

Selection guide

Ion exchange chromatography columns and resins



Introduction to ion exchange chromatography

What is ion exchange (IEX) chromatography?

IEX is a liquid chromatography technique to separate proteins that have only slight differences in their net surface charge. Even very closely related proteins will have some difference in charge and can be effectively separated using this purification method.

The chromatography technique is based on the interaction of a charged molecule and the oppositely charged chromatography resin.

This chromatography technique takes advantage of the fact that the relationship between net surface charge and pH is unique for a specific protein.

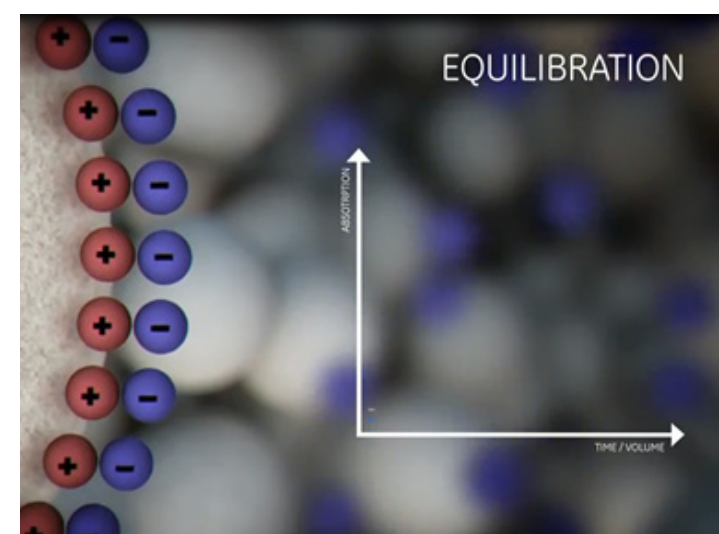
Typically, conditions are selected to ensure that the molecules of interest bind to the resin as they are loaded onto the column.

Conditions are then altered so that the bound substances are eluted differently.

IEX is performed in four main steps as shown below.

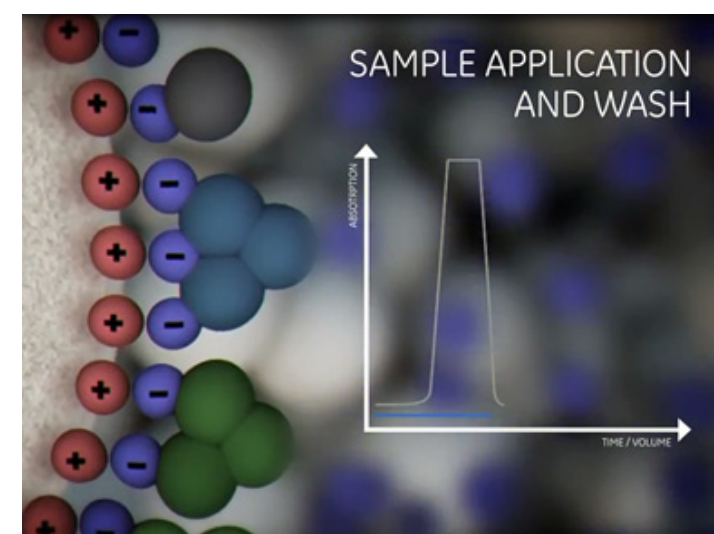
How does ion exchange chromatography work?

1. Equilibration



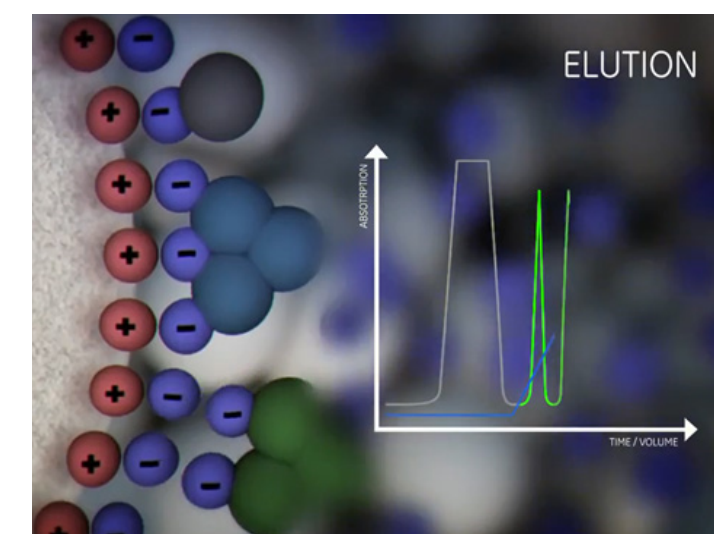
Prepare the column to the desired start conditions.

2. Sample application and wash



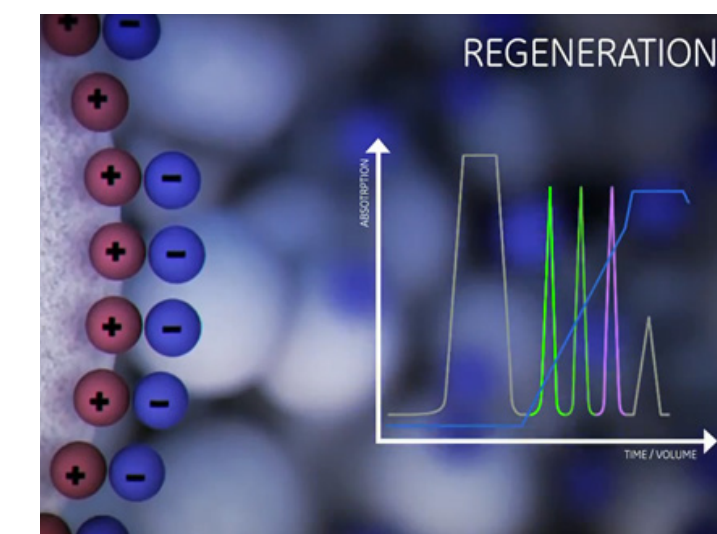
Bind the target molecules and wash out all unbound material.

