PRODUCT CATALOG

SELECTED

GALAK

PURSUE EXCELLENCE

Wuxi GALAK Chromatography Technology Co., Ltd

88th Meiliang Road
Wuxi City, Jiangsu, 214092
Mob: +86-1881-6200534
Tel: +86-0510-85992929
Fax: +86-0510-85104949
www.galaklc.com

GALAK Chromatography

Focus on Liquid Chromatography

Since 2009

We are continually developing new products to meet the needs of our customers.

For the complete GALAK product line including items not featured in this publication, please contact us directly or visit www.galaklc.com.

We are looking forward to helping you.

GALAK Chromatography

Wuxi GALAK Chromatography Technology Co, Ltd (GALAK) is a technology-driven enterprise established in 2009 by experienced liquid chromatography experts who worked in the US and Japan. GALAK's headquartered is located in Wuxi Bio-Park with over 1,500 sq.m. of R&D center. It's factory is located in Zhuhai city, Guangdong Province with over 3,000 sq.m. equipped with state-of-art instruments and equipment. During 14 years, GALAK has established over 20 proprietary intellectual property rights on chromatography products and biochemical purification technologies.

GALAK products include HPLC prepacked columns, liquid chromatography packing materials, HPLC hardware, industrial purification systems for normal phase, reversed-phase, ion-exchange and affinity chromatography applications. For HPLC prepacked columns and liquid chromatography packing materials, Galaksil® silica-gel materials are silica products with C18, C8, CN, NH2, phenyl. Sepromax® materials are based on the PS-DVB matrix to isolate and purify peptides, proteins, polysaccharides, and antibodies. Vircap® materials are PS-DVB matrix to isolate and purify virus molecules.

With extended experiences in biochemical purification, GALAK helped over 50 companies and laboratories to design and improve their biochemical purification processes. The projects involved monoclonal antibodies purification, peptides isolation, protein isolation, nature chemicals purification, enantiomers resolution and chromatography analysis.

"Innovation, Cooperation, Mutual benefits" are our philosophy.

GALAK is looking forward to work with you.

Product Portfolio

Prepacked Column

- Reversed-phase LC Column
- Normal-phase LC Column
- Absolut A Column

Chromatography Resin

- Galaksil Silica-gel Resin
- Protein A Affinity Resin
- Sepromax Ion-exchange Resin
- VirCap® Perfusion Resin
- VirCap® Oligo dT(25) Affinity Resin
- VirCap® InertShell Core-Shell Resin

Instrument & Accessories

- Column Packing System
- High-pressure Injection Pump
- Injection Loop
- Oligo Synthesis Column
- Glass Column
- HPLC Accessories

OUR TECHNOLOGY

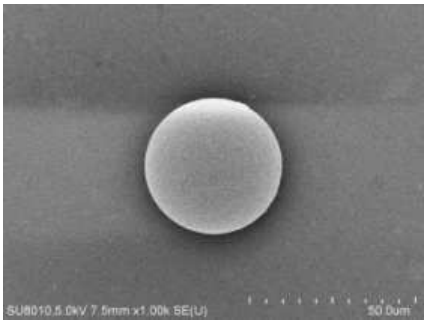
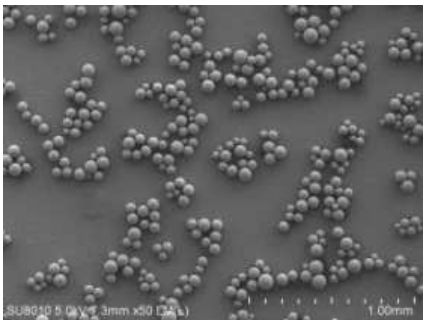
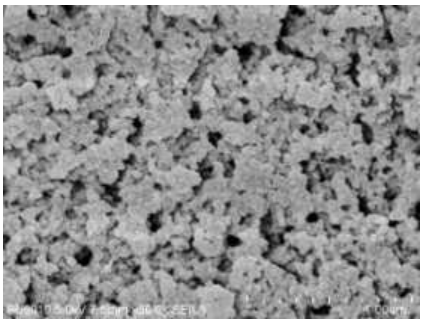
Substrate Particle

Substrate particles build the foundation of the mechanical and chemical stability in packing materials.

