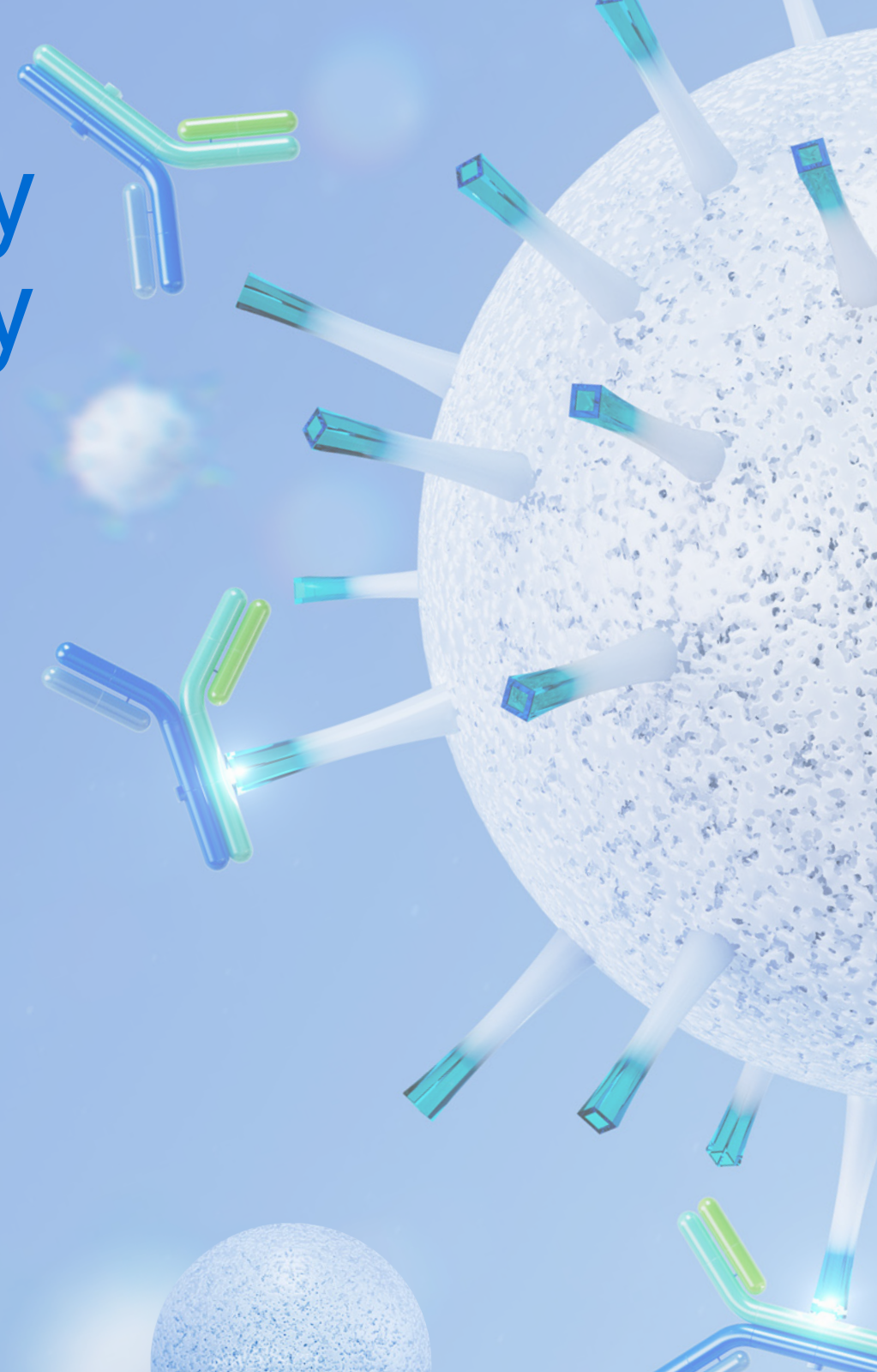