3. Elution



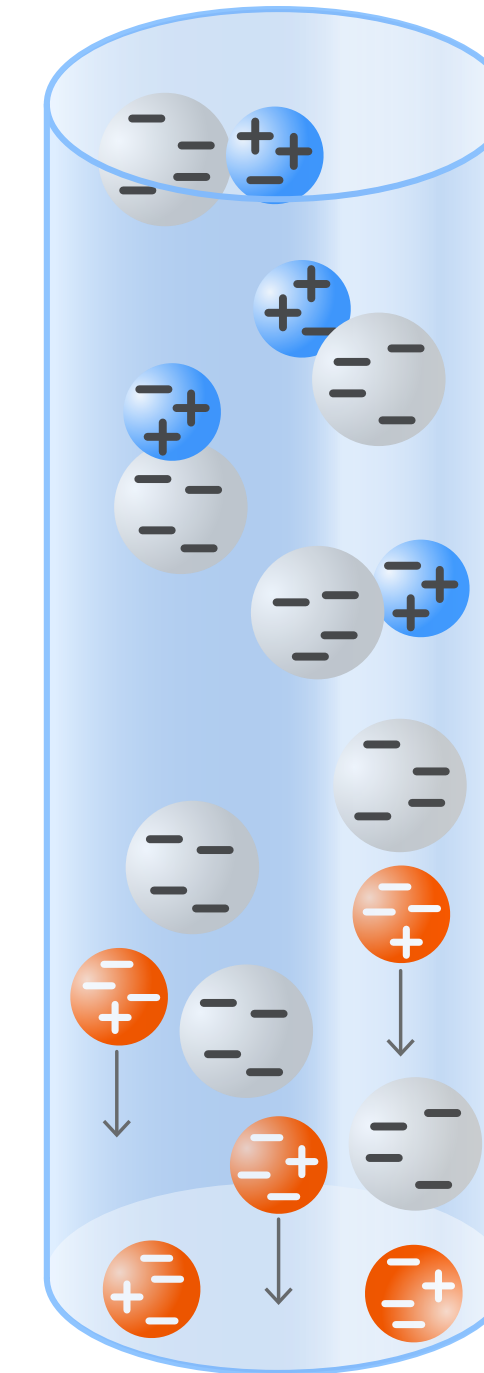
Biomolecules are gradually released from the ionic exchanger by a change in the buffer composition.

4. Regeneration



Removal of all molecules still bound.

Fig 2. Main steps of an ion exchange chromatography run.



Positively charged protein (blue) binds to negatively charged resin beads (gray)

Negatively charged protein (orange) flows through

Fig 1. Ion exchange chromatography using a cation exchanger.

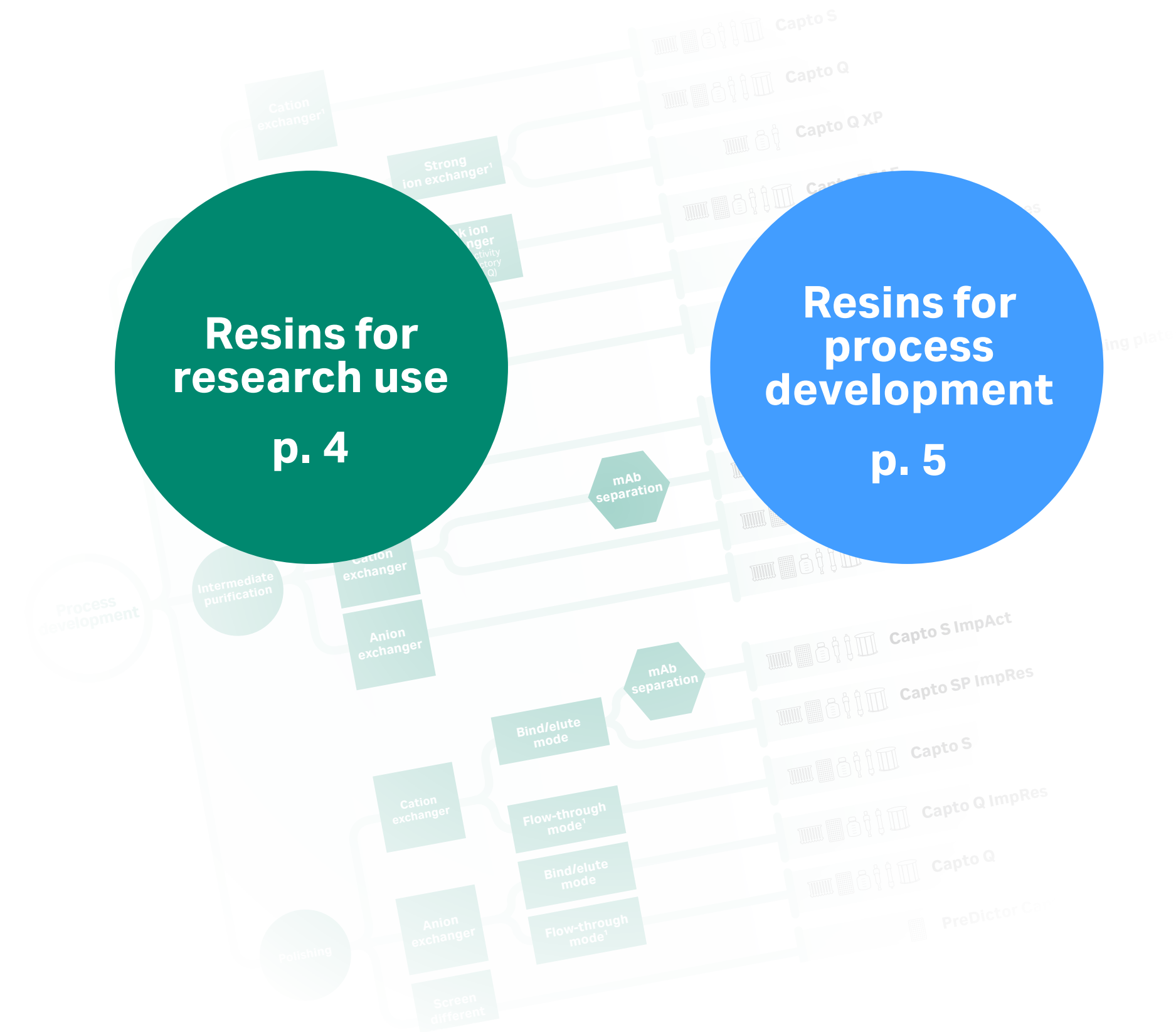
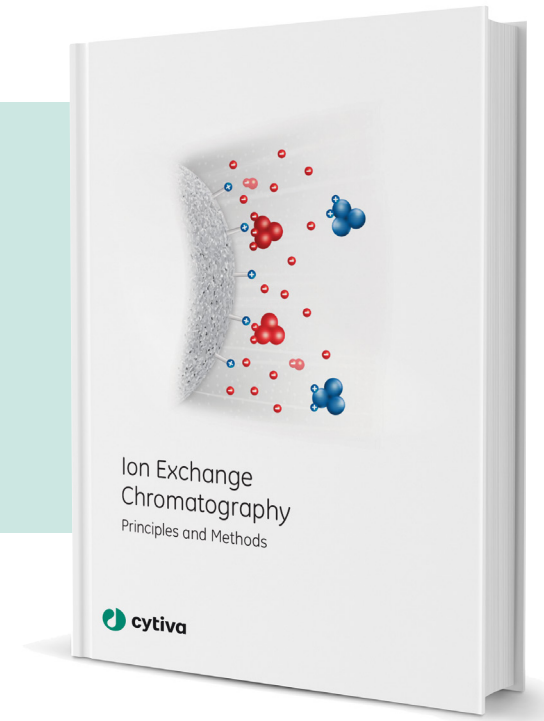
Select your ion exchange chromatography resin

Select the chromatography resin according to the objective of the purification step and the condition of the starting material. Other factors such as sample stability, scale, speed, binding capacity, and equipment available may also influence the final choice. Use the decision trees on pages 4 and 5 to find the most appropriate resin for your needs.