Sepromax® Polymer Particles

Sepromax® is a family of spherical divinylbenzene-styrenecopolymer (PS-DVB) particles designed for large-scale purification processes. With unique technologies, we precisely control their particle size, pore structure, pore size and surface area. Sepromax® particles have excellent mechanical properties and can withstand up to 10 MPa pressure. Their large pore sizes allow low mass transform of biom-acromolecules.

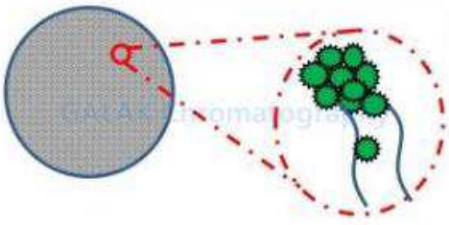
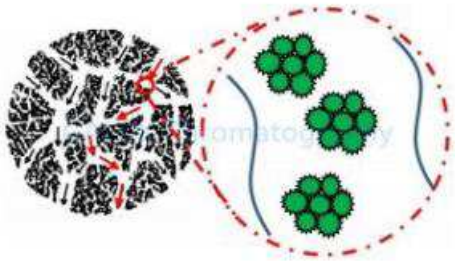
Optional: average particle size: 20/50/70/150 μm, pore size: 1000/2000/3000/5000A

Vircap® Polymer Particles

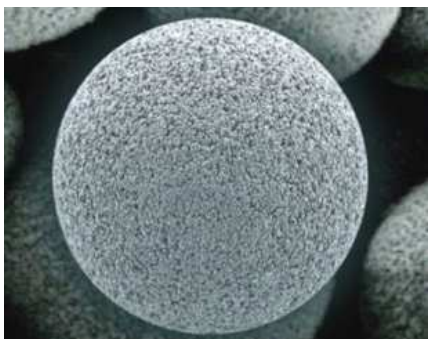
Vircap® is also a family of spherical divinylbenzene-styrenecopolymer (PS-DVB) particles which de-signed for virus molecules purification processes. Vircap® particles are developed from Sepromax® particles, the difference is that the Vircap® particles have much larger pore structures and “through-pores”. These large through-pores allow part of mobile phase to flow through, quickly carrying biomol-ecules to smaller diffusive pores.

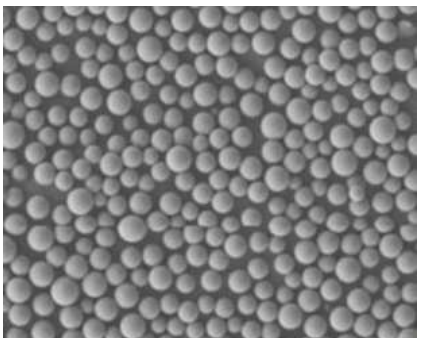
Optional: average particle size: 50/70/150 μm, pore size: 3000/5000A

Galaksil® Silica-gel Particles

Galaksil® is a well-established product series manufactured by innovative processes at industrial scales. It is a family of spherical, silica particles with tightly controlled particle size, pore structure and surface area.

