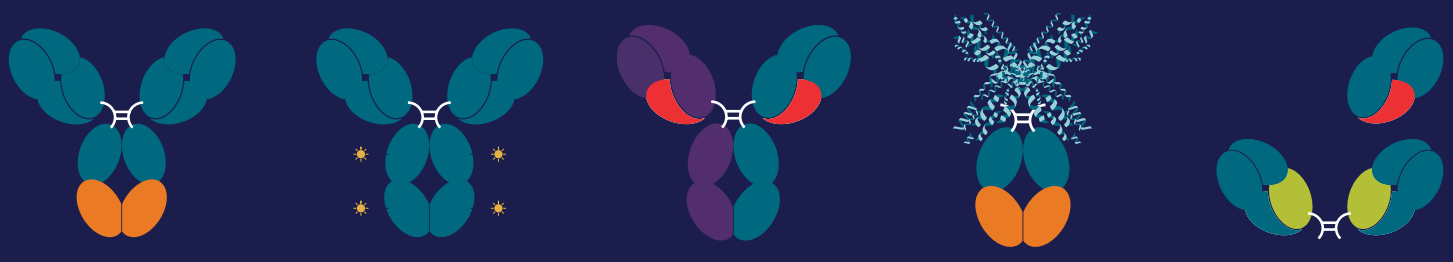
Antibody purification

Resolving 5 challenges of novel mAb purification

The diversity of new therapeutic monoclonal antibody (mAb) modalities brings potential to transform medicine with highly specific and efficient antigen targeting. However, added structural complexity can present purification challenges that conventional chromatography strategies can't address. **Thermo Scientific™ CaptureSelect™ affinity chromatography ligands** and **Thermo Scientific™ POROS™ chromatography resins** are designed to overcome these challenges to enable ample yield, high purity, and scalable mAb production.

Therapeutic mAb modalities



IgG | Antibody drug conjugates | Bi-specific antibodies | Fc-fusion proteins | Fab fragments

Top 5 purification challenges

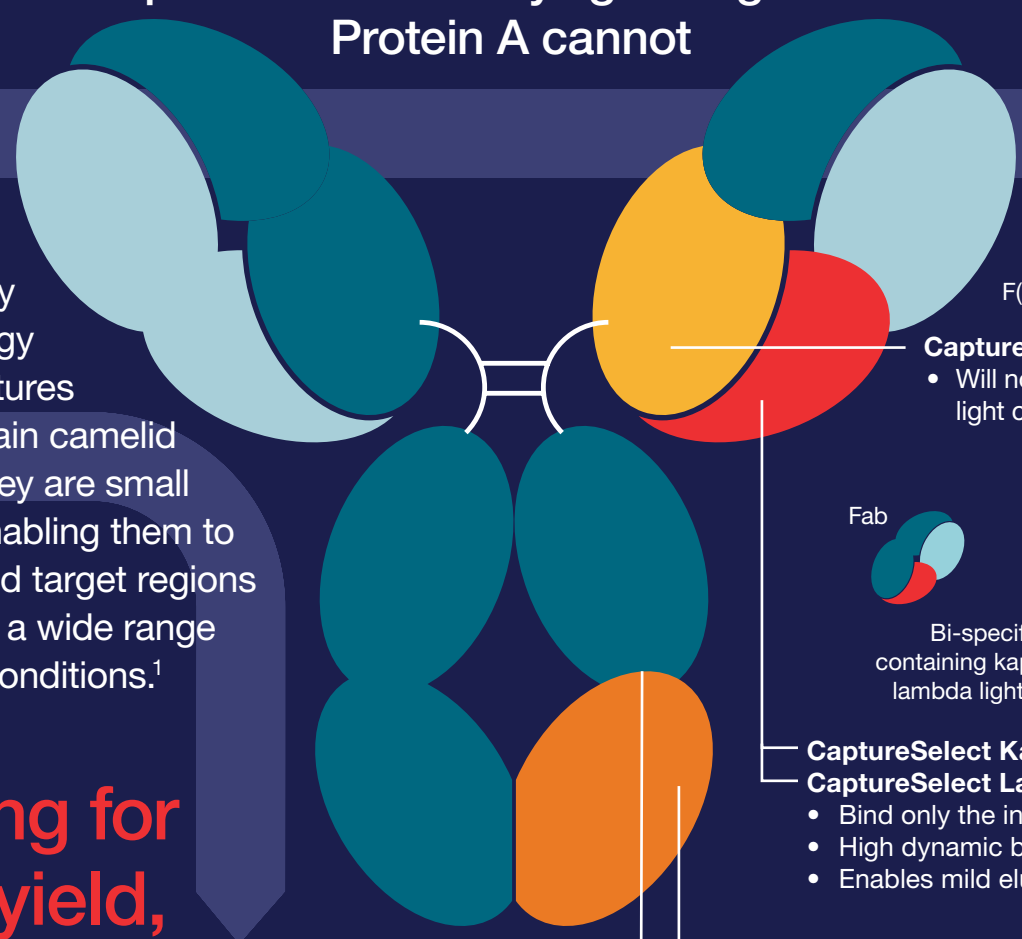
Modified mAb conformations may result in a wide range of product related impurities and physiochemical properties that may limit the efficacy of Protein A.

	1 **Target mAb** has absent or altered Fc region	**2** **Target mAb** is pH-sensitive	**3** **Culture medium** contains mAb dimers and aggregates	**4** **Culture medium** contains elevated levels of mixed molecular weight species	**5** **Culture medium** contains over-expressed light chains and light chain dimers
Impact on purification					
mAb affinity binding is impaired	●				●
mAb interaction with polishing matrices is impaired		●			
Competes with target mAb for matrix interaction			●	●	●
Aggregation or degradation of target mAb	●	●	●		●
Elevated sensitivity to binding and elution conditions		●			
Introduces workflow issues			●	●	

What to do when Protein A doesn't work?

CaptureSelect affinity ligands go where Protein A cannot

CaptureSelect agarose affinity resin technology harnesses features of single-domain camelid antibodies. They are small and robust, enabling them to reach obscured target regions and withstand a wide range of bind/elute conditions.[1]



Polishing for purity, yield, and scalability

POROS beads support all our mAb polishing resins. Their structural properties contribute to stable, high-throughput mAb purification.

50-micron beads – tight peaks and small elution volumes maximize resolution and purity

Large pores – high capacity and resolution independent of flow rate maximize yield, purity, and scalability

Chemically robust backbone – linearity and stringent cleaning maximize efficiency and scalability

POROS hydrophobic interaction (HIC), cation and anion exchange (IEX), and multi-mode resins remove:

- Host cell proteins (HCPs)
- Leached ligands
- mAb aggregates and fragments
- DNA
- Virus particles
- Product-related impurities

Master challenges with adaptable solutions and start-to-finish support

- Purify complex mAb isoforms at high specificity and stability
- Establish your mAb purification platform early for streamlined scale-up
- Work with us to develop solutions tailored for your specific mAb purification needs

Reference

1. Harmsen MM, De Haard HJ (2007). Properties, production, and applications of camelid single-domain antibody fragments. *Appl Microbiol Biotechnol* 77(1):13-22.

Explore workflow solutions thermofisher.com/antibody-therapeutics