

# ExmERE Ltd.

Silica Engineering

Exsil Pure™  
UPLC

High Through Put Phases

Over 30 Years of Experience

# Exsil Pure™

High Speed  
High Performance

Discover new Possibilities

## Silica Bulk for HPLC

The best for the best

- Ultra High Efficient
- Perfect Reproducibility
- Exceptional Performance

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# Choose Exsil Pure for Protein and Peptide Analysis

## Exsil Pure 500 C18

### Ultra Fast Protein and Peptide Separations

- 10 times faster bio separations than traditional column formats
- Ultra-high efficiency 1.5µm packing
- Fast protein and peptide separations with conventional HPLC systems

#### Exsil Pure 500A C18 Specifications

Phase	Base Material	Particle Shape	Particle Size	Pore Size	Surface Area	Carbon Load	Phase Type	Endcapped?	USP L-code
C18	Silica	Spherical	1.5, 3µm	500Å	60m <sup>2</sup> /g	3%	Monomeric	Yes	L1

### Optimization of Gradient Parameters for Fast Protein Analysis

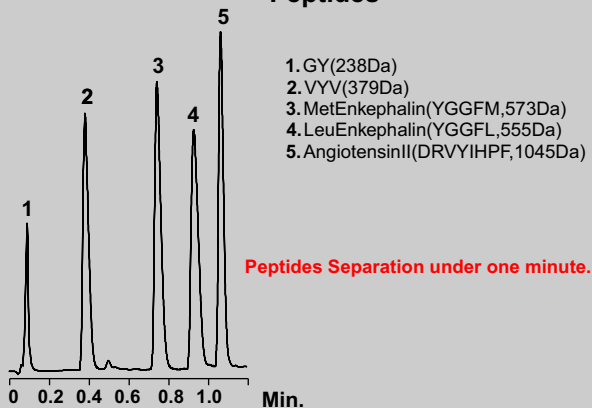
Short Exsil Pure 500A columns are the perfect tool for fast reversed-phase protein separations. Under gradient conditions, longer columns only increase run time and do not increase resolution to improve the separation.

### Postulated Separation Mechanism of Peptides and Proteins

Proteins adsorb at the head of the column and then desorb once the critical mobile phase concentration is reached. Since the proteins do not interact with the full length of the packed bed, short columns are sufficient for full resolution. Therefore, proteins of broad molecular weight ranges can be separated in less than one minute by combining short columns higher flow rates, and fast, modified gradients. For best results high-pressure mixing should be used with fast gradients.

## Proteins & Peptides/Reversed-Phase

### Peptides

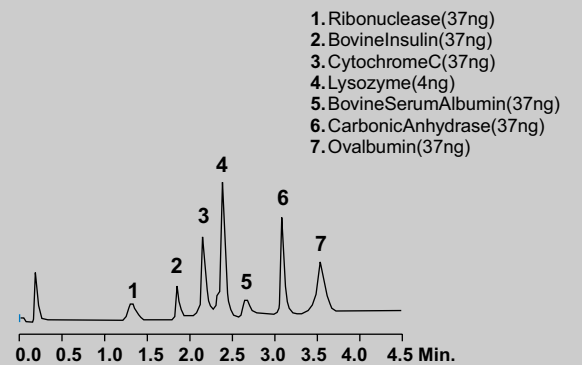


**Column:** Exsil Pure 500 C18, 1.5µm, 10x2.0mm  
**Mobile Phase:** A: 0.1% Trifluoroacetic Acid in Water  
 B: 0.085% Trifluoroacetic Acid in Acetonitrile (20:80)  
**Gradient:**