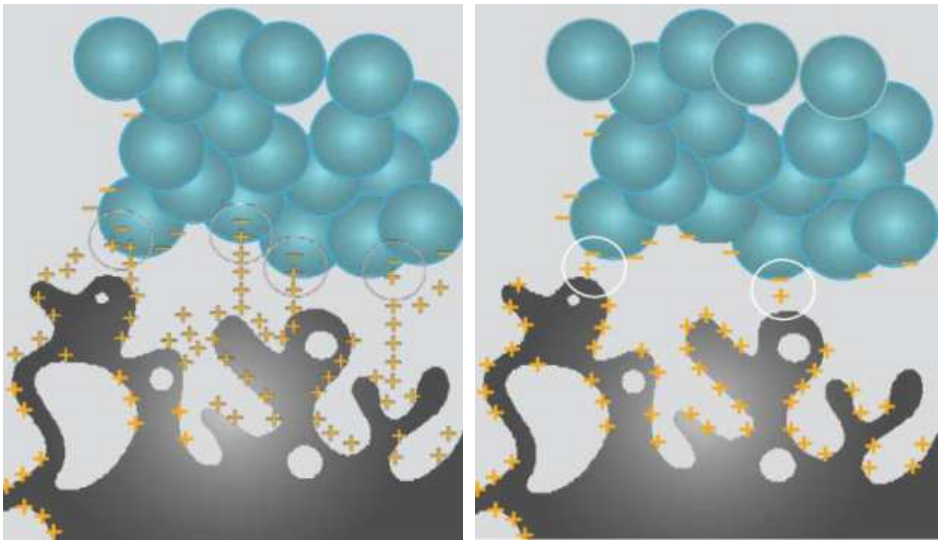




Ligand Bonding Technology

Functional groups or ligand on traditional packing materials are distributed along their surface. This limits their ability to effectively interact with bio-molecules. GALAK developed technologies to build “tentacle structure” on its ion-exchange and affinity packing materials. Flexible tentacle structures minimize the steric hindrance between functional groups or ligand and target molecules, improving the binding capability of the target molecules. Compared to traditional packing materials, GALAK’s PS-DVB particles show more effective capture and higher recovery.

Innovation Ligand Tentacle **Traditional Ligand**



Functional Groups

The functional group determines resin selectivity.

Common functional group classifications for silica-gel particles include reversed phase (RP), normal phase (NP), hydrophilic interaction chromatography (HILIC), ion-exchange (IEX), size exclusion chromatography (SEC), ion exclusion chromatography (ICE) and affinity chromatography (AC).

The functional group for PS-DVB particles include ion-exchange (IEX), and affinity chromatography (AC).

Affinity		
Recombinant Protein A	Sulfate Ester	dT-25mer
Cation-exchange		
Sulfonic Group S/SP	Strong Type	$-SO_3^{2-}$
Carboxymethyl CM	Weak Type	-COO
Anion-exchange		
Quaternary Ammonium Q	Strong Type	$-N^+(CH_3)_3$
Tertiary Amine D	Weak Type	$-N^+H(CH_3)_2$

We are GALAK Chromatography

At GALAK, customer service isn't just a department–it's who we are. We are sales and quality assurance professionals, technical support specialists, engineers and chemists. We are here to support customers every step of the way. GALAK is committed to delivering innovative products that provide optimal performance.

LC Prepacked Column

Sorbents

Instruments & Parts

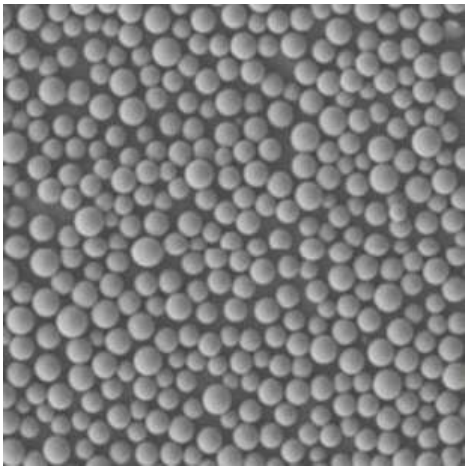
Prepacked Columns

Galaksil® prepacked columns are versatile HPLC columns based on the silica-gel for reversed-phase/normal phase chromatography. Galaksil® columns are made of spherical silica-gel particles which has low metal-ion content (<20 ppm in total), high specific surface area and high mechanical strength. With unique chemical bonding technique, our products have excellent stability and reproducibility. They can meet the highest requirements for analysis and preparative applications.

