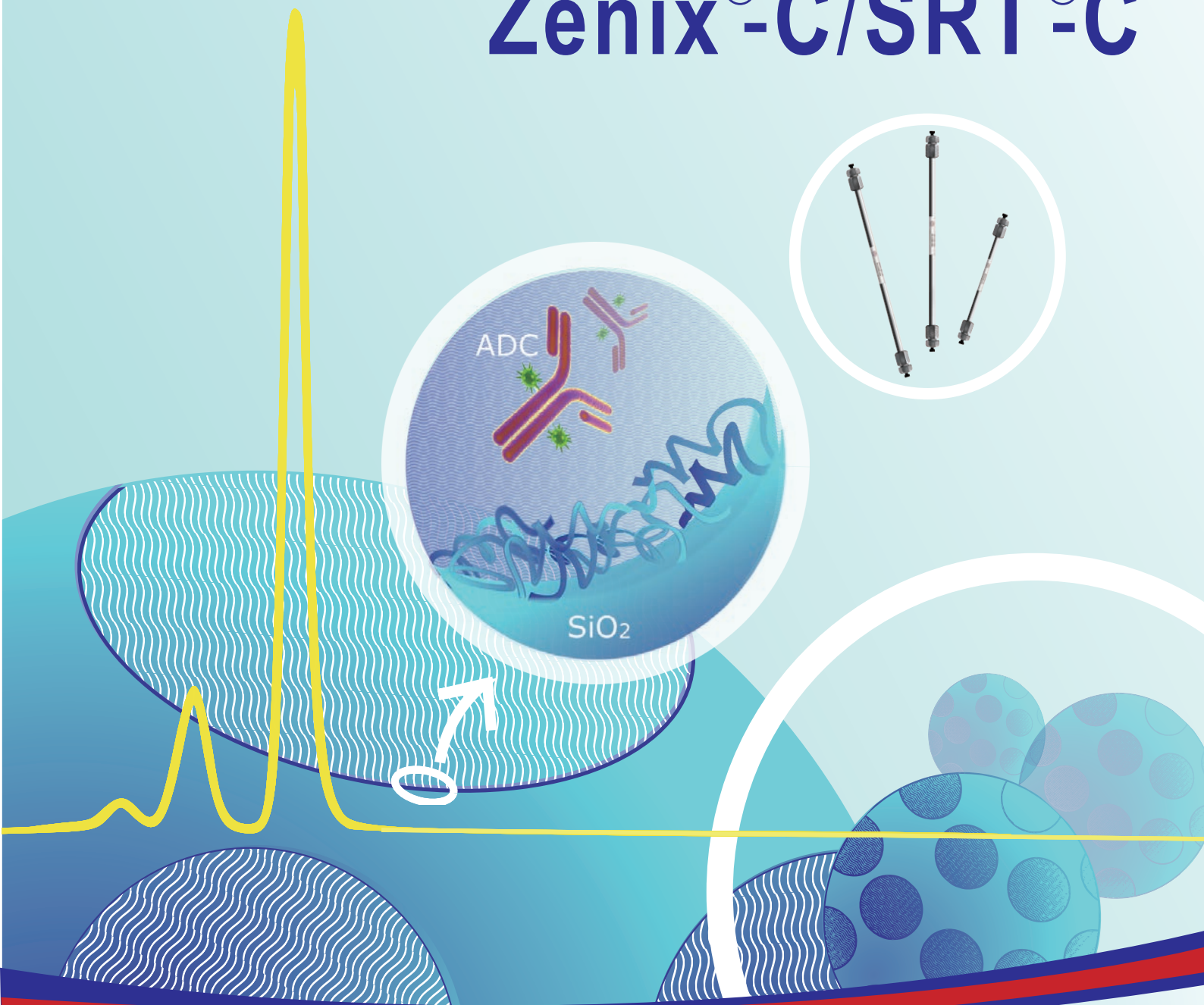


# Size Exclusion Chromatography



*Sepax Technologies*

## Zenix<sup>®</sup>-C/SRT<sup>®</sup>-C



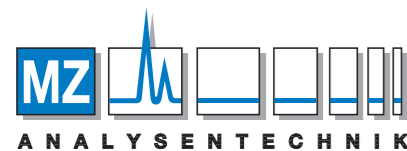
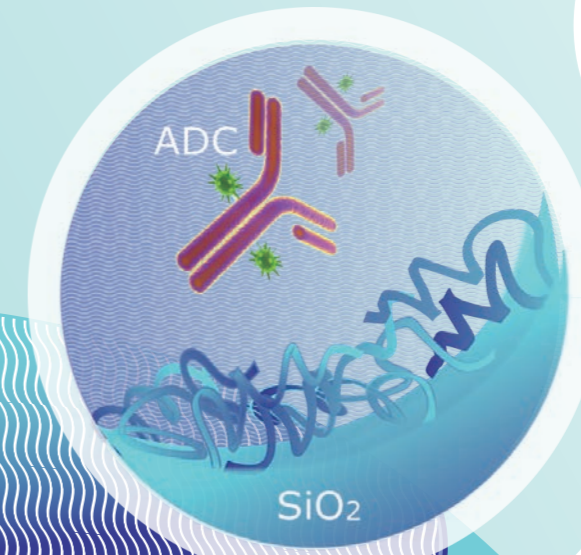
Better Surface Chemistry for Better Separation

# Size Exclusion Chromatography



Sepax Technologies

## Zenix<sup>®</sup>-C/SRT<sup>®</sup>-C



**AUTHORIZED DISTRIBUTOR**

MZ-Analysentechnik GmbH, Barcelona-Allee 17 • D-55129 Mainz  
Tel +49 6131 880 96-0, Fax +49 6131 880 96-20  
e-mail: info@mz-at.de, www.mz-at.de

Sepax Technologies, Inc.

5 Innovation Way,  
Newark, Delaware, USA  
Tel: (302)366-1101  
Fax: (302)366-1151  
Toll Free: 1-877-SEPAX-US  
www.sepax-tech.com  
Printed August 2018



Better Surface Chemistry for Better Separation

# Sepax Technologies, Inc.

Sepax Technologies, Inc. develops and manufactures products in the area of chemical and biological separations, biosurfaces and proteomics. Sepax product portfolio includes 1) liquid chromatography columns and media, 2) SPE and Flash chromatography columns and tubes, 3) bulk resin for preparative separation and process chromatography, and 4) natural product and Chinese traditional medicine separation and purification.



## *Leader in Biological Separations*

Sepax develops and manufactures wide range of biological separation products using both silica and polymeric resins as the support. The selection of particle size is from 1  $\mu\text{m}$  to 100  $\mu\text{m}$  and pore size from non-porous to 2000  $\text{\AA}$ . Unique and proprietary resin synthesis and surface technologies have been developed for solving the separation challenges in biological area.



## *Bioseparation Products*

### Size Exclusion

SRT<sup>®</sup>

SRT<sup>®</sup>-C

Nanofilm<sup>®</sup>

Zenix<sup>®</sup>

Zenix<sup>®</sup>-C

### Ion Exchange

Proteomix<sup>®</sup> IEX

Antibodix<sup>®</sup> WCX

### Hydrophobic Interaction

Proteomix<sup>®</sup> HIC

### Carbohydrate Separation

Carbomix<sup>®</sup>

## Analytical, Semi-prep and Preparative

SRT, Zenix, Antibodix, Proteomix and Carbomix are registered trademarks of Sepax Technologies, Inc.