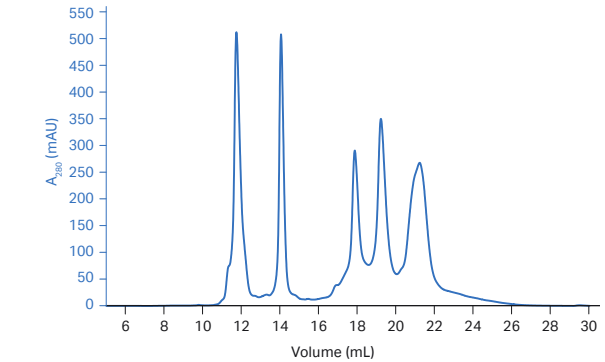
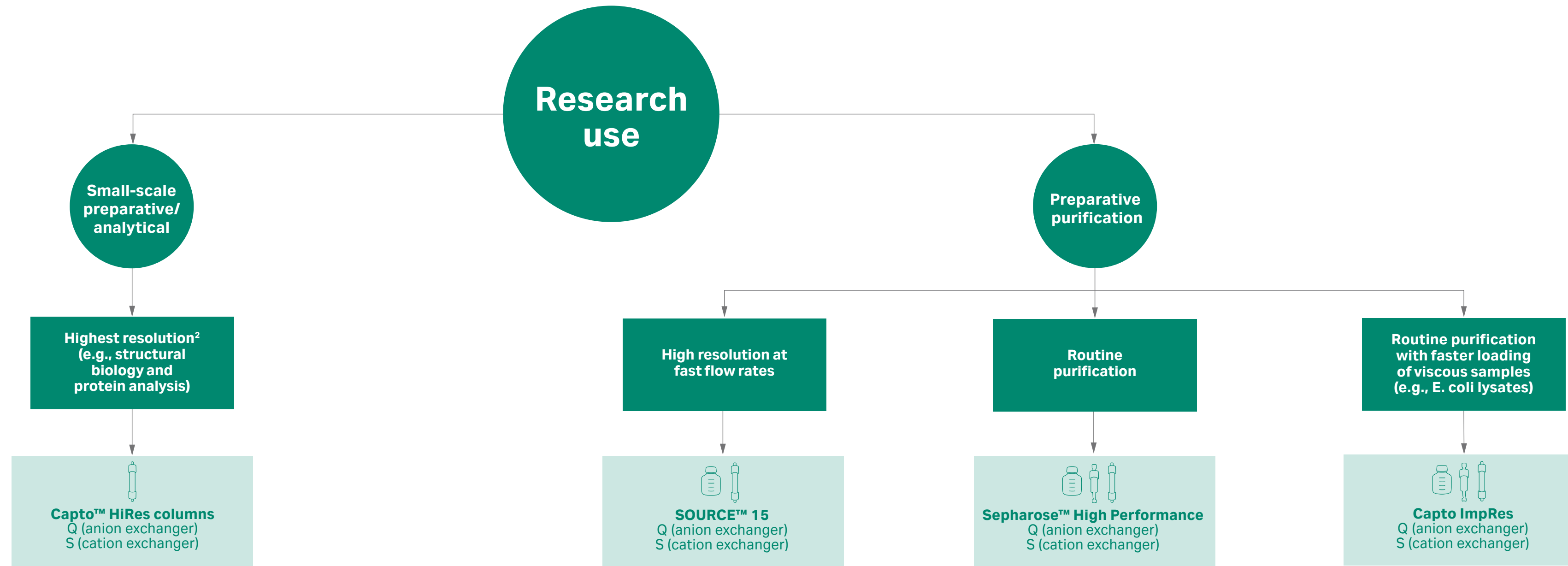
Ion exchange chromatography handbook

Looking for protocols and tips for using ion exchange chromatography?

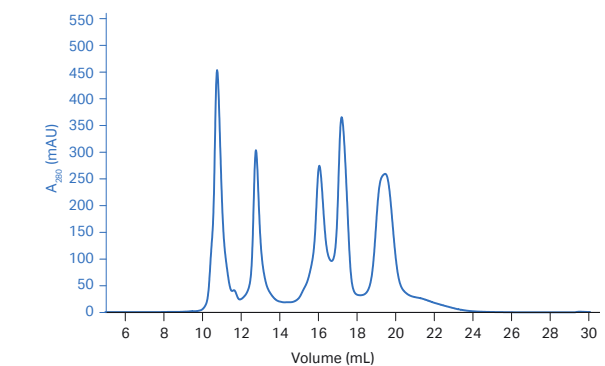
Download our handbook from [cytiva.com/handbooks](https://www.cytiva.com/handbooks)



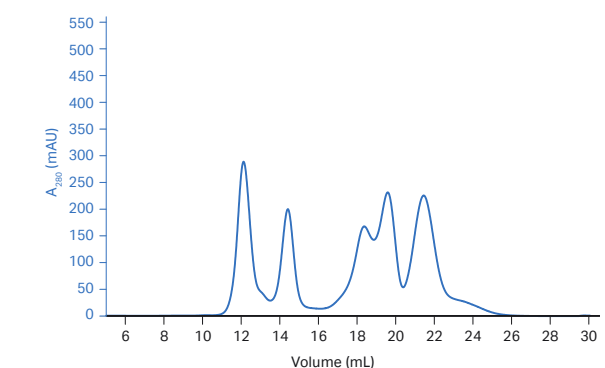
Guide to IEX resins for research applications¹



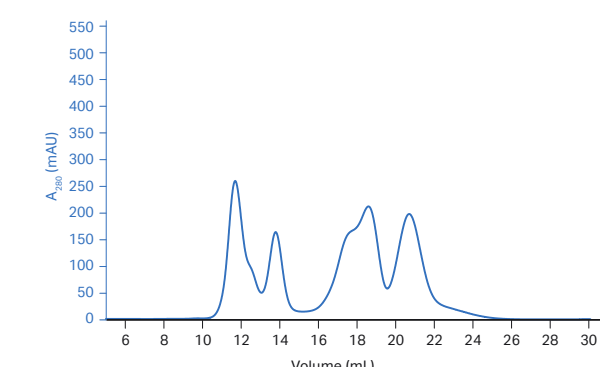
Separation³ on a Capto HiRes Q 5/50 column