Advantages

- Low silanol activity
- Uniform ligand binding
- Low metal content
- Narrow particle size

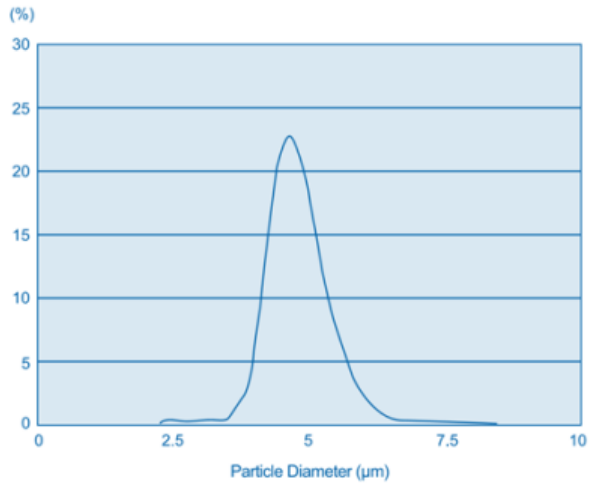




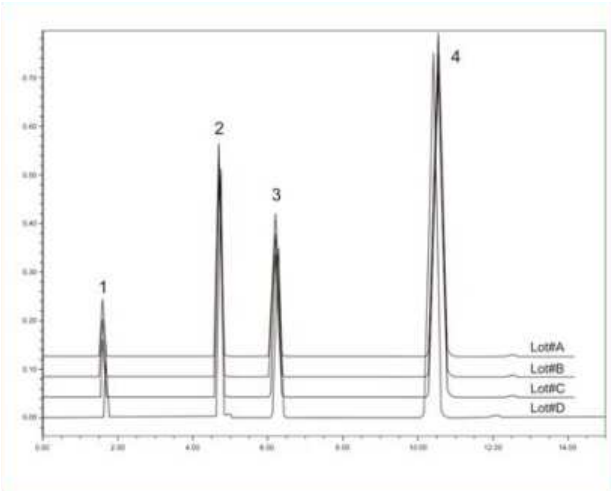
Customized Columns



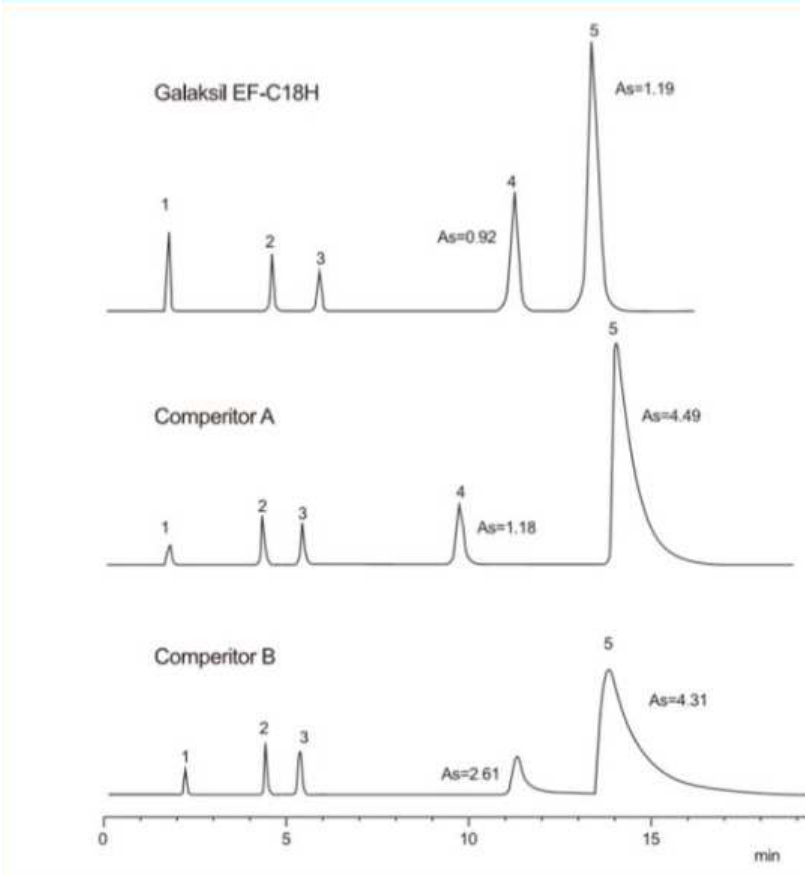
Distribution of particle size for Galaksil® C18 5μm