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# Zenix<sup>®</sup>-C/SRT<sup>®</sup>-C SEC Phases

## Complimentary Phases to Zenix and SRT for Hydrophobic Biomolecules

### General Description

#### Zenix<sup>®</sup>-C and SRT<sup>®</sup>-C SEC phases

Developed based on innovative surface coating technology comprised of uniform, hydrophilic, and neutral nanometer thick films chemically bonded on high purity and mechanically stabilized silica. Two different types of coating chemistries, Zenix and SRT, stand-up monolayer bonded on porous silica, and Zenix-C and SRT-C, lay-down monolayer on porous silica offer ideal phase structures for sample type specific separation. The 3 μm based Zenix and Zenix-C, and 5 μm based SRT and SRT-C allow high resolution and performance separation. The combination of these four lines of SEC phases provides a powerful total solution for robust, reproducible and highest resolution size based separation of biological molecules in the market.

### Featured Characteristics

- Highest capacity and resolution
- High lot-to-lot reproducibility
- High protein recovery with intact biological activity
- Negligible non-specific interactions
- Ideal for separation and analysis of hydrophobic proteins and monoclonal antibodies derivatized with polymer branches
- Suitable for separation and analysis of general biological samples

### Stationary Phase Structure

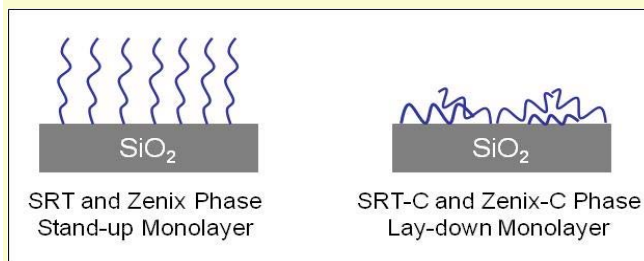


Figure 1. Phase structure difference: a monolayer stands up on the silica surface for Zenix and SRT, and a monolayer lays down on the silica surface for Zenix-C and SRT-C.

### Difference in Particle Size

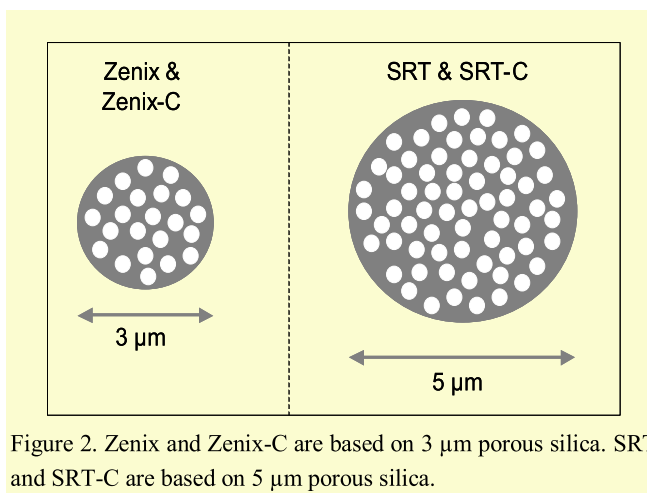


Figure 2. Zenix and Zenix-C are based on 3 μm porous silica. SRT and SRT-C are based on 5 μm porous silica.

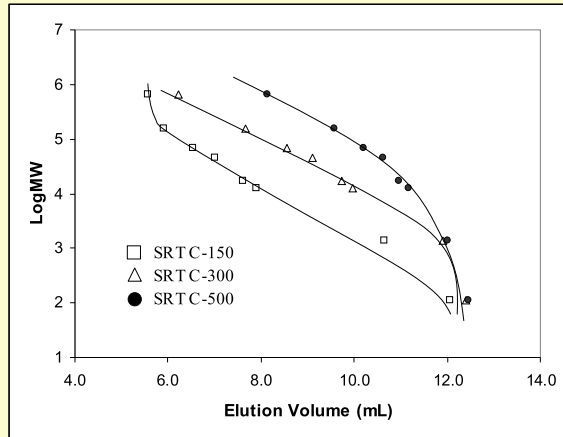
### Key features of Sepax SEC phases

Characteristics	SRT	Zenix	SRT-C	Zenix-C
Particle size	5 μm	3 μm	5 μm	3 μm
Pore size (Å)	100, 150, 300, 500, 1000 & 2000	80, 100, 150, 300	100, 150, 300, 500, 1000 & 2000	80, 100, 150, 300
Resolution	High	Higher, short column for faster separation	High	Higher, short column for faster separation
Surface structure	Chemically bonded stand-up monolayer		Chemically bonded lay-down monolayer	
Recommended Sample Types	Monoclonal antibodies, proteins, peptides, nucleic acids, oligonucleotides, virus, and water-soluble polymers		"Tough samples" such as hydrophobic samples like insulin, membrane protein, antibody drug conjugates, proteins conjugated with hydrophobic molecules.	

## Protein Molecular Weight Calibration

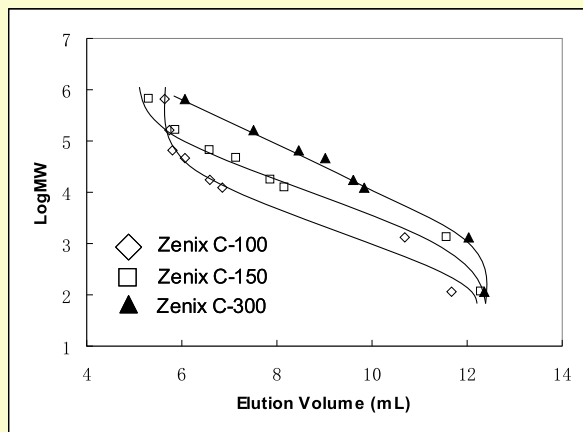
Protein molecular weight vs elution volume is plotted in Figure 3-4, indicating that SRT-C 150, 300, and 500, and Zenix-C 80, 100, 150, and 300 have large linear elution region.

Figure 3. Protein MW Calibration with Elution Volume for SRT-C Phases



Columns: SRT-C (5  $\mu$ m, 7.8 x 300 mm)  
 Mobile phase: 150 mM sodium phosphate buffer, pH 7.0  
 Flow rate: 1.0 mL/min  
 Temperature: Ambient  
 Detection: UV 214 nm  
 Injection volume: 10  $\mu$ L  
 Samples: 1. Thyroglobulin, 670 kD; 2.  $\gamma$ -Globulin, 158 kD; 3. BSA, 66 kD; 4. Ovalbumin, 44 kD; 5. Myoglobin, 17.6 kD; 6. Ribonuclease A, 13.7 kD; 7. Vitamin B12, 1.35 kD; 8. Uracil, 120 D

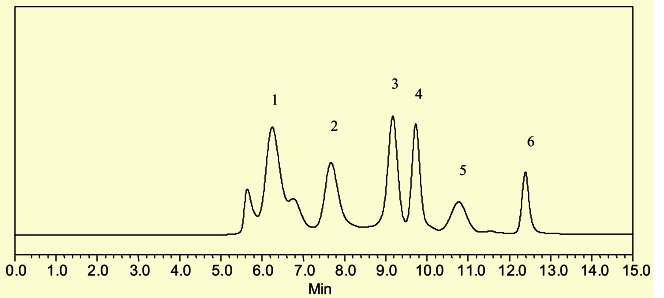
Figure 4. Protein MW Calibration with Elution Volume for Zenix-C Phases