Separation³ on a RESOURCE™ Q 1mL column (SOURCE 15 resin)






Separation³ on a HiTrap Q HP 1mL column (Sephacrose High Performance resin)



Separation³ on a HiTrap Capto Q ImpRes 1 mL column

Format guide

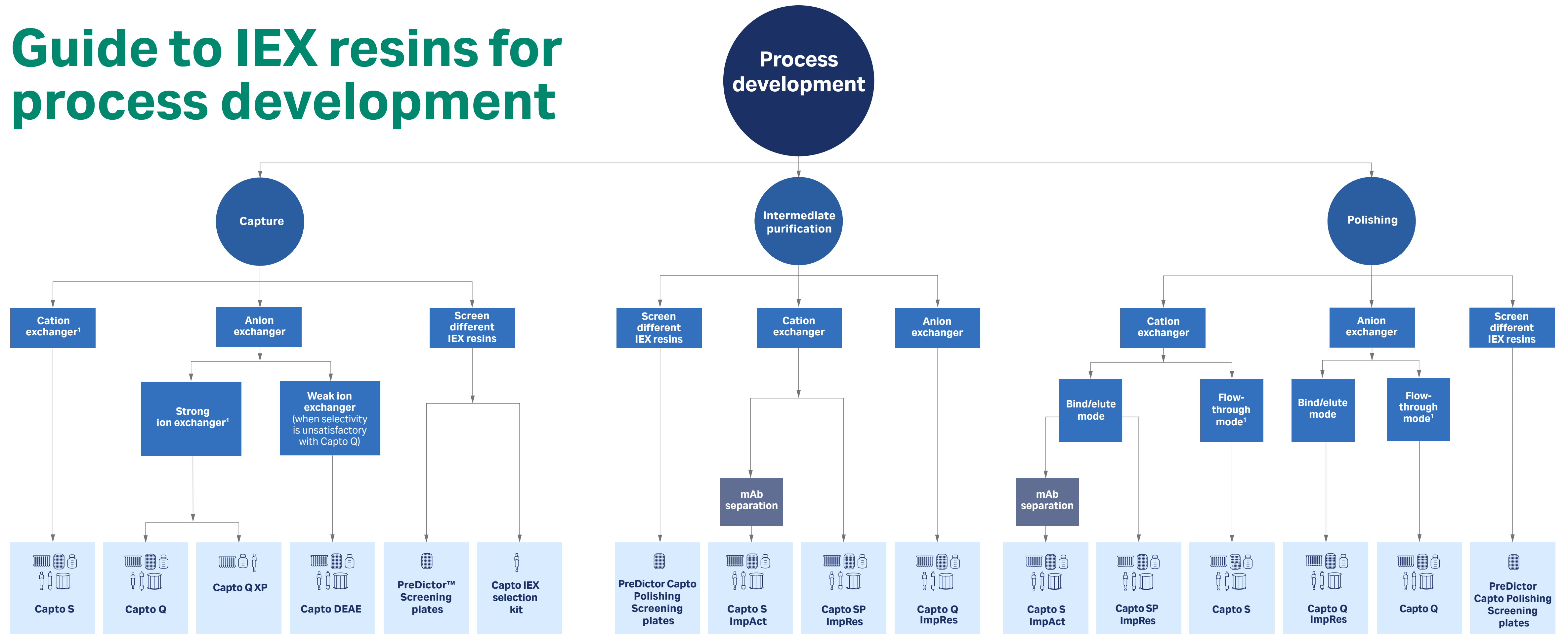
Type of purification	Manual or system purification		System purification	
Format	 Bottles of chromatography resins	 Small-column cartridges (1 and 5 mL)	 Other columns	
Format name	Lab pack	HiTrap™	HiScreen™, HiPrep™, RESOURCE, Tricorn™	
Use	Batch purification and packing empty columns	Easy to use with a syringe, peristaltic pump, or a chromatography system	Larger scale or high-performance applications	

¹ This resin selection is our recommendation for the most common needs in research. For a complete list of products, refer to the ordering information table

² Compared with other IEX columns from Cytiva

³ Protein mix purified at 1 mL/min and containing: Apotransferrin
α-Lactalbumin
β-Lactoglobulin
Amyloglucosidase

Guide to IEX resins for process development



Format guide

Format	96-well filter plates (2, 6, 20, or 50 µL)	Miniaturized prepacked columns (50, 200, and 600 µL)	Bottles of chromatography resins	Format	Prepacked columns (1 and 5 mL)	Prepacked columns (4.7 mL with 10 cm bed height)	Single-use, prepacked columns ≥ 1 L
Format name	PreDictor	PreDictor RoboColumn™	Bulk pack	Format name	HiTrap	HiScreen	ReadyToProcess™ ²
Application	High-throughput screening	High-throughput process development	Batch purification and self-packing	Application	Process development, screening	Method optimization	Clinical manufacturing

¹ We also offer solutions based on membrane adsorbers technology. Contact your sales representative.

² For more information about ReadyToProcess columns, contact your sales representative

Which ion exchanger should be used?

What is the pI of a protein?

The isoelectric point (pI) is the pH at which a protein has no net charge. A protein that has no net charge at a pH equivalent to its pI will not interact with a charged resin. However, at a pH above its pI, a protein will bind to a positively charged resin (anion exchanger). At a pH below its pI, a protein will bind to a negatively charged resin (cation exchanger, see Fig 3).

Guidance for ion exchanger selection

If isoelectric point (pI) of the target protein is known:

- Select an anion exchanger (Q, DEAE) 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:

Starting with a strong exchanger (Q, S, SP) is recommended.

Strong ion exchangers maintain their charge over a wider pH range than weak ion exchangers and are suitable for most applications.

Consider using a weak exchanger (DEAE, CM) if the selectivity of the strong ion exchanger is unsatisfactory, but remember that the ion exchange capacity of a weak ion exchanger varies with pH.

