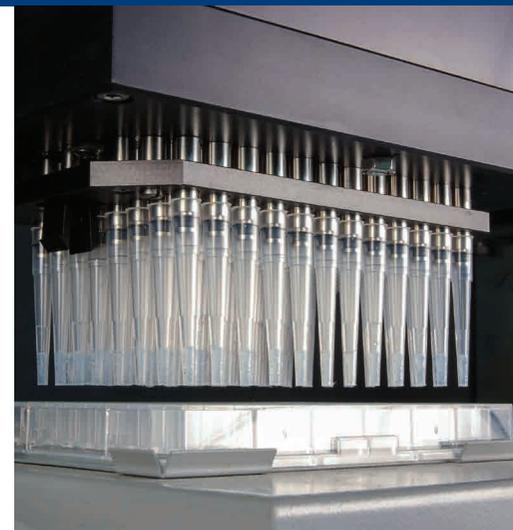


# Ion Exchange PhyTip® Columns

Perform resin screening for most efficient capture of target proteins

PhyTip® Ion Exchange columns offer the unique ability to screen different wash and elution buffers and a number of resins in a single experiment. Once Ion Exchange conditions have been optimized, they are directly transferable to larger manufacturing scale columns. The PhyTip column achieves chromatographic separation in a small, pipette tip column by driving the binding and release steps to equilibrium.

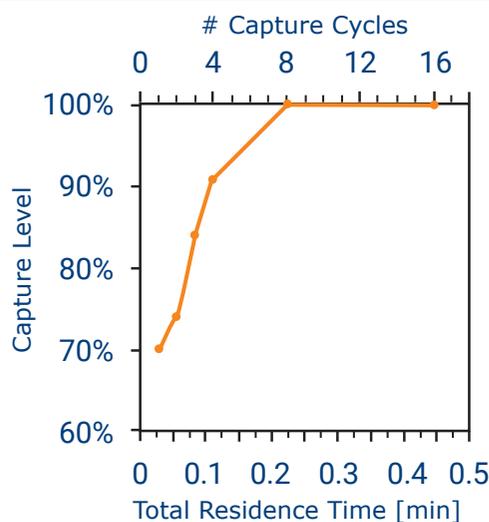
- » High Performance
- » Minimum Dilution
- » High Throughput
- » Small Volume Samples
- » Scalable
- » Reproducible



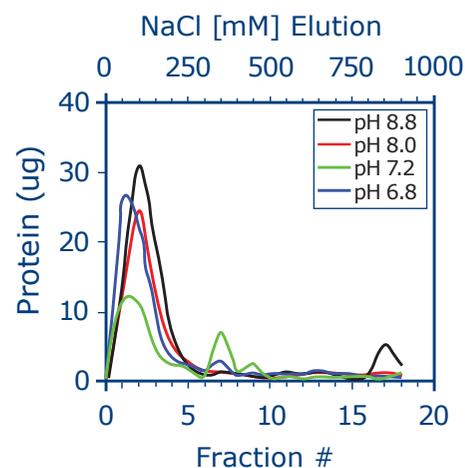
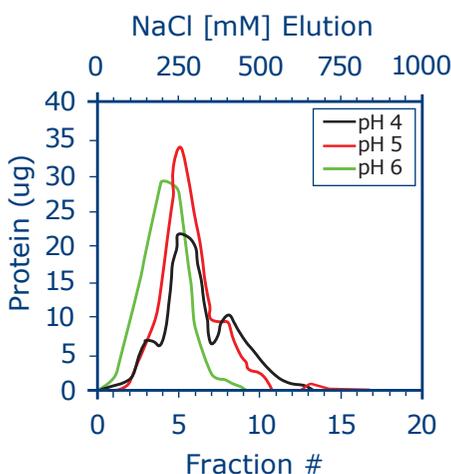
## Ion Exchange columns with dual flow chromatography technology

- » Develop ion exchange purification methods in a fast and efficient manner
- » Automation compatible on all major liquid handling robotic systems
- » Take advantage of parallel processing to screen resins
- » Applications include optimization of protein purification conditions, imidazole removal after His-tagged protein purification and high-throughput replacement of finishing columns