Columns: Zenix-C (3  $\mu$ m, 7.8 x 300 mm)  
 Mobile phase: 150 mM sodium phosphate buffer, pH 7.0  
 Flow rate: 1.0 mL/min  
 Temperature: Ambient  
 Detection: UV 214 nm  
 Injection volume: 10  $\mu$ L  
 Samples: 1. Thyroglobulin, 670 kD; 2.  $\gamma$ -Globulin, 158 kD; 3. BSA, 66 kD; 4. Ovalbumin, 44 kD; 5. Myoglobin, 17.6 kD;

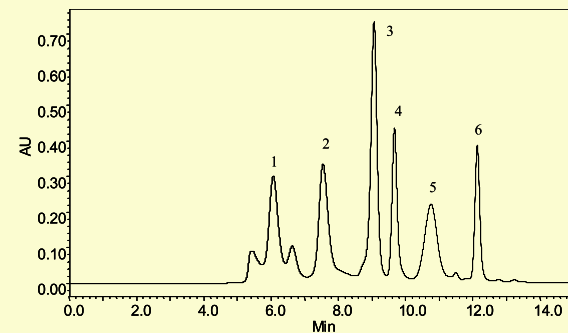
## Column Performance with Protein Standards

Figure 5. Separation of Protein Standards by SRT-C SEC-300 Column



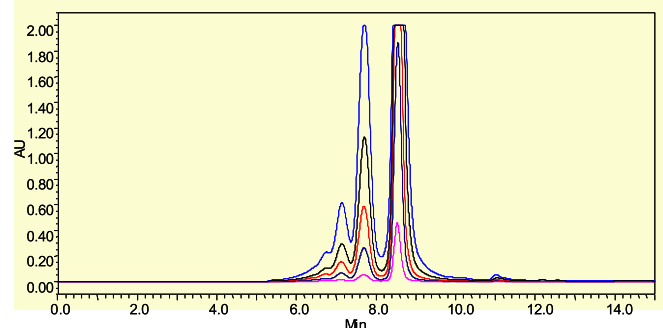
Column: SRT-C SEC-300 (5  $\mu$ m, 300  $\text{\AA}$  7.8 x 300 mm)  
 Mobile phase: 150 mM sodium phosphate buffer, pH 7.0  
 Flow rate: 1.0 mL/min  
 Temperature: Ambient  
 Detection: UV 214 nm  
 Injection: 10  $\mu$ L  
 Sample: 1. Thyroglobulin, 670kD; 2.  $\gamma$ -Globulin, 158 kD; 3. Ovalbumin, 44kD; 4. Myoglobin, 17.6 kD; 5. Poly-DL-alanine (1-5 kD); 6. Uracil, 120 D.

Figure 6. Separation of a Protein Standards by Zenix-C SEC-300 column



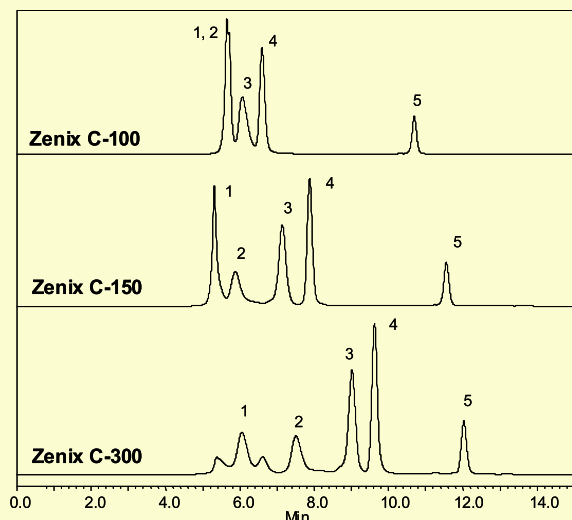
Column: Zenix-C SEC-300 (3  $\mu$ m, 300  $\text{\AA}$ , 7.8 x 300 mm)  
 Mobile phase: 150 mM sodium phosphate buffer, pH 7.0  
 Flow rate: 1.0 mL/min  
 Temperature: Ambient  
 Detection: UV 214 nm  
 Injection: 10  $\mu$ L  
 Sample: 1) Thyroglobulin, 670 kD; 2)  $\gamma$ -Globulin, 158 kD; 3) Ovalbumin, 44 kD; 4) Myoglobin, 17.6 kD; 5) Poly-DL-alanine (1-5 kD); 6) Vitamin B12, 1.35 kD.

Figure 7. BSA Loading Test on a Zenix-C SEC-300 Column



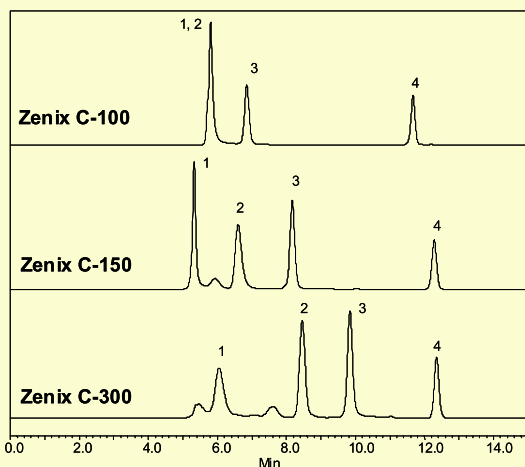
Column: Zenix-C SEC-300 (3  $\mu$ m, 300  $\text{\AA}$ , 7.8 x 300 mm)  
 Mobile phase: 150 mM sodium phosphate buffer, pH 7.0  
 Flow rate: 1.0 mL/min  
 Temperature: Ambient  
 Detection: UV 214 nm  
 Injection: 10  $\mu$ L  
 BSA concentration: 1, 5, 10, 25, and 50 mg/mL (from low to high)

Figure 8. Separation of Biorad Protein Standards by Zenix-C SEC-100, 150 and 300 Columns



Columns: Zenix-C SEC (3  $\mu$ m, 7.8 x 300 mm)  
 Mobile phase: 150 mM sodium phosphate buffer, pH 7.0  
 Flow rate: 1.0 mL/min  
 Temperature: Ambient  
 Detection: UV 214 nm  
 Injection: 10  $\mu$ L  
 Sample: 1. Thyroglobulin, 670 kD; 2.  $\gamma$ -Globulin, 158 kD; 3. Ovalbumin, 44 kD; 4. Myoglobin, 16.9 kD; 5. Vitamin B12, 1.35 kD.