Table 1. Overview of ion exchange groups on our resins

Ion exchanger type	Ion exchange group	Description
Strong	Anion exchanger	Q Quaternary ammonium
	Cation exchanger	SP Sulfopropyl
		S Methyl sulfonate
Weak	Anion exchanger	DEAE Diethylaminoethyl
	Cation exchanger	CM Carboxymethyl

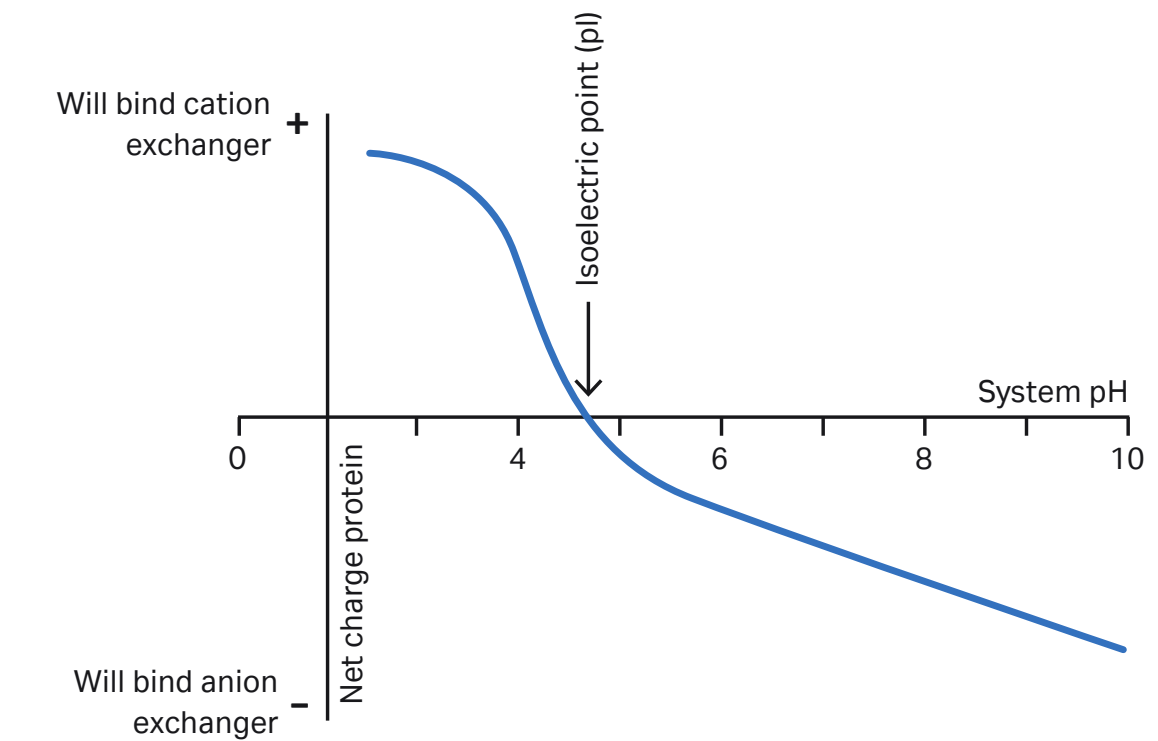


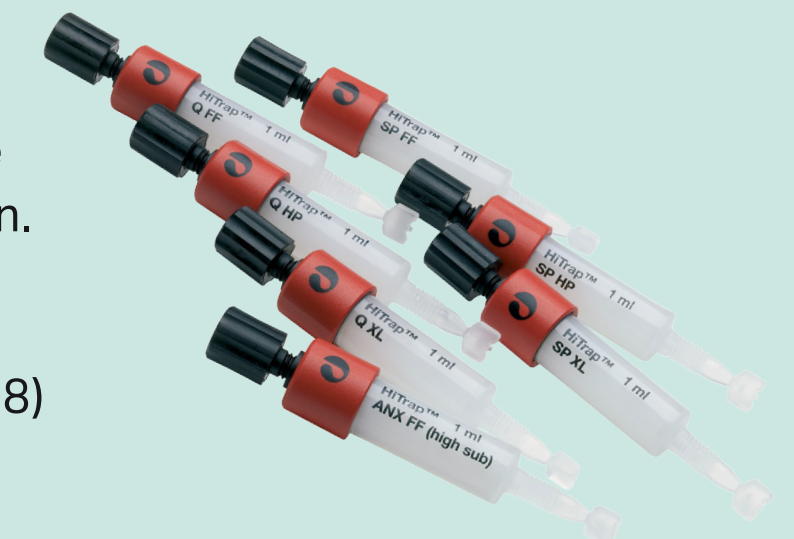
Fig 3. The net surface charge of a protein is highly pH dependent and will change gradually as the pH of the environment changes.

Good to know!

Our IEX selection kits help you screen for the optimal charged group for a given application.

- HiTrap IEX Selection Kit (17600233)
- HiTrap Capto IEX Selection Kit (28934388)

More on page 12.



Select the format according to your need



Applications

	Resin in bulk	HiTrap	RESOURCE	HiPrep	Tricorn (glass)	Tricorn (PEEK)*	HiScreen	PreDicator plates	PreDicator RoboColumn units
Small-scale preparative purification	●	●	●	●	●	●	●	●	●
Protein analysis					●	●			
Process development	●	●					●	●	●
High-throughput screening	●							●	●
Scale-down studies	●				●				

Use

	Resin in bulk	HiTrap	RESOURCE	HiPrep	Tricorn (glass)	Tricorn (PEEK)*	HiScreen	PreDicator plates	PreDicator RoboColumn units
Syringe		●							
Peristaltic pump	●	●							
Centrifuge	●							●	
Multichannel pipette								●	
Robotic liquid handling system	●							●	●
Chromatography systems	●	●	●	●	●	●	●		

If you need further guidance for product selection, check our digital selection tool [cytiva.com/purify](https://www.cytiva.com/purify)