Repeated injection tests for Galaksil® C18 5μm



National Institute of Standards and Technology (NIST) ERM 870 Test



SRM 870 test

Column：Galaksil EF-C18H 150×4.6mmI.D

Eluent: 20mM Potassium Phosphate (pH7.0/ MeOH=20/80

Flow rate: 1.0mlL/min

Det.:UV254nm

Temp.:23C

1.Uracil

2.Toluene

3.Ethylbenzene

4.Quinizarin

5.Amitriptyline

Galaksil® C18H can use in alkali environment with high pH CIP（Clean-in-Place）process. The isolation of toluene and ethylbenzene test shows the uniformities of binding ligands on the silica-gel substrate.

Galaksil® Reversed-phase LC Columns

Galaksil® prepacked reversed-phase columns based on spherical silica-gel particles with very low metal-ion content (<20 ppm) in total, high specific surface area and high mechanical strength. Excellent base silica particles combined with unique chemical bonding technique ensures our products to have excellent stability and reproducibility. They can meet the highest requirements for analysis and preparative applications.

Advantages:

- Low silanol activity
- Uniform ligand binding
- Low metal content
- Narrow particle size
- Excellent stability

Products	Particle Size	Pore Size	Surface Area	Carbon Content	pH Range
C18M	3/5/8/10 um	120Å	330m^2/g	16%	2-8
C18H	5/8/10 um	120Å	330m^2/g	20%	2-11
C18L	5/10 um	120Å	330m^2/g	13%	2-8
C8	3/5/8/10 um	120Å	330m^2/g	12%	2-8
C4 Bio	5/10um	300Å	100m^2/g	3%	2-8
C8 Bio	5/10um	300Å	100m^2/g	5%	2-8
C18 Bio	5/10 um	300Å	100m^2/g	8%	2-8
Phenyl	3/5/10 um	140Å	300m^2/g	8%	2-8

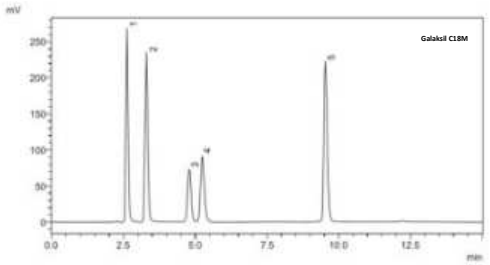
GALAK provide customized silica-gel sorbent, please contact us for details.

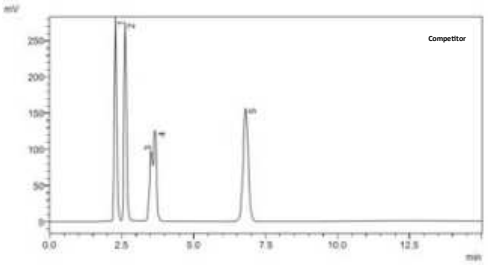
Galaksil® C18M

Parameters

Particle Size	Pore Size	Surface Area	Carbon Content	pH Range
3/5/8/10um	120Å	330m^2/g	16%	2-8