Figure 9. Separation of Protein Standards A by Zenix-C SEC-100, 150 and 300 Columns



Column: Zenix-C SEC (3  $\mu$ m, 7.8 x 300 mm)  
 Mobile phase: 150 mM sodium phosphate buffer, pH 7.0  
 Flow rate: 1.0 mL/min  
 Temperature: Ambient

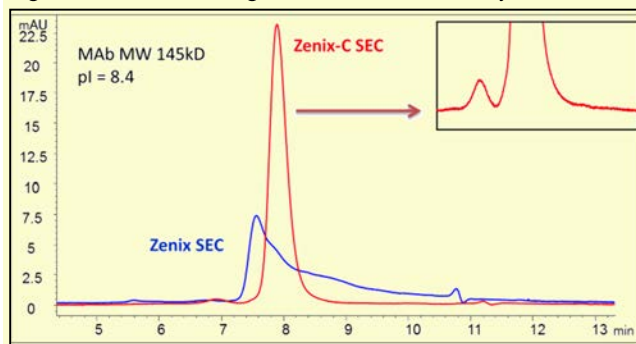
Detection: UV 214 nm  
 Injection: 10  $\mu$ L  
 Sample: 1. Thyroglobulin, 670 kD; 2. BSA, 66 kD; 3. Ribonuclease A, 13.7 kD, and 4. Uracil, 120 D.

## Applications

Zenix-C and SRT-C SEC phases provide better recovery and separation for hydrophobic biomolecules, which have secondary interaction with traditional resin surfaces due to the hydrophobic property. Different mobile phase additives such as organics, like IPA, arginine sodium perchlorate and acetonitrile, can improve the sample recovery and separation resolution depending on individual hydrophobic biomolecule. Applications on the separation of hydrophobic molecules like Antibody Drug Conjugate (ADC), Fusion Protein, PEGylated Protein, Membrane Protein and Peptide on Zenix-C and SRT-C SEC columns were illustrated in the following Figure 10-31.

### Hydrophobic Monoclonal Antibody (MAb)

Figure 10. SEC Screening for Monoclonal Antibody F.

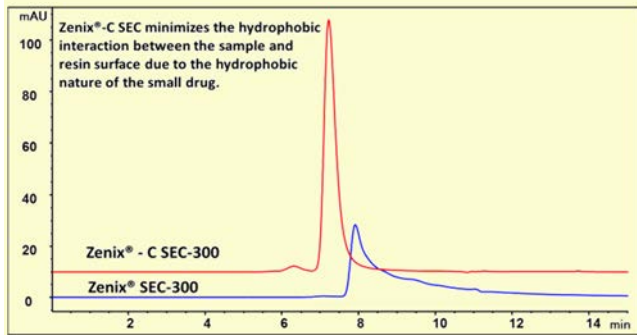


Column: Zenix-C SEC-300 (3  $\mu$ m, 300  $\text{\AA}$ , 7.8 x 300 mm)  
 Mobile phase: 150 mM sodium phosphate, pH 7.0  
 Flow rate: 1.0 mL/min  
 Detection: UV 280 nm  
 Temperature: Ambient  
 Injection: 10  $\mu$ L  
 Sample: 1.23 mg/mL MAb F in 10 mM sodium succinate, pH 5.0

### Antibody Drug Conjugate (ADC)

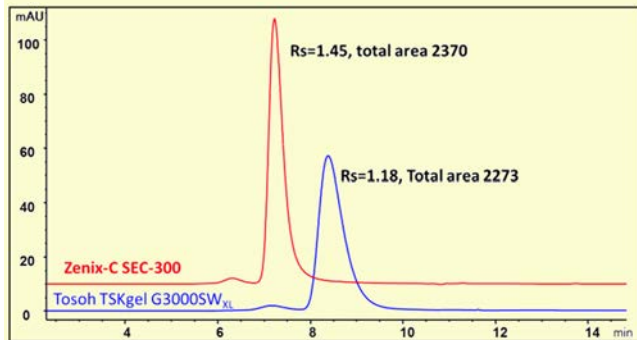
Zenix-C SEC phase offers better recovery and separation for Antibody Drug Conjugate (ADC), which has secondary interaction with traditional resin surfaces due to its hydrophobic property from the conjugated small drugs. Different mobile phase additives such as organics, like IPA, arginine sodium perchlorate and acetonitrile, can improve the sample recovery and separation resolution depending on individual ADCs. Smaller pore size Zenix-C SEC is proven to be beneficial in free drug analysis, which can be in line with mass spectrometry with volatile mobile phases.

Figure 11. Herceptin Lysine ADC Analysis



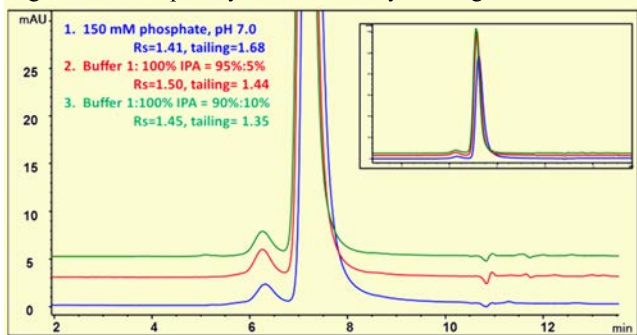
Column: Zenix-C SEC-300 (3  $\mu$ m, 300  $\text{\AA}$ , 7.8 x 300 mm)  
 Mobile phase: 150 mM sodium phosphate buffer, pH 7.0  
 Flow rate: 1 mL/min  
 Detection: UV 280 nm  
 Temperature: Ambient  
 Injection: 10  $\mu$ L  
 Samples: Herceptin lysine conjugate 2.05 mg/mL

Figure 12. Herceptin Lysine ADC Analysis on Zenix-C SEC-300 vs. Tosoh TSKgel G3000SWXL



Column: Zenix - C SEC-300 (3  $\mu$ m, 300  $\text{\AA}$ , 7.8 x 300 mm)  
 Tosoh TSKgel G3000SWXL(5  $\mu$ m, 250  $\text{\AA}$ , 7.8 x 300 mm)  
 Mobile phase: 150 mM sodium phosphate buffer, pH 7.0  
 Flow rate: 1 mL/min  
 Detection: UV 280 nm  
 Temperature: Ambient  
 Injection: 10  $\mu$ L  
 Samples: Herceptin lysine drug conjugate 2.05 mg/mL  
 Disclaimer: TSKgel and Tosoh Bioscience are registered trademarks of Tosoh Corporation; Comparative separations may not be representative of all applications.

Figure 13. Herceptin Lysine ADC Analysis - Organic Modifier



Column: Zenix-C SEC-300 (3  $\mu$ m, 300  $\text{\AA}$ , 7.8 x 300 mm)  
 Mobile phase: As indicated  
 Flow rate: 1 mL/min

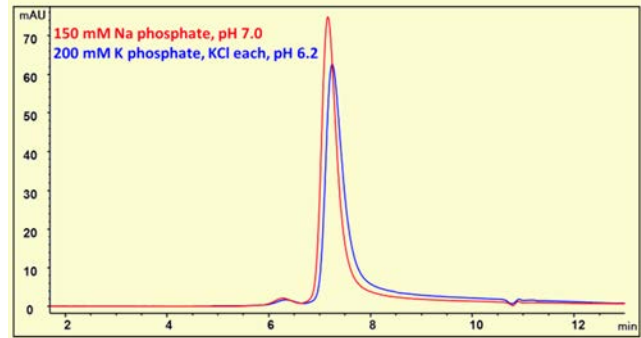
Detection: UV 280 nm

Temperature: Ambient

Injection: 10  $\mu$ L

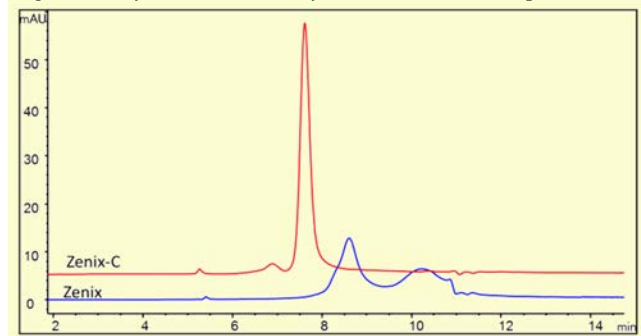
Samples: Herceptin lysine conjugate 2.05 mg/mL