* PEEK = Polyetherketone

Ordering information

Resin	Main feature	Particle size, d_{50V} *	Ligand	Ion exchanger	pH (operational)	Examples of dynamic binding capacities	Column format	Product name	Volume	Column dimensions $d \times h$ (mm)	Recommended flow rates	Max pressure over packed bed (MPa)	Pack size	Product code		
Capto HiRes	Our highest resolution IEX resin available in several prepacked formats†	8 μ m	Q	Strong anion	2 to 12	BSA 50 mg/mL resin	Tricorn glass column	Capto HiRes Q 5/50	1 mL	5 \times 50	0.5 to 2.0 mL/min	4	1 column	29275878		
				Strong cation				Capto HiRes Q 10/100	8 mL	10 \times 100	0.5 to 2.0 mL/min	4	1 column	29275881		
			S	Strong cation					Capto HiRes S 5/50	1 mL	5 \times 50	0.5 to 2.0 mL/min	4	1 column	29275877	
									Capto HiRes S 10/100	8 mL	10 \times 100	0.5 to 2.0 mL/min	4	1 column	29275879	
SOURCE 15	A high resolution resin that has high flow rates	15 μ m	Q	Strong anion	2 to 12	BSA 45 mg/mL resin	RESOURCE PEEK column	RESOURCE Q 1 mL	1 mL	6.4 \times 30	1 to 10 mL/min	1.5	1 column	17117701		
								RESOURCE Q 6 mL	6 mL	16 \times 30	1 to 60 mL/min	0.6	1 column	17117901		
							Tricorn PEEK column	SOURCE 15 Q 4.6/100 PE	1.7 mL	4.6 \times 100	0.5 to 2.5 mL/min	4	1 column	17518101		
								Resin in bulk	SOURCE 15 Q	50 mL	N/A	150 to 900 cm/h	0.5	1 bottle	17094701	
			S	Strong cation	2 to 13	Lysozyme 80 mg/mL resin	RESOURCE PEEK column	RESOURCE S 1 mL	1 mL	6.4 \times 30	1 to 10 mL/min	1.5	1 column	17117801		
								RESOURCE S 6 mL	6 mL	16 \times 30	1 to 60 mL/min	0.6	1 column	17118001		
							Tricorn PEEK column	SOURCE 15 S 4.6/100 PE	1.7 mL	4.6 \times 100	0.5 to 2.5 mL/min	4	1 column	17518201		
								Resin in bulk	SOURCE 15 S	50 mL	N/A	150 to 900 cm/h	0.5	1 bottle	17094401	
SOURCE 30	Use for intermediate purification and large-scale polishing	30 μ m	Q	Strong anion	2 to 12	HSA 50 mg/mL resin	Resin in bulk	SOURCE 30 Q	50 mL	N/A	300 to 1000 cm/h	0.3	1 bottle	17127501		
								200 mL						1 bottle	17127502	
			S	Strong cation	2 to 13	Lysozyme 80 mg/mL resin				SOURCE 30 S	50 mL	N/A	300 to 1000 cm/h	0.3	1 bottle	17127301
										200 mL						1 bottle
Sepharose High Performance (HP)	Use this resin for routine use in lab or for resin selection and pH scouting	34 μ m	Q	Strong anion	2 to 12	BSA 70 mg/mL resin	HiTrap column	HiTrap Q HP	1 mL	7 \times 25	up to 1 mL/min	0.3	1 column	29051325		
								1 mL	7 \times 25	up to 1 mL/min	0.3	5 columns	17115301			
								5 mL	16 \times 25	up to 5 mL/min	0.3	5 columns	17115401			
								HiScreen column	HiScreen Q HP	4.7 mL	7.7 \times 100	0.6 mL/min	0.3	1 column	28950511	
								HiPrep column	HiPrep Q HP 16/10	20 mL	16 \times 100	1 to 5 mL/min	0.3	1 column	29018182	
			SP	Strong cation	4 to 13	Ribonuclease 55 mg/mL resin	HiTrap column	Q Sepharose HP	75 mL	N/A	up to 150 cm/h	0.3	1 bottle	17101401		
								HiTrap SP HP	1 mL	7 \times 25	up to 1 mL/min	0.3	1 column	29051324		
								1 mL	7 \times 25	up to 1 mL/min	0.3	5 columns	17115101			
								5 mL	16 \times 25	up to 5 mL/min	0.3	5 columns	17115201			
								HiScreen column	HiScreen SP HP	4.7 mL	7.7 \times 100	0.6 mL/min	0.3	1 column	28950515	
HiPrep column	HiPrep SP HP 16/10	20 mL	16 \times 100	1 to 5 mL/min	0.3	1 column	29018183									
Resin in bulk	SP Sepharose HP	75 mL	N/A	up to 150 cm/h	0.3	1 bottle	17108701									

* Median particle size of the cumulative volume distribution

† Capto HiRes replaces MonoBeads resin

Ordering information

Resin	Main feature	Particle size, d_{50V} *	Ligand	Ion exchanger	pH (operational)	Examples of dynamic binding capacities	Column format	Product name	Volume	Column dimensions d × h (mm)	Recommended flow rates	Max pressure over packed bed (MPa)	Pack size	Product code							
Capto ImpRes	High resolution and throughput, flexibility of process design	40 μ m	Q	Strong anion	2 to 12	BSA > 55 mg/mL resin	HiTrap column	HiTrap Capto Q ImpRes	1 mL	7 × 25	up to 1 mL/min	0.5	5 columns	17547051							
									5 mL	16 × 25	up to 5 mL/min	0.3	5 columns	17547055							
							HiScreen column	HiScreen Capto Q ImpRes	4.7 mL	7.7 × 100	1.2 mL/min	0.4	1 column	17547015							
							PreDictor 96-well filter plates	PreDictor Capto Q ImpRes	6 μ L	N/A	N/A	N/A	4 × 96-well filter plates	17547016							
									20 μ L				4 × 96-well filter plates	17547017							
							PreDictor RoboColumn	PreDictor RoboColumn Capto Q ImpRes	200 μ L	N/A	N/A	N/A	row of 4 columns	28996918							
									600 μ L				row of 4 columns	28997391							
							Resin in bulk	Capto Q ImpRes	25 mL	N/A	300 cm/h	0.3	1 bottle	17547010							
									100 mL				1 bottle	17547002							
							Capto ImpRes	High resolution and throughput, flexibility of process design	40 μ m	SP	Strong cation	4 to 12	Lysozyme > 70 mg/mL resin	HiTrap column	HiTrap Capto SP ImpRes	1 mL	7 × 25	up to 1 mL/min	0.5	5 columns	17546851
																5 mL	16 × 25	up to 5 mL/min	0.3	5 columns	17546855
														HiScreen column	HiScreen Capto SP ImpRes	4.7 mL	7.7 × 100	1.2 mL/min	0.4	1 column	17546815
														Tricorn glass column	Capto SP ImpRes Validation column	15.7 mL	10 × 200	0.5 to 6.6 mL/min	Supplied in column certificate	1 column	29315186
PreDictor 96-well filter plates	PreDictor Capto SP ImpRes	6 μ L	N/A	N/A	N/A	4 × 96-well filter plates								17546816							
		20 μ L				4 × 96-well filter plates								17546817							
PreDictor RoboColumn	PreDictor Capto SP ImpRes Isotherm PreDictor RoboColumn Capto SP ImpRes	2, 4, 6, 8, 20 and 50 μ L				4 × 96-well filter plates								17546818							
		200 μ L	N/A	N/A	N/A	row of 4 columns								28997449							
PreDictor RoboColumn	PreDictor RoboColumn Capto SP ImpRes	600 μ L				row of 4 columns								28997450							
Resin in bulk	Capto SP ImpRes	25 mL	N/A	300 cm/h	0.3	1 bottle								17546810							
		100 mL				1 bottle								17546802							
Capto S ImpAct	Use Capto S ImpAct for efficient aggregate removal at high load of monoclonal antibodies	50 μ m	S	Strong cation	4 to 12	mAb > 100 mg/mL resin								HiTrap column	HiTrap Capto S ImpAct	1 mL	7 × 25	up to 1 mL/min	0.3	5 columns	17371751
									5 mL	16 × 25	up to 5 mL/min	0.3	5 columns	17371755							
							HiScreen column	HiScreen Capto S ImpAct	4.7 mL	7.7 × 100	1.2 mL/min	0.4	1 column	17371747							
							Tricorn glass column	Capto S Impact Validation column	15.7 mL	10 × 200	0.5 to 6.6 mL/min	Supplied in column certificate	1 column	29321910							
							PreDictor 96-well filter plates	PreDictor Capto S ImpAct	6 μ L	N/A	N/A	N/A	4 × 96-well filter plates	17546816							
									20 μ L				4 × 96-well filter plates	17546817							
							PreDictor RoboColumn	PreDictor RoboColumn	200 μ L	N/A	N/A	N/A	row of 4 columns	17371771							
									600 μ L				row of 4 columns	17371772							
							Resin in bulk	Capto S ImpAct	25 mL	N/A	220 cm/h	0.3	1 bottle	17371701							
100 mL				1 bottle	17371702																