Time:	0	0.1	0.7	1.1	1.2
%B:	4	15	20	50	4

  
**Flow Rate:** 0.8ml/min  
**Detector:** UV at 215nm

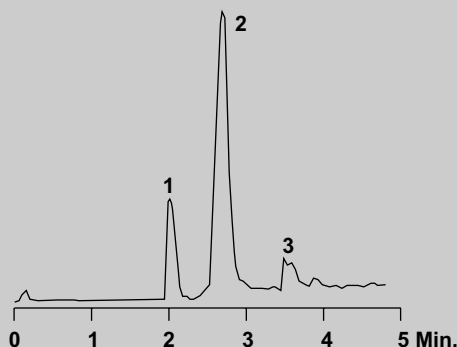
### Fast Protein Analysis



**Column:** Exsil Pure 500 C18, 1.5µm, 10x2.0mm  
**Mobile Phase:** A: 0.1% Trifluoroacetic Acid in Water  
 B: 0.085% Trifluoroacetic Acid in Acetonitrile  
**Gradient:**

Time:	0	4.0	4.5	4.7
%B:	23	75	75	23

  
**Flow Rate:** 0.2ml/min  
**Detector:** UV at 280nm



1. Human Insulin, M=5803(ave.)  
 2. Human Serum Albumin, M=66520(ave.)  
 3. Human Growth Hormone, M=22123(ave.)

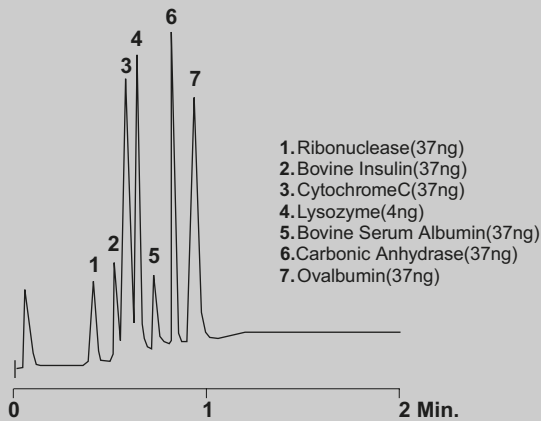
**Column:** Exsil Pure 500 C18 ,2.0x10mm  
**Mobile Phase:** A: 0.2% Formic Acid, 0.01% Trifluoroacetic Acid in Acetonitrile:Water(5:95)  
 B: 0.2% Formic Acid, 0.01% Trifluoroacetic Acid in Acetonitrile:Water(80:20)  
**Gradient:**

Time:	0	4.0	4.5	4.7
%B:	20	90	90	20

  
**Flow Rate:** 0.4ml/min  
**Detector:** AB/MDS Sciex Q TRAP® MS. EMS scan 400-1700 amu;  
 scan rate=1000amu/s; ion spray voltage=5000V; LIT fill time=50ms;  
 Q 3 entry barrier=8V; declustering potential=20; collision energy=10eV;  
 curtain gas=50; ion source gas1=45; ion source gas 2 = 70  
 temperature(TEM) =350°C.

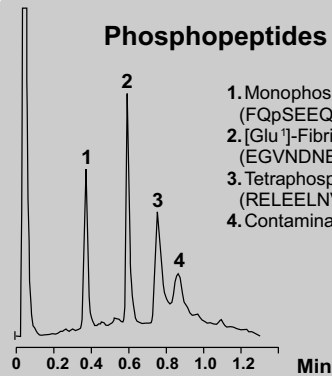
**Injection Amount:** 8µg each, except 1.5µg for growth hormone

# Columns for Low Volume High Throughput LC



1. Ribonuclease(37ng)
2. Bovine Insulin(37ng)
3. CytochromeC(37ng)
4. Lysozyme(4ng)
5. Bovine Serum Albumin(37ng)
6. Carbonic Anhydrase(37ng)
7. Ovalbumin(37ng)

**Column:** Exsil Pure 500 C18, 1.5µm, 2.0x10mm  
**Mobile Phase:** A: 0.1%TFA in Water  
 B: 0.085%TFA in Acetonitrile  
**Flow Rate:** 0.8ml/min  
**Detector:** UV at 280nm  
**Injection Vol.:** 5µL