Figure 14. Herceptin lysine ADC Analysis - Salt Difference



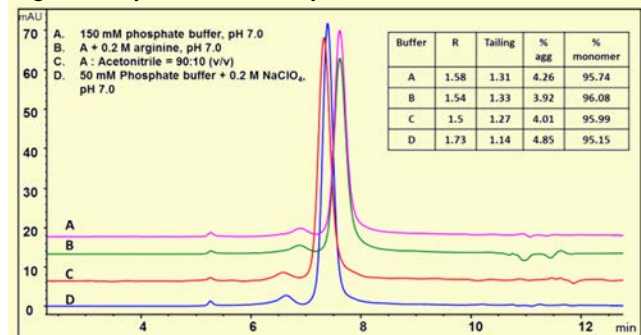
Column: Zenix-C SEC-300 (3  $\mu$ m, 300  $\text{\AA}$ , 7.8 x 300 mm)  
 Mobile phase: As indicated  
 Flow rate: 1 mL/min  
 Detection: UV 214 nm  
 Temperature: Ambient  
 Injection: 10  $\mu$ L  
 Samples: Herceptin lysine ADC 2.05 mg/mL

Figure 15. Cysteine ADC Analysis - SEC Phase Comparison



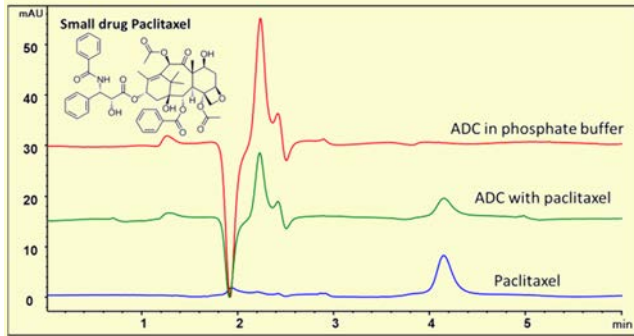
Column: Zenix-C SEC-300 (3  $\mu$ m, 300  $\text{\AA}$ , 7.8 x 300 mm)  
 Mobile phase: 150 mM sodium phosphate buffer, pH 7.0  
 Flow rate: 1 mL/min  
 Detection: UV 280 nm  
 Temperature: Ambient  
 Injection: 20  $\mu$ L  
 Samples: 1.68 mg/mL ADC

Figure 16. Cysteine ADC Analysis - Mobile Phase Difference



Column: Zenix-C SEC-300 (3  $\mu$ m, 300  $\text{\AA}$ , 7.8 x 300 mm)  
 Mobile phase: As indicated  
 Flow rate: 1 mL/min  
 Detection: UV 280 nm  
 Temperature: Ambient  
 Injection: 20  $\mu$ L  
 Samples: 1.68 mg/mL ADC

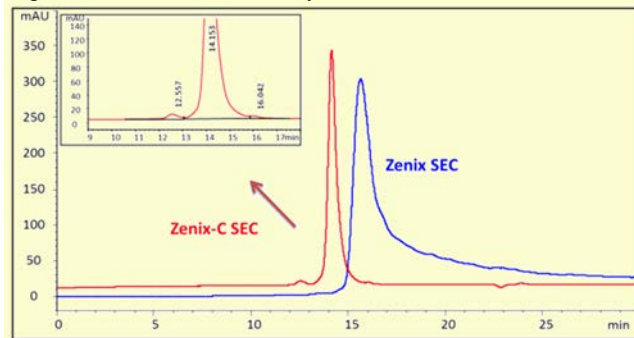
Figure 17. ADC and Free Drug Paclitaxel Analysis



Column: Zenix-C SEC-80 (3  $\mu$ m, 80  $\text{\AA}$ , 4.6 x 50 mm)  
 Mobile phase: 50 mM NH<sub>4</sub>Ac : ACN = 80 : 20 (v/v)  
 Flow rate: 0.3 mL/min  
 Detection: UV 228 nm  
 Temperature: 25  $^{\circ}$ C  
 Injection: 2  $\mu$ L  
 Samples: As indicated

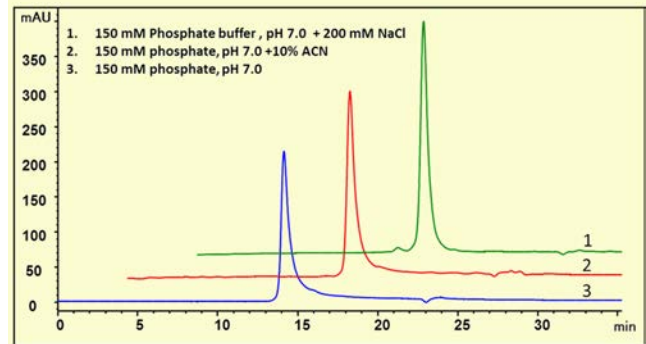
**Fusion Protein and Peptide**

Figure 18. Fusion Protein Analysis



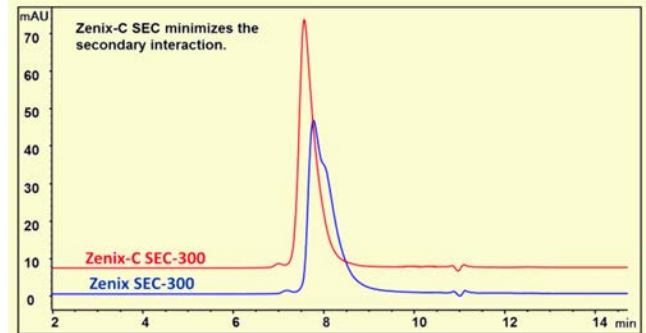
Column: Zenix-C SEC-300 (3  $\mu$ m, 300  $\text{\AA}$ , 7.8 x 300 mm)  
 Mobile phase: 150 mM sodium phosphate buffer (pH 7.0) + 200 mM NaCl  
 Flow rate: 0.5 mL/min  
 Detection: UV 214 nm  
 Temperature: Ambient  
 Injection: 10  $\mu$ L  
 Samples: 1 mg/mL IBI302, MW 170 kD, pI 6.8-7.0