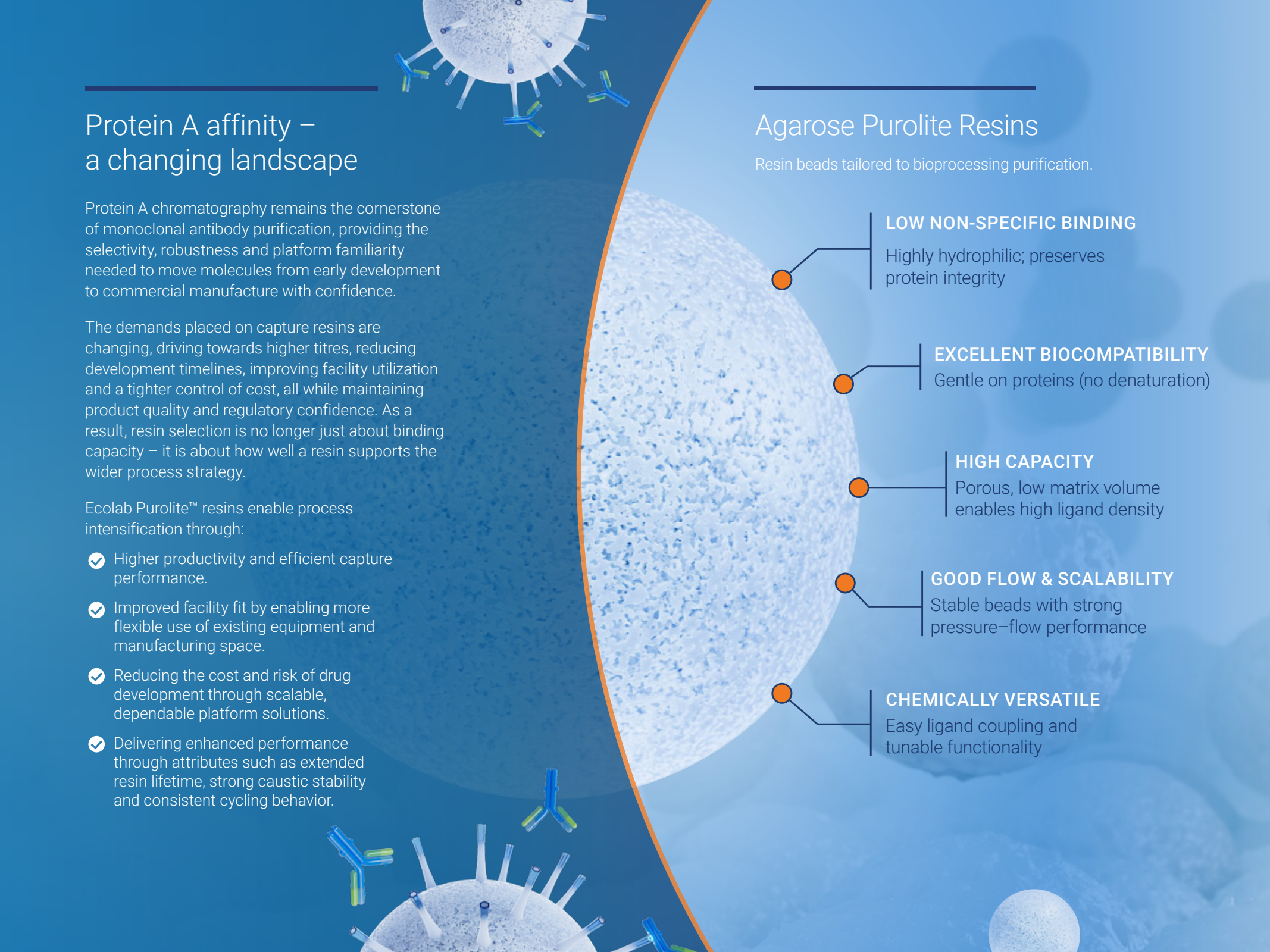