1. Monophosphopeptide (FQpSEEQQTEDELQDK)
2. [Glu-1]-FibrinopeptideB (EGVNDNEEGFFSAR)
3. Tetraphosphopeptide (RELEELNVPGEIVEpSLpSpSpSEESITR)
4. Contaminant(s)

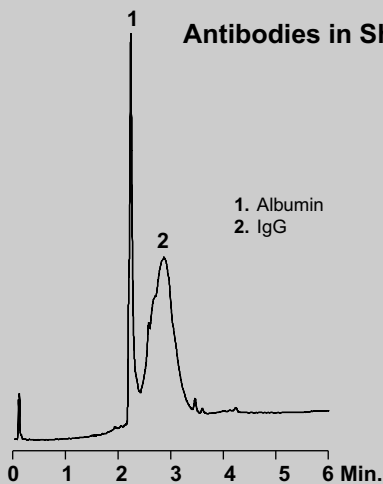
**Column:** Exsil Pure 500 C18, 1.5µm, 2.0x10mm  
**HPLC System:** HPG binary pump  
**Mobile Phase:** A: 0.1% Trifluoroacetic Acid in Water  
 B: 0.085% Trifluoroacetic Acid in Acetonitrile:Water (80:20)  
**Gradient:**

Time:	0.0	1.0	1.1	1.3	1.4
%B:	12	60	80	80	12

  
**Flow Rate:** 0.8ml/min  
**Detector:** UV at 215nm

## Peptide and Protein Separation within 1 Minute

### Antibodies in Sheep Serum



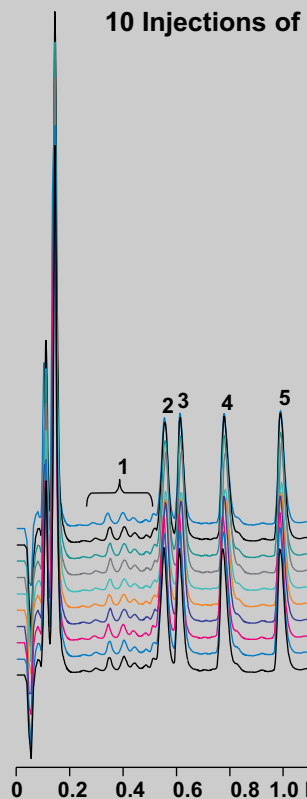
1. Albumin
2. IgG

**Column:** Exsil Pure 500 C18, 1.5µm, 10x2.0mm  
**Mobile Phase:** A: 0.1% Trifluoroacetic Acid in Water  
 B: 0.085% Trifluoroacetic Acid:n-Propanol(10:90)  
**Gradient:**

Time:	0	6.0	6.5	7.0
B:	5	75	75	5

  
**Flow Rate:** 0.5ml/min  
**Detector:** UV at 280nm

### 10 Injections of Synthetic Peptides



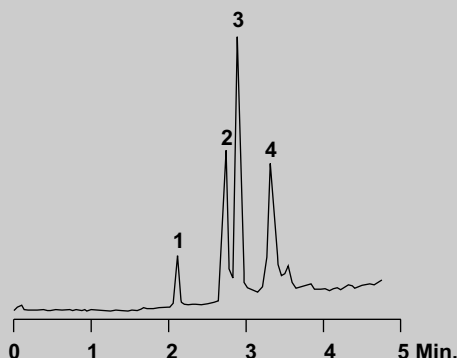
1. Contaminant Peptides/Impurities
2. RGAGGLGLGK-amide(883Da)
3. Ac-RGAGGLGLGK-amide(926Da)
4. Ac-RGVGGLGLGK-amide(954Da)
5. Ac-RGVVGLGLGK-amide(996Da)

**Column:** Exsil Pure 500 C18, 1.5µm, 10x2.0mm  
**Mobile Phase:** A: 0.1% Trifluoroacetic Acid in Water  
 B: 0.085% Trifluoroacetic Acid:Acetonitril (20/80)  
**Gradient:**

Time:	0	0.1	0.7	1.1	1.2
%B:	4	15	20	50	4

  
**Flow Rate:** 0.8ml/min  
**Detector:** UV at 215nm

# LC-MS of Proteins with Exsil Pure



1. Bovine Cytochrome C, M=12222(ave.)
2. Horse Apomyoglobin, M=16941(ave.)
3. Bovine Carbonic Anhydrase II, M=28998(ave.)
4. Chicken Ovalbumin, M=44455(ave.)