Figure 19. Fusion Protein 3 - Mobile Phase Effect



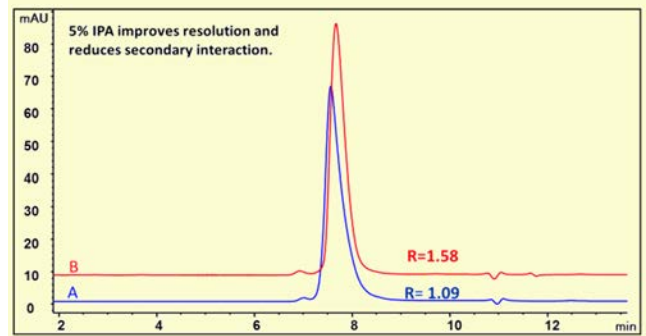
Column: Zenix-C SEC-300 (3  $\mu$ m, 300  $\text{\AA}$ , 7.8 x 300 mm)  
 Mobile phase: As indicated  
 Flow rate: 0.5 mL/min  
 Detection: UV 214 nm  
 Temperature: Ambient  
 Volume: 10  $\mu$ L  
 Samples: 1 mg/mL fusion protein, MW 170 kD, pI 6.8-7.0  
 10% retention time offset for presentation purpose

Figure 20. HSA Conjugated Peptide - SEC Phase Comparison



Column: Zenix-C SEC-300 (3  $\mu$ m, 300  $\text{\AA}$ , 7.8 x 300 mm)  
 Mobile phase: 150 mM sodium phosphate buffer, pH 7.0  
 Flow rate: 1.0 mL/min  
 Detection: UV 280 nm  
 Temperature: Ambient  
 Injection: 10  $\mu$ L  
 Samples: HSA fusion peptide 5 mg/mL (MW 75 kD, pI 5.0, HSA conjugated peptide in diabetes treatment)

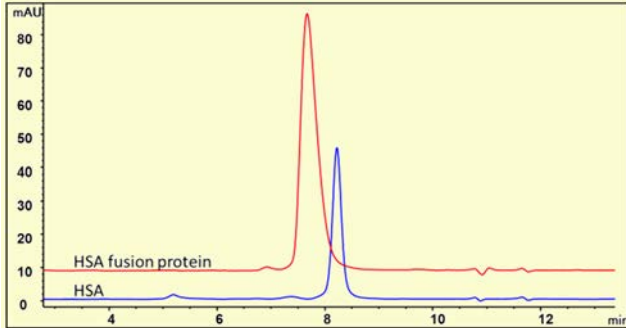
Figure 21. HSA Conjugated Peptide - Mobile Phase Effect





Column: Zenix-C SEC-300 (3  $\mu$ m, 300  $\text{\AA}$ , 7.8 x 300 mm)  
 Mobile phase: A. 150 mM sodium phosphate buffer, pH 7.0, B: 150 mM Phosphate buffer (pH 7.0) : IPA = 95 : 5 (v/v)  
 Flow rate: 1.0 mL/min  
 Detection: UV 280 nm  
 Temperature: Ambient  
 Injection: 10  $\mu$ L  
 Samples: HSA fusion peptide 5 mg/mL (MW 75 kD, pI 5.0, HSA conjugated peptide in diabetes treatment)

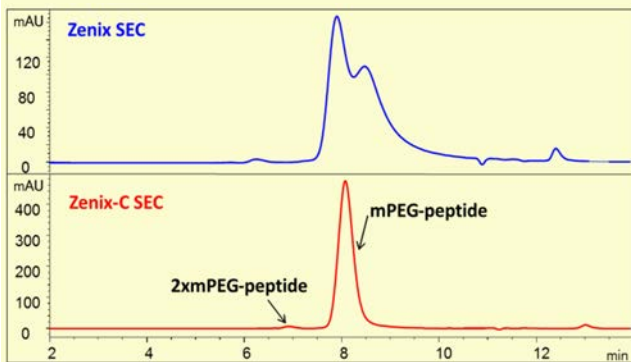
Figure 22. HSA Conjugated Peptide vs HSA



Column: Zenix-C SEC-300 (3  $\mu$ m, 300  $\text{\AA}$ , 7.8 x 300 mm)  
 Mobile phase: 150 mM sodium phosphate buffer (pH 7.0) : IPA = 95 : 5 (v/v)  
 Flow rate: 1.0 mL/min  
 Detection: UV 280 nm  
 Temperature: Ambient  
 Injection: 10  $\mu$ L  
 Samples: HSA fusion peptide 5 mg/mL (MW 75 kD, pI 5.0, HSA conjugated peptide in diabetes treatment), HSA 2 mg/mL

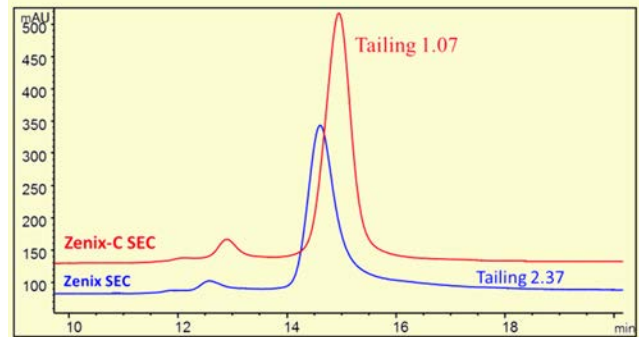
### PEGylated Protein and Peptide

Figure 23. mPEG-peptide (20 kD PEG + 4 kD peptide)



Column: Zenix-C SEC-300 (3  $\mu$ m, 300  $\text{\AA}$ , 7.8 x 300 mm)  
 Mobile phase: 150 mM sodium phosphate buffer, pH 7.0  
 Flow rate: 1.0 mL/min  
 Temperature: Ambient  
 Detection: UV 214 nm  
 Injection: 10  $\mu$ L  
 Sample: mPEG-peptide concentration is 6 mg/ml

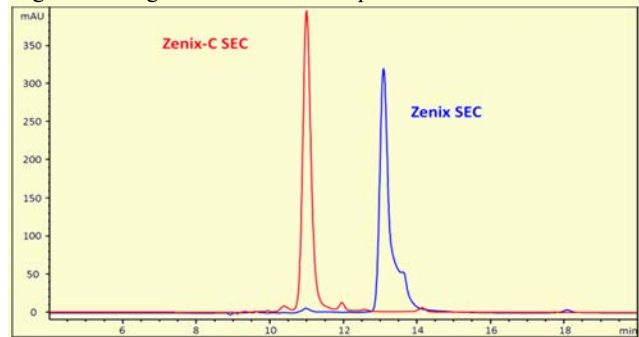
Figure 24. PEGylated Exenatide Separation



Column: Zenix-C SEC-300 (3  $\mu$ m, 300  $\text{\AA}$ , 7.8 x 300 mm)  
 Mobile phase: 50 mM  $\text{CH}_3\text{COONH}_4$  : ACN = 90 : 10 (v/v)  
 Flow rate: 0.5 mL/min  
 Temperature: Ambient  
 Detection: UV 214 nm  
 Injection: 15  $\mu$ L  
 Pressure: 42 bar  
 Sample: 3.3 mg/mL PEG-Exenatide in water (PEG 23 kD)

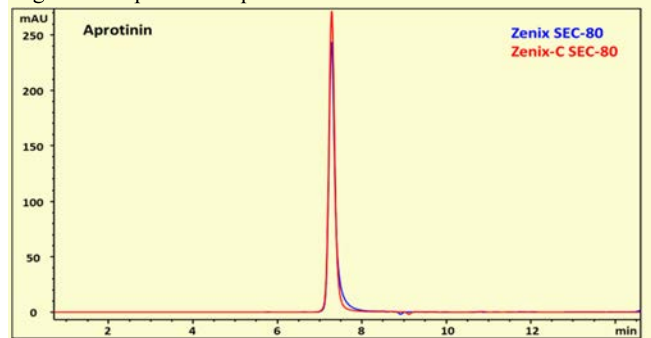
### Peptide Separation

Figure 25. Angiotensin I Acetate Separation



Column: Zenix-C SEC-80 (3  $\mu$ m, 80  $\text{\AA}$ , 7.8 x 300 mm)  
 Flow rate: 1 mL/min  
 Temperature: Ambient  
 Detection: UV 214  
 Mobile phase: 150 mM sodium phosphate buffer pH 7.0  
 Injection: 5  $\mu$ L