# Protein A Affinity Chromatography Resins for Monoclonal Antibody Purification

**ECOLAB®**





## Protein A affinity – a changing landscape

Protein A chromatography remains the cornerstone of monoclonal antibody purification, providing the selectivity, robustness and platform familiarity needed to move molecules from early development to commercial manufacture with confidence.

The demands placed on capture resins are changing, driving towards higher titres, reducing development timelines, improving facility utilization and a tighter control of cost, all while maintaining product quality and regulatory confidence. As a result, resin selection is no longer just about binding capacity – it is about how well a resin supports the wider process strategy.

Ecolab Purolite™ resins enable process intensification through:

- ✓ Higher productivity and efficient capture performance.
- ✓ Improved facility fit by enabling more flexible use of existing equipment and manufacturing space.
- ✓ Reducing the cost and risk of drug development through scalable, dependable platform solutions.
- ✓ Delivering enhanced performance through attributes such as extended resin lifetime, strong caustic stability and consistent cycling behavior.

## Agarose Purolite Resins

Resin beads tailored to bioprocessing purification.

### LOW NON-SPECIFIC BINDING

Highly hydrophilic; preserves protein integrity

### EXCELLENT BIOCOMPATIBILITY

Gentle on proteins (no denaturation)

### HIGH CAPACITY

Porous, low matrix volume enables high ligand density

### GOOD FLOW & SCALABILITY

Stable beads with strong pressure-flow performance

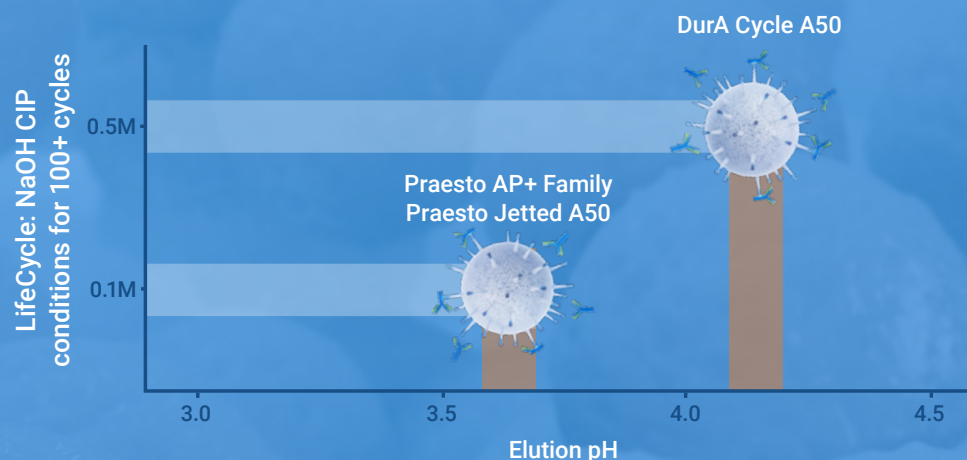
### CHEMICALLY VERSATILE

Easy ligand coupling and tunable functionality

## The Ecolab Approach to Protein A Affinity Resins

Ecolab Life Sciences produces a range of protein-A based affinity resins for the purification of monoclonal antibodies. Ecolab initially developed and released a baseline resin, Praesto™ Jetted A50, a traditional protein A that covers many monoclonal antibody applications.

The protein A ligand has subsequently been developed to produce two further protein A based resins that extend the capabilities of the technology, to cover different approaches to antibody purification.



Through careful engineering, Ecolab offers a range of Protein A resins with characteristics suited to different applications.



### FACILITY FIT

#### 50µm vs. 80µm Particle Size

The standard particle size of Ecolab's protein A affinity resins is 50µm, coupling high dynamic binding capacity with good flow properties. However, our resins designed specifically with facility fit into legacy workflows in mind are also available in an 80µm particle size to allow seamless transition.



### PRODUCTIVITY

#### Lifetime vs. Cost

Productivity in purification can be achieved in two ways – by increasing the lifetime of the resin so that more production cycles can be performed, or reducing the cost of the resin so that the cost per cycle is minimized. Ecolab offers resin in both classes to suit the requirements of individual workflows.



### RECOVERY

#### Standard vs. Mild pH Elution

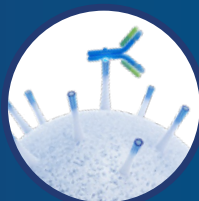
In many instances the low pH required for elution of monoclonal antibodies from protein A is perfectly suitable. However, in some situations better recovery of product is achieved with milder elution pH. Ecolab has products that facilitate standard or mild pH elution as required.

# Affinity Resins for mAb Purification

Three Distinct Product Line Offerings

## 1 NEXT GEN DurA Cycle A50

- High Dynamic Binding Capacity (DBC) performance
- Robust caustic stability
- Improves manufacturing efficiencies



### NEXT-GENERATION PERFORMANCE ENHANCED RESIN

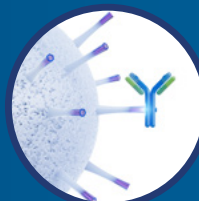
#### DurA Cycle A50

DurA Cycle A50 is a modern protein A resin engineered for enhanced stability and mild antibody processing.

- ✓ 50µm agarose bead for maximized capacity and good flow properties
- ✓ High stability designed into the DurA Cycle ligand to maximize the number of cycles and reduce column downtime
- ✓ Mild pH elution compared to traditional protein A reduces aggregation risk and damage to acid-labile molecules
- ✓ Increase in viral clearance achieved at milder pH

## 2 TARGETED Praesto AP+50 & AP+80

- Optimized DBC performance
- Optimized for flowrate
- Supports facility fit



### PROTEIN A RESIN OPTIMIZED FOR PRODUCTIVITY IN ESTABLISHED PROCESSES

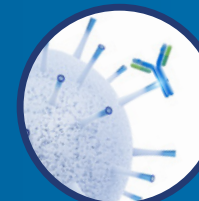
#### Praesto AP+50 & AP+80

The Praesto AP+ family of resins is designed to reduce the burden of resin costs and slot seamlessly into established workflows.