## Ion Exchange Binding Capacity

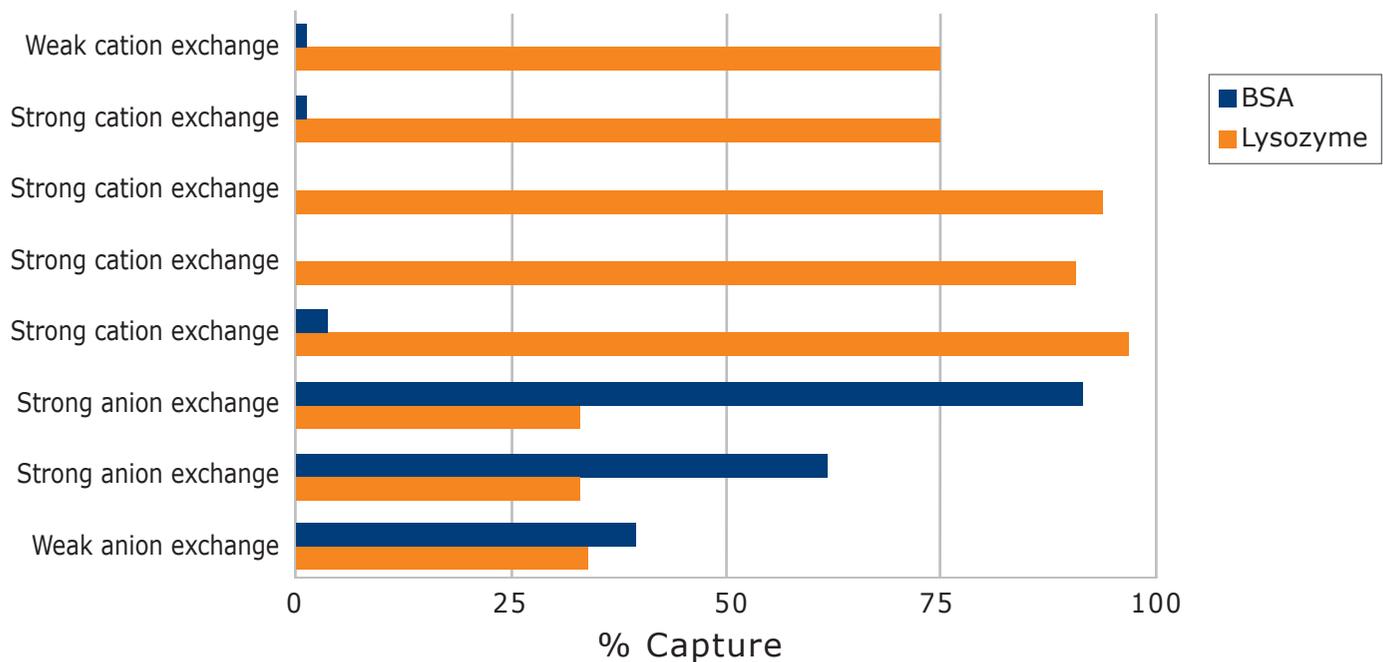


**Figure 1**  
Further process optimization of lysozyme binding conditions with cation exchange columns: binding efficiency as a function of residence time and capture cycles at pH 6.0.



**Figure 2**  
Recovery of BSA using a weak anion exchange resin (left) and lysozyme using a weak cation exchange resin (right). A matrix of binding buffers of varying pH and elution buffers of increasing salt concentration allow for rapid process optimization using PhyTip® columns.

# Capture Efficiency of Ion Exchange



**Figure 3**  
**Ion exchange resins screening for most efficient binding**

5mL of each of eight different ion exchange resins were packed into PhyTip columns and tested for efficiency of capture in parallel. Using the MEA Personal Purification System, the columns were equilibrated in 100mL of 25mM Tris pH 8.0, 5mM NaCl using 1 cycle at 0.25mL/minute, and performed 8 capture cycles at 0.25mL/minute of 200mL capture buffer spiked with BSA to 2mg/mL. Starting sample and sample flow through was quantified by the Nanodrop UV spectrometer for absorbance at 280nm. The lysozyme capture efficiency was performed in the same way except columns were equilibrated in 25mM Na-citrate, pH 6.0, 5mM NaCl buffer and samples were composed of the same equilibration buffer spiked with lysozyme to 0.4mg/mL. Comparison of capture of two proteins using 8 different resins took less than 35 minutes.

## Ion Exchange PhyTip® Columns

Tip Volumes	Resin Volumes
200 (µL)	5 (µL)
300 (µL)	10 (µL)
500 (µL)	20 (µL)
1000 (µL)	40 (µL)
	80 (µL)
	160 (µL)
	320 (µL)

To learn more, visit  
[www.phynexus.com/ionexchange](http://www.phynexus.com/ionexchange)

## Robotics Compatibility

PhyTip® columns can be used with all major 8, 12, and 96-channel automation liquid handling robots including Agilent Technologies, Beckman Coulter, Dynamic Devices, Hamilton, Opentrons, Perkin Elmer, and Tecan