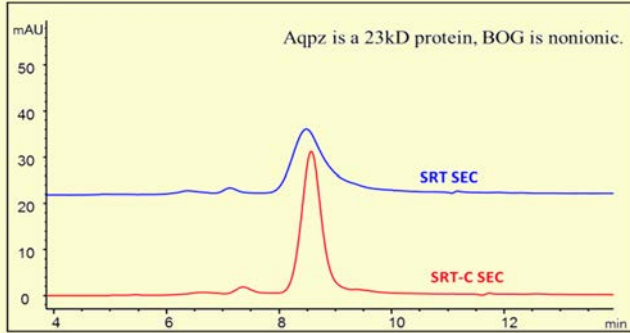
Figure 26. Aprotinin Separation



Column: Zenix-C SEC-80 (3  $\mu\text{m}$ , 80  $\text{\AA}$ , 7.8 x 300 mm)  
 Flow rate: 1 mL/min  
 Temperature: Ambient  
 Detection: UV 214  
 Mobile phase: 150 mM sodium phosphate buffer pH 7.0  
 Injection: 5  $\mu\text{L}$

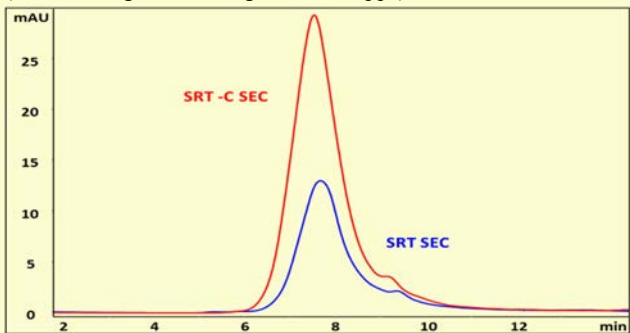
## Membrane Protein

Figure 27. Membrane Protein Aqz Separation  
 (Acknowledgement: Brad Bennett at University of Virginia)



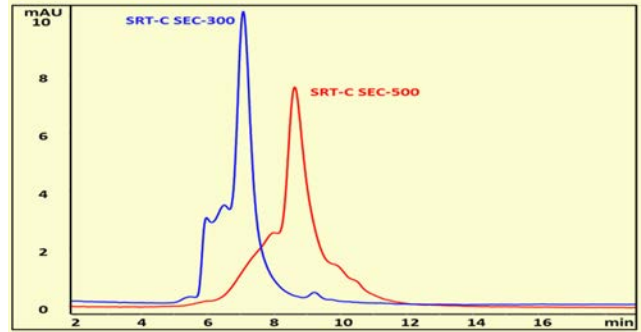
Column: SRT-C SEC-300 (5  $\mu\text{m}$ , 300  $\text{\AA}$ , 7.8 x 300 mm)  
 Mobile phase: 20 mM TrisHCl, pH 7.0, 190 mM NaCl, 10 mM KCl, 40 mM Octyl glucoside  
 Flow rate: 1 mL/min  
 Temperature: Ambient  
 Detection: UV280 nm  
 Injection: 2 mL of 6 mg/mL

Figure 28. Bacterial K Channel (16 kD homotetramer) in 0.261% DDM (n-dodecyl-b-D-Maltoside)  
 (Acknowledgement: Sung Lee at Scripps)



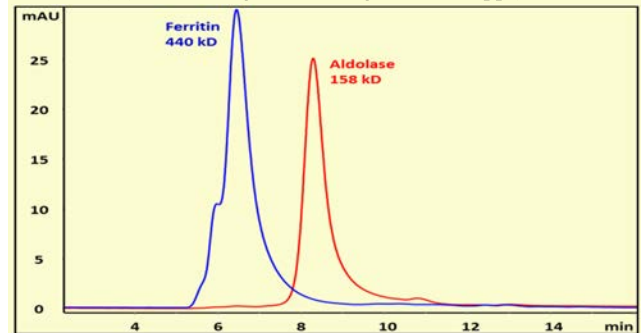
Column: SRT-C SEC-300 (5  $\mu\text{m}$ , 300  $\text{\AA}$ , 4.6 x 300 mm)  
 Mobile phase: 20 mM Tris pH 7.5, 20 mM NaCl, 0.261% DDM  
 Flow rate: 0.35 mL/min  
 Temperature: Ambient  
 Detection: UV280 nm

Figure 29. Bacterial ABC Transporter (65 kD homodimer) in 0.1% UDM( $\beta$ -undecylmaltoside)



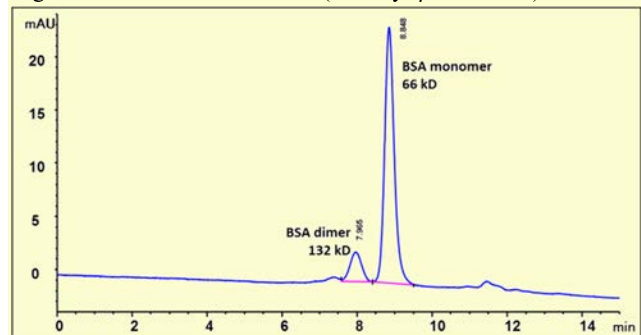
Column: SRT-C SEC-300 (5  $\mu\text{m}$ , 300  $\text{\AA}$ , 4.6 x 300 mm)  
 SRT-C SEC-500 (5  $\mu\text{m}$ , 300  $\text{\AA}$ , 4.6 x 300 mm)  
 Mobile phase: 20 mM Tris pH 7.5, 20 mM NaCl, 0.1% UDM  
 Flow rate: 0.35 mL/min  
 Temperature: Ambient  
 Detection: UV280 nm, AKTA FPLC system

Figure 30. Ferritin and Aldolase in 0.261% DDM (n-dodecyl-b-D-Maltoside) (Acknowledgement: Sung Lee at Scripps)



Column: SRT-C SEC-300 (5  $\mu\text{m}$ , 300  $\text{\AA}$ , 4.6 x 300 mm)  
 Mobile phase: 20 mM Tris pH 7.5, 20 mM NaCl, 0.261% DDM  
 Flow Rate: 0.35 mL/min  
 Temperature: Ambient  
 Detection: UV280 nm; AKTA FPLC system

Figure 31. BSA in 0.02% TDM (Tridecyl- $\beta$ -maltoside)



Column: SRT-C SEC-300 (5  $\mu\text{m}$ , 300  $\text{\AA}$ , 7.8 x 300 mm)  
 Mobile phase: 50mM HEPES, pH7.5, 500mM NaCl, 0.02% TDM, 2% Glycerol  
 Flow rate: 1 mL/min  
 Temperature: Ambient  
 Detection: UV 280 nm  
 Temperature: 25  $^{\circ}\text{C}$   
 Samples: 20  $\mu\text{L}$  BSA 1mg/mL in mobile phase