* Median particle size of the cumulative volume distribution

† Capto HiRes replaces MonoBeads resin

Ordering information

Resin	Main feature	Particle size, d_{50}^*	Ligand	Ion exchanger	pH (operational)	Examples of dynamic binding capacities	Column format	Product name	Volume	Column dimensions $d \times h$ (mm)	Recommended flow rates	Max pressure over packed bed (MPa)	Pack size	Product code			
Capto	High volume throughput and high capacity. Easy scale-up	90 μm	Q	Strong anion	2 to 12	BSA > 100 mg/mL resin	HiTrap column	HiTrap Capto Q	1 mL	7 × 25	up to 1 mL/min	0.3	5 columns	11001302			
									5 mL	16 × 25	up to 5 mL/min	0.3	5 columns	11001303			
							HiScreen column	HiScreen Capto Q	4.7 mL	7.7 × 100	2.3 mL/min	0.3	1 column	28926978			
							Tricorn glass column	Capto Q Validation column	15.7 mL	10 × 200	0.5 to 6.6 mL/min	Supplied in column certificate	1 column	29363635			
							PreDictor 96-well filter plates	PreDictor Capto Q	2 μL	N/A	N/A	N/A	4 × 96-well filter plates	28925773			
									20 μL				4 × 96-well filter plates	28925806			
									50 μL				4 × 96-well filter plates	28925807			
								PreDictor Capto Q Isotherm	2, 4, 6, 8, 20 and 50 μL				4 × 96-well filter plates	28943278			
							PreDictor RoboColumn	PreDictor RoboColumn Capto Q	200 μL	N/A	N/A	N/A	row of 4 columns	28986072			
									600 μL				row of 4 columns	28986175			
			Resin in bulk	Capto Q	25 mL	N/A	up to 700 cm/h	0.3	1 bottle	17531610							
					100 mL				1 bottle	17531602							
			S	Strong cation	4 to 12		Strong cation	4 to 12	Lysozyme > 120 mg/mL resin	HiTrap column	HiTrap Capto S	1 mL	7 × 25	up to 1 mL/min	0.3	5 columns	17544122
												5 mL	16 × 25	up to 5 mL/min	0.3	5 columns	17544123
										HiScreen column	HiScreen Capto S	4.7 mL	7.7 × 100	2.3 mL/min	0.3	1 column	28926979
										PreDictor 96-well filter plates	PreDictor Capto S	2 μL	N/A	N/A	N/A	4 × 96-well filter plates	28925808
												20 μL				4 × 96-well filter plates	28925809
												50 μL				4 × 96-well filter plates	28925810
											PreDictor Capto S Isotherm	2, 4, 6, 8, 20 and 50 μL				4 × 96-well filter plates	28943279
										PreDictor RoboColumn	PreDictor RoboColumn Capto S	200 μL	N/A	N/A	N/A	row of 4 columns	28986081
600 μL													row of 4 columns	28986176			
Resin in bulk	Capto S	25 mL								N/A	up to 700 cm/h	0.3	1 bottle	17544110			
		100 mL				1 bottle	17544101										
DEAE	Weak anion	2 to 12		Weak anion	2 to 12	Ovalbumin > 90 mg/mL resin	HiTrap column	HiTrap Capto DEAE	1 mL	7 × 25	up to 1 mL/min	0.3	5 columns	28916537			
									5 mL	16 × 25	up to 5 mL/min	0.3	5 columns	28916540			
							HiScreen column	HiScreen Capto DEAE	4.7 mL	7.7 × 100	2.3 mL/min	0.3	1 column	28926982			
							PreDictor 96-well filter plates	PreDictor Capto DEAE	2 μL	N/A	N/A	N/A	4 × 96-well filter plates	28925811			
									20 μL				4 × 96-well filter plates	28925812			
									50 μL				4 × 96-well filter plates	28925813			
								PreDictor Capto DEAE Isotherm	2, 4, 6, 8, 20 and 50 μL				4 × 96-well filter plates	28943280			
							PreDictor RoboColumn	PreDictor RoboColumn Capto DEAE	200 μL	N/A	N/A	N/A	row of 4 columns	28986082			
									600 μL				row of 4 columns	28986177			
							Resin in bulk	Capto DEAE	25 mL	N/A	up to 700 cm/h	0.3	1 bottle	17544310			
		100 mL				1 bottle	17544301										