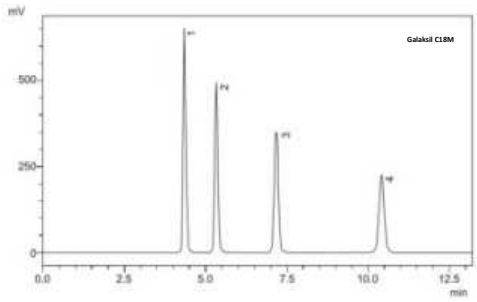
Application

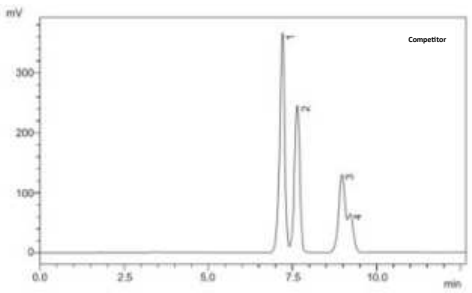




Nucleotide
Column: C18M 5μm 4.6×150mm
Competitor ODS 5μm 4.6×150mm
Mobile Phase:
phosphoric acid buffer / methyl alcohol
Flow Rate: 1ml/min
Wavelength: 254nm
Temp.: 25℃

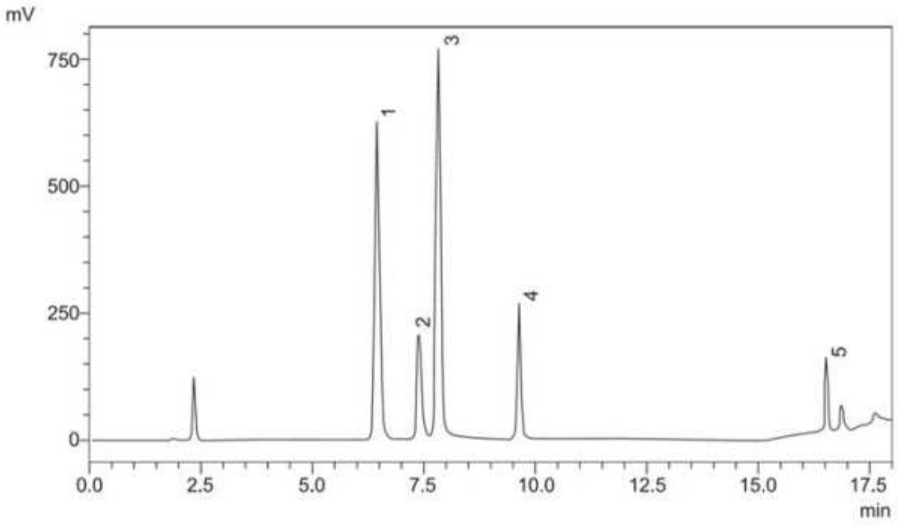
1 5′-cytidylic acid; 2 5′-uridylic acid;
3 5′-guanylic acid; 4 5′-inosinic acid;
5 5′-adenylic acid





Paraben
Column: EF-C18M 5μm
4.6×150mm
Competitor ODS 5μm
4.6×150mm
Mobile Phase: Water / methyl alcohol
Flow Rate: 1ml/min
Wavelength: 254nm
Temp.: 25℃

1 Methyl ester; 2 Ethyl ester;
3 Propyl ester; 4 Butyl ester



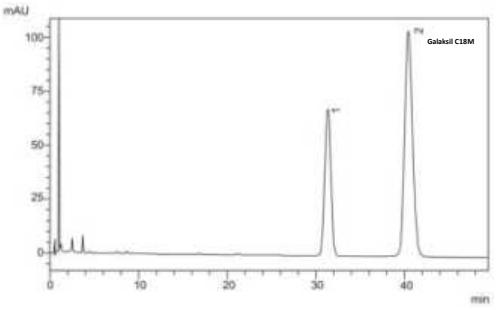
Water-soluble multivitamin
Column: C18M 5μm
4.6×150mm
Mobile Phase:
phosphoric acid buffer / acetonitrile
Flow Rate: 1ml/min
Wavelength: 210nm
Temp.: 25℃
1 Pyridoxine;
2 VB1;
3 Nicotinamide;
4 Folic acid;
5 VB2

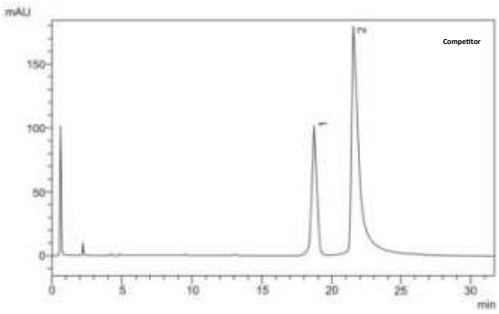
Galaksil® C18H

Parameters

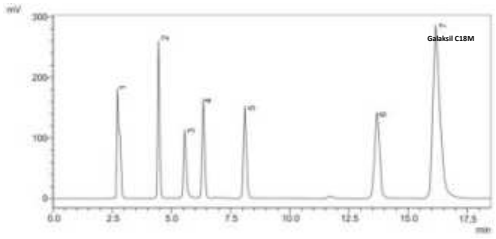
Particle Size	Pore Size	Surface Area	Carbon Content	pH Range
5/8/10um	120Å	330m^2/g	20%	2-11

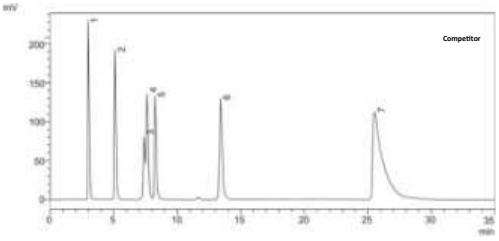
Application





Ibuprofen/Benzene ketone
Column: EF-C18H 5μm 4.6×150mm
Competitor 5μm 4.6×150mm
Mobile Phase:
phosphoric acid buffer / acetonitrile
Flow Rate: 2ml/min
Wavelength: 214nm
Temp.: 30℃

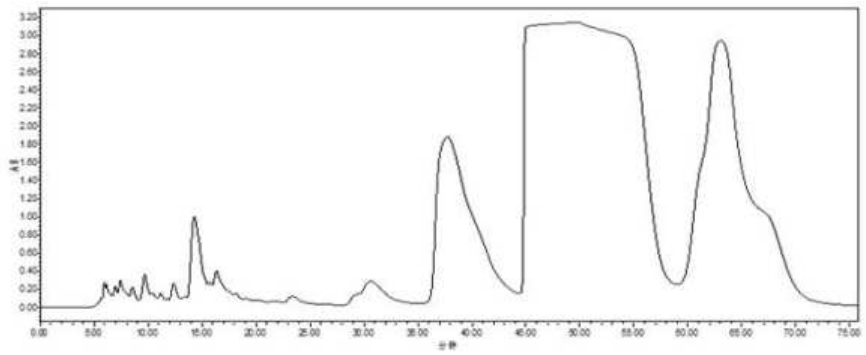




Polar/Nonpolar/ Neutral/Alkali Compounds
Column: EF-C18H 5μm 4.6×250mm
Competitor 5μm 4.6×250mm
Mobile Phase:
phosphoric acid buffer / methyl alcohol
Flow Rate: 1ml/min
Wavelength: 254nm
Temp.: 30℃

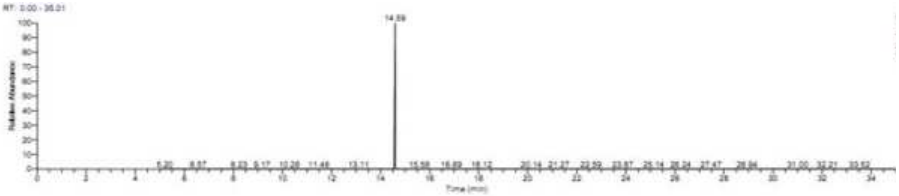
1 Uracil; 2 Butyl p-hydroxybenzoate;
3 Propranolol; 4 Di-propyl ortho-phthalate;
5 Naphthalene; 6 Acenaphthene;
7 Amitriptyline

The purification of EPA in fish oil



EPA in fish oil
Column: C18H 8μm
20×250mm
Sample: 90% EPA material

