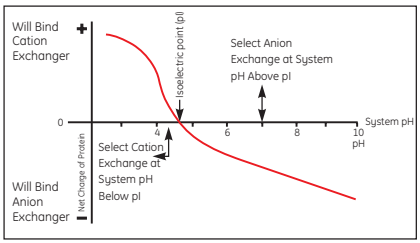
Selection Guide — Ion Exchange Media

Selecting an anion or cation exchanger

Ion exchange separates proteins on the basis of differences in their net surface charge in relation to pH of the surroundings. The figure here illustrates how the net charge of a protein can vary with pH. Every protein has its own charge/pH relationship.



If isoelectric point (pI) of the target protein is known:
- select an anion exchanger (Q, DEAE, ANX) with a buffer pH above the pI.
- select a cation exchanger (S, SP, CM) with a buffer pH below the pI.

If pI is unknown:
- test for selectivity using a strong ion exchanger, Q, S or SP. Strong ion exchangers maintain their charge over a wider pH range than weak ion exchangers and are suitable for most applications.

Polishing
Remove trace impurities or closely-related substances
Sample condition: almost pure

- **Highest resolution** µg/run
- **Highest resolution** mg/run
- **High resolution** High throughput Easy scale-up

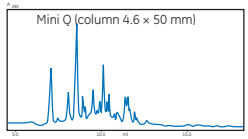
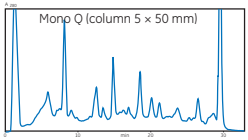
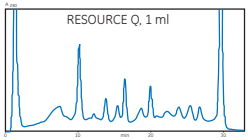
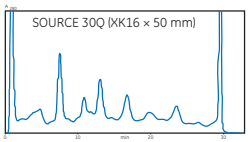
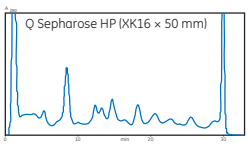
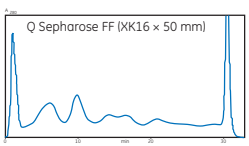
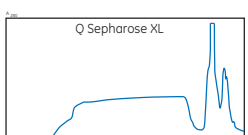
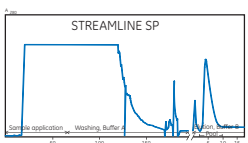
Intermediate purification
Remove bulk impurities
Sample condition: partially purified

- **High resolution** Easy scale-up
- Easy scale-up Broad choice of selectivity, including alternatives to Q or S ion exchange media

Capture
Isolate, concentrate and stabilize target protein(s)
Sample condition: clarified or non-clarified

- High volume through-put and high capacity Easy scale-up
- High binding capacity for selected proteins Easy scale-up
- Large scale, viscous samples
- Industrial scale, filtration and capture in one step

Start here

MiniBeads (Q or S)	Use for intermediate purification if column capacity is sufficient and no scale-up is required.	 Sample: Pancreatin Gradient elution
MonoBeads (Q or S)	Use for intermediate purification if column capacity is sufficient and no scale-up is required. Can be used for capture steps if sample is free from particulate matter.	 Sample: Pancreatin Gradient elution
SOURCE 15 (Q or S)	Use SOURCE 15 when resolution is top priority.	 Sample: Pancreatin Gradient elution
SOURCE 30 (Q or S)	Use SOURCE 30 when speed is top priority.	 Sample: Pancreatin Gradient elution
Sepharose High Performance (Q or SP)	Use HiTrap columns prepacked with Sepharose High Performance, Sepharose XL and Sepharose Fast Flow for media selection and pH scouting.	 Sample: Pancreatin Gradient elution
Sepharose Fast Flow (Q, SP, DEAE, CM, ANX)	Try weak ion exchangers such as DEAE, CM or ANX if the selectivity of Q or S is unsatisfactory.	 Sample: Pancreatin Gradient elution
Capto (Q, S, MMC)	Use high bed heights for increased productivity. Use MMC for high salt feed.	 Sample: Recombinant α-amylase Pilot scale: Gradient elution begins after 20 l
Sepharose XL (Q or SP)	Use Sepharose Q XL virus licensed as an alternative to cesium chloride gradients for purification of viruses, including adenovirus, or viral vectors.	
Sepharose Big Beads (Q or SP)	Use with step elution.	 Sample: Recombinant antigen binding fragment Pilot scale: Step elution
STREAMLINE™ (Q XL, SP XL, SP, DEAE, HST)	Use STREAMLINE for direct capture from unclarified feed-stock. Use HST, a salt tolerant adsorbent, to minimize dilution and reduce process time.	

Resolution