## SRT-C Technical Specifications

Phase	SRT-C SEC-100	SRT-C SEC-150	SRT-C SEC-300
Material	Neutral, hydrophilic film bonded silica	Neutral, hydrophilic film bonded silica	Neutral, hydrophilic film bonded silica
Particle size	5 µm	5 µm	5 µm
Pore size (Å)	~ 100	~ 150	~ 300
Protein MW range (native)	100 - 100,000	500 - 150,000	5,000 - 1,250,000
pH stability <sup>①</sup>	2 - 8.5	2 - 8.5	2 - 8.5
Backpressure (psi for a 7.8x300 mm) <sup>②</sup>	~ 700 psi	~ 700 psi	~ 700 psi
Salt concentration range	20 mM - 2.0 M	20 mM - 2.0 M	20 mM - 2.0 M
Mobile phase compatibility	Aqueous and organic	Aqueous and organic	Aqueous and organic

Phase	SRT-C SEC-500	SRT-C SEC-1000	SRT-C SEC-2000
Material	Neutral, hydrophilic film bonded silica	Neutral, hydrophilic film bonded silica	Neutral, hydrophilic film bonded silica
Particle size	5 µm	5 µm	5 µm
Pore size (Å)	~ 500	~ 1000	~ 2000
Protein MW range (native)	15,000 - 5,000,000	50,000 - 7,500,000	> 10,000,000
pH stability <sup>①</sup>	2 - 8.5	2 - 8.5	2 - 8.5
Backpressure (psi for a 7.8x300 mm) <sup>②</sup>	~ 700 psi	~ 700 psi	~ 700 psi
Salt concentration range	20 mM - 2.0 M	20 mM - 2.0 M	20 mM - 2.0 M
Mobile phase compatibility	Aqueous and organic	Aqueous and organic	Aqueous and organic

## Zenix-C Technical Specifications

Phase	Zenix-C SEC-80	Zenix-C SEC-100	Zenix-C SEC-150	Zenix-C SEC-300
Material	Neutral, hydrophilic film bonded silica	Neutral, hydrophilic film bonded silica	Neutral, hydrophilic film bonded silica	Neutral, hydrophilic film bonded silica
Particle size	3 µm	3 µm	3 µm	3 µm
Pore size (Å)	~ 80	~ 100	~ 150	~ 300
Protein MW range (native)	100-50,000	100 - 100,000	500 - 150,000	5,000 - 1,250,000
pH stability <sup>①</sup>	2 - 8.5	2 - 8.5	2 - 8.5	2 - 8.5
Backpressure for 7.8x300 mm (1.0 mL/min) <sup>②</sup>	~1885 psi	~ 1,500 psi	~ 1,375 psi	~ 1,100 psi
Backpressure for 4.6x300 mm (0.35 mL/min)	~1450 psi	~ 1,400 psi	~ 1,250 psi	~ 1,000 psi
Salt concentration range	20 mM - 2.0 M	20 mM - 2.0 M	20 mM - 2.0 M	20 mM - 2.0 M
Mobile phase compatibility	Aqueous and organic	Aqueous and organic	Aqueous and organic	Aqueous and organic

① Store the column in neutral pH, or 20% ethanol in water

② Recommended maximum flow rate for 7.8 x 300 mm 1.5 ml/min



## Ordering Information

Other dimension and pore size available upon request

### SRT-C SEC Column

#### SRT-C SEC-100 (5 $\mu\text{m}$ , 100 $\text{\AA}$ )

ID x Length (mm)	P/N
7.8 x 300	235100-7830
7.8 x 50 (Guard)	235100-7805
4.6 x 300	235100-4630
4.6 x 50 (Guard)	235100-4605
10 x 300	235100-10030
21.2 x 300	235100-21230

#### SRT-C SEC-150 (5 $\mu\text{m}$ , 150 $\text{\AA}$ )

ID x Length (mm)	P/N
7.8 x 300	235150-7830
7.8 x 50 (Guard)	235150-7805
4.6 x 300	235150-4630
4.6 x 50 (Guard)	235150-4605
10 x 300	235150-10030
21.2 x 300	235150-21230

#### SRT-C SEC-300 (5 $\mu\text{m}$ , 300 $\text{\AA}$ )

ID x Length (mm)	P/N
7.8 x 300	235300-7830
7.8 x 50 (Guard)	235300-7805
4.6 x 300	235300-4630
4.6 x 50 (Guard)	235300-4605
10 x 300	235300-10030
21.2 x 300	235300-21230
10 x 300	233300-10030
21.2 x 300	233300-21230

#### SRT-C SEC-500 (5 $\mu\text{m}$ , 500 $\text{\AA}$ )

ID x Length (mm)	P/N
7.8 x 300	235500-7830
7.8 x 50 (Guard)	235500-7805
4.6 x 300	235500-4630
4.6 x 50 (Guard)	235500-4605
10 x 300	235500-10030
21.2 x 300	235500-21230

#### SRT-C SEC-1000 (5 $\mu\text{m}$ , 1000 $\text{\AA}$ )

ID x Length (mm)	P/N
7.8 x 300	235950-7830
7.8 x 50 (Guard)	235950-7805
4.6 x 300	235950-4630
4.6 x 50 (Guard)	235950-4605
10 x 300	235950-10030
21.2 x 300	235950-21230

#### SRT-C SEC-2000 (5 $\mu\text{m}$ , 2000 $\text{\AA}$ )

ID x Length (mm)	P/N
7.8 x 300	235980-7830
7.8 x 50 (Guard)	235980-7805
4.6 x 300	235980-4630
4.6 x 50 (Guard)	235980-4605
10 x 300	235980-10030
21.2 x 300	235980-21230

### Zenix-C SEC Column

#### Zenix-C SEC-80 (3 $\mu\text{m}$ , 80 $\text{\AA}$ )

ID x Length (mm)	P/N
7.8 x 300	233080-7830
7.8 x 50 (Guard)	233080-7805
4.6 x 300	233080-4630
4.6 x 50 (Guard)	233080-4605
10 x 300	233080-10030
21.2 x 300	233080-21230

#### Zenix-C SEC-100 (3 $\mu\text{m}$ , 100 $\text{\AA}$ )

ID x Length (mm)	P/N
7.8 x 300	233100-7830
7.8 x 50 (Guard)	233100-7805
4.6 x 300	233100-4630
4.6 x 50 (Guard)	233100-4605

#### Zenix-C SEC-150 (3 $\mu\text{m}$ , 150 $\text{\AA}$ )

ID x Length (mm)	P/N
7.8 x 300	233150-7830
7.8 x 50 (Guard)	233150-7805
4.6 x 300	233150-4630
4.6 x 50 (Guard)	233150-4605
10 x 300	233150-10030
21.2 x 300	233150-21230

#### Zenix-C SEC-300 (3 $\mu\text{m}$ , 300 $\text{\AA}$ )

ID x Length (mm)	P/N
7.8 x 300	233300-7830
7.8 x 50 (Guard)	233300-7805
4.6 x 300	233300-4630
4.6 x 50 (Guard)	233300-4605
10 x 300	233300-10030
21.2 x 300	233300-21230

## How to Order

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5 Innovation Way, Suite 100  
 Delaware Technology Park  
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