* Median particle size of the cumulative volume distribution

† Capto HiRes replaces MonoBeads resin

Ordering information

Resin	Main feature	Particle size, d_{50}^*	Ligand	Ion exchanger	pH (operational)	Examples of dynamic binding capacities	Column format	Product name	Volume	Column dimensions $d \times h$ (mm)	Recommended flow rates	Max pressure over packed bed (MPa)	Pack size	Product code			
Sephacose Fast Flow (FF)	Easy scale-up. Broad choice of selectivity.	90 μ m	Q	Strong anion	2 to 12	HSA 120 mg/mL resin	HiTrap column	HiTrap Q FF	1 mL	7 \times 25	up to 1 mL/min	0.3	5 columns	17505301			
									5 mL	16 \times 25	up to 5 mL/min	0.3	5 columns	17515601			
							HiScreen column	HiScreen Q FF	4.7 mL	7.7 \times 100	2.3 mL/min	0.15	1 column	28950510			
							HiPrep column	HiPrep Q FF 16/10	20 mL	16 \times 100	2 to 10 mL/min	0.15	1 column	28936543			
									Resin in bulk	Q Sepharose FF	25 mL	N/A	up to 700 cm/h	0.3	1 bottle	17051010	
											300 mL				1 bottle	17051001	
						SP	Strong cation	4 to 13	Ribonuclease 70 mg/mL resin	HiTrap column	HiTrap SP FF	1 mL	7 \times 25	up to 1 mL/min	0.3	5 columns	17505401
					5 mL					16 \times 25	up to 5 mL/min	0.3	5 columns	17515701			
			HiScreen column	HiScreen SP FF	4.7 mL					7.7 \times 100	2.3 mL/min	0.15	1 column	28950513			
			HiPrep column	HiPrep SP FF 16/10	20 mL					16 \times 100	2–10 mL/min	0.15	1 column	28936544			
									Resin in bulk	SP Sepharose FF	25 mL	N/A	up to 700 cm/h	0.3	1 bottle	17072910	
											300 mL	N/A	up to 700 cm/h	0.3	1 bottle	17072901	
						DEAE	Weak anion	2 to 12	HSA 110 mg/mL resin	HiTrap column	HiTrap DEAE FF	1 mL	7 \times 25	up to 1 mL/min	0.3	5 columns	17505501
					5 mL					16 \times 25	up to 5 mL/min	0.3	5 columns	17515401			
			HiScreen column	HiScreen DEAE FF	4.7 mL					7.7 \times 100	2.3 mL/min	0.15	1 column	28978245			
			HiPrep column	HiPrep DEAE FF 16/10	20 mL					16 \times 100	2 to 10 mL/min	0.15	1 column	28936541			
									Resin in bulk	DEAE Sepharose FF	25 mL	N/A	up to 700 cm/h	0.3	1 bottle	17070910	
											500 mL				1 bottle	17070901	
						ANX	Weak anion	3 to 13	BSA 43 mg/mL resin	HiTrap column	HiTrap ANX FF (high sub)	1 mL	7 \times 25	up to 1 mL/min	0.3	5 columns	17516201
					5 mL					16 \times 25	up to 5 mL/min	0.3	5 columns	17516301			
		Resin in bulk	ANX Sepharose 4 FF (high sub)	25 mL	N/A					up to 700 cm/h	0.3	1 bottle	17128710				
								500 mL				1 bottle	17128701				
			CM	Weak cation	4 to 13	Ribonuclease 50 mg/mL resin	HiTrap column	HiTrap CM FF	1 mL	7 \times 25	up to 1 mL/min	0.3	5 columns	17505601			
		5 mL					16 \times 25	up to 5 mL/min	0.3	5 columns	17515501						
		HiPrep column					HiPrep CM FF 16/10	20 mL	16 \times 100	2 to 10 mL/min	0.15	1 column	28936542				
		Resin in bulk					CM Sepharose FF	25 mL	N/A	up to 700 cm/h	0.3	1 bottle	17071910				
								500 mL				1 bottle	17071901				

* Median particle size of the cumulative volume distribution

† Capto HiRes replaces MonoBeads resin

Resin	Main feature	Particle size, d _{50v} *	Ligand	Ion exchanger	pH (operational)	Examples of dynamic binding capacities	Column format	Product name	Volume	Column dimensions d × h (mm)	Recommended flow rates	Max pressure over packed bed (MPa)	Pack size	Product code
Selection kits														
Sepharose FF	Use to screen the different IEX ligands for best fit with your protein	90	†	†	†	†	HiTrap Selection Kit	HiTrap IEX Selection Kit	1 mL	7 × 25	up to 1 mL/min	0.3	7 columns	17600233
Capto	Use to screen the different IEX and Multimodal ligands to find the fit with your protein	90	‡	‡	‡	‡	HiTrap Selection Kit	HiTrap Capto IEX Selection Kit	1 mL	7 × 25	up to 1 mL/min	0.3	5 columns	28934388
PreDictor Screening Plates														
AIEX resins screening	Use these plates to screen different anion resins		§	§	§	§	PreDictor screening kit	PreDictor AIEX Screening	2 µL/ 6 µL	N/A	N/A	N/A	4 × 96-well filter plates	28943288
									20 µL	N/A	N/A	N/A	4 × 96-well filter plates	28943289
CIEX resins screening	Use these plates to screen different cation resins		¶	¶	¶	¶	PreDictor screening kit	PreDictor CIEX Screening	2 µL/ 6 µL	N/A	N/A	N/A	4 × 96-well filter plates	28943290
									20 µL	N/A	N/A	N/A	4 × 96-well filter plates	28943291
Capto AIEX polishing resins screening	Use these plates to screen different anion exchangers specifically for polishing step		**	**	**	**	PreDictor screening kit	PreDictor Capto AIEX Polishing Screening	2 µL/ 6 µL	N/A	N/A	N/A	4 × 96-well filter plates	29095570
									20 µL	N/A	N/A	N/A	4 × 96-well filter plates	29095569
Capto CIEX polishing resins screening	Use these plates to screen different cation exchangers specifically for polishing step		††	††	††	††	PreDictor screening kit	PreDictor Capto CIEX Polishing Screening	2 µL/ 6 µL	N/A	N/A	N/A	4 × 96-well filter plates	29095568
									20 µL	N/A	N/A	N/A	4 × 96-well filter plates	29095567

* Median particle size of the cumulative volume distribution

† HiTrap IEX Selection Kit includes: HiTrap Q FF 1 mL, HiTrap SP FF 1 mL, HiTrap DEAE FF 1 mL, HiTrap CM FF 1 mL, HiTrap ANX FF (high sub) 1 mL, HiTrap Q XL 1 mL, and HiTrap SP XL 1 mL

‡ HiTrap Capto IEX Selection Kit includes: HiTrap Capto Q 1 mL, HiTrap Capto S 1 mL, HiTrap Capto DEAE 1 mL, HiTrap Capto MMC 1 mL, and HiTrap Capto adhere 1 mL

§ PreDictor AIEX screening plate 2 µL/6 µL contains: Capto Q 2 µL, Capto DEAE 2 µL, Q Sepharose Fast Flow 6 µL and Capto adhere 6 µL. The 20 µL screening plate contains: 20 µL per well of the corresponding resin.

¶ PreDictor CIEX screening plate 2 µL/6 µL contains: Capto S 2 µL, SP Sepharose Fast Flow 6 µL and Capto MMC 6 µL. The 20 µL screening plate contains: 20 µL per well of the corresponding resin.

** PreDictor Capto AIEX polishing screening plate 2 µL/6 µL contains: Capto Q 2 µL, Capto Q ImpRes 6 µL, Capto adhere 6 µL and Capto adhere ImpRes 6 µL. The 20 µL screening plate contains: 20 µL per well of the corresponding resin.

†† PreDictor Capto CIEX polishing screening plate 2 µL/6 µL contains: Capto S ImpAct 2 µL, Capto SP ImpRes 6 µL and Capto MMC ImpRes 6 µL. The 20 µL screening plate contains: 20 µL per well of the corresponding resin.

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