- ✓ 50µm agarose bead for maximized capacity and good flow properties
- ✓ 80µm agarose bead for good capacity and maximized flow properties
- ✓ Designed to offer improved cost of goods per cycle to reduce impact of resin pricing on therapies
- ✓ 80µm bead offers straightforward replacement for legacy resins with little impact on infrastructure

## 3 PROVEN Praesto Jetted A50

- Optimized for commercial processes
- Intensified processing
- Jetted consistency



### ESTABLISHED BASELINE RESIN

#### Praesto Jetted A50

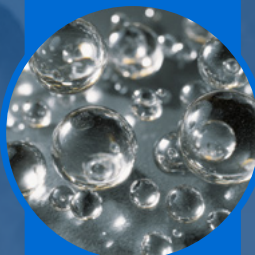
Praesto Jetted A50 standard protein A affinity resin used in commercial monoclonal antibody production.

- ✓ 50µm agarose bead for maximized capacity and good flow properties
- ✓ Traditional protein A binding
- ✓ Implemented in commercial drug production by leading pharmaceutical companies

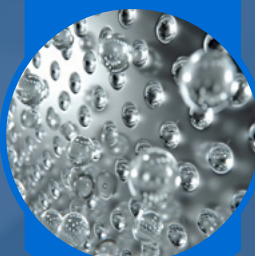
JETTING IS A **PATENTED** AND **ENHANCED** MANUFACTURING PROCESS THAT STREAMLINES PRODUCTION STEPS

How do manufacturing techniques differ?

Batch Emulsification  
(Legacy manufacturing technique)



Patented Jetted Manufacturing



## Addressing Antibody Purification – Ecolab's Purolite Resins

Ecolab's range of resins for the bioprocessing industry are produced by a patented jetting process resulting in uniform beads. The outcome is excellent capacity, flow and packing properties, coupled with sustainability benefits when compared to traditional emulsification techniques.



Reduced raw materials consumption



Shortened lead time



Increased product consistency



Reduction in production steps



Increased efficiency



Reduction of inorganic solvents

## The Benefits of Jetted Resin Manufacturing

## Complementary Products

### Complex Affinity Portfolio



#### PRAESTO™ JETTED A50 HIPH

Offers a wider pH elution window to limit aggregation and increase purity.



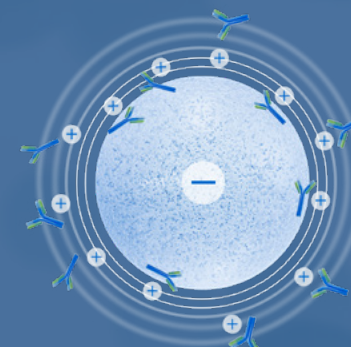
#### PRAESTO™ 70 CH1

Targets CH1 antibody domains, simplifying complex purifications.

### Ion Exchange Portfolio

#### PRAESTO SP RESIN

A platform cation exchange resin for mAb polishing by either bind and elute or flow through chromatography.



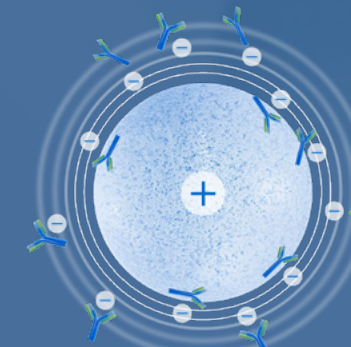
High capacity for effective process efficiency



Good cycle count

#### PRAESTO Q RESIN

A platform anion exchange resin for mAb polishing by either catch and release or flow through chromatography.



Optimal flow properties



Available from lab to process scale

Ecolab is a global developer, manufacturer, and supplier of Purolite™ Resins including ion exchange, catalyst adsorbent and advanced polymers that make the world cleaner and healthier.



[PuroliteResins.com](https://PuroliteResins.com)



## We're ready to solve your process challenges.

For further information on products and services, visit [PuroliteResins.com](https://PuroliteResins.com) or complete a Contact Us form via [PuroliteResins.com/contact-us](https://PuroliteResins.com/contact-us) or use the QR code.

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