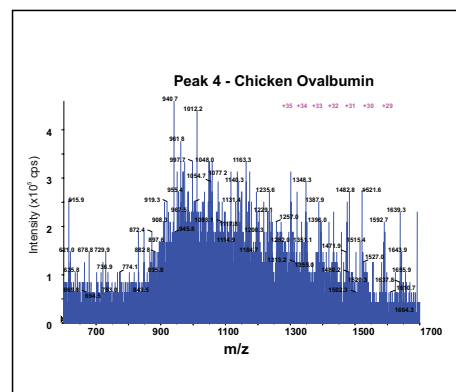
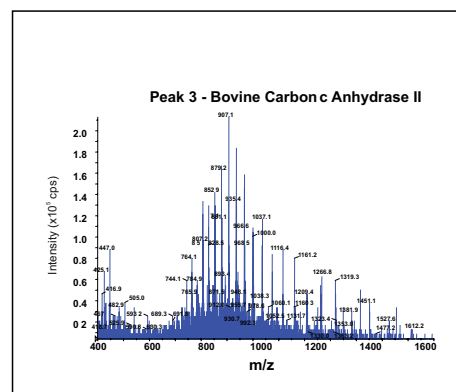
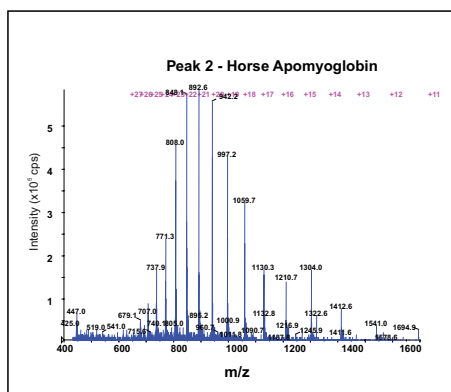
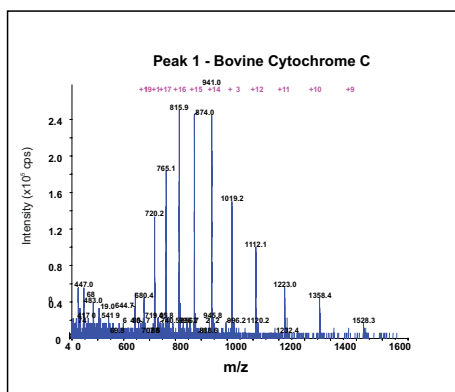
**Column:** Exsil Pure 500 C18 ,2.1x10mm  
**Mobile Phase:** A:0.2%Formic Acid,0.01%Trifluoroacetic Acid in Acetonitrile:Water(5:95)  
**Gradient:** B: 0.2%Formic Acid,0.01%Trifluoroacetic Acid in Acetonitrile:Water(80:20)  

<b>Time:</b>	0	4.0	4.5	4.7
<b>%B:</b>	20	90	90	20

**Flow Rate:** 0.4ml/min

**Detector:** AB/MDS Sciex Q TRAP® MS. EMSscan 400-1700 amu;  
 scan rate=1000amu/s; ion spray voltage=5000V;LIT fill time=50ms;  
 Q3 entry barrier=8V; declustering potential=20; collision energy=10eV;  
 curtain gas=50; ion source gas1= 45;ion source gas2=70;  
 temperature(TEM)=350°C.

**Injection Amount:** 50ng each



**Think Faster**

**Think Economic**

**Save Time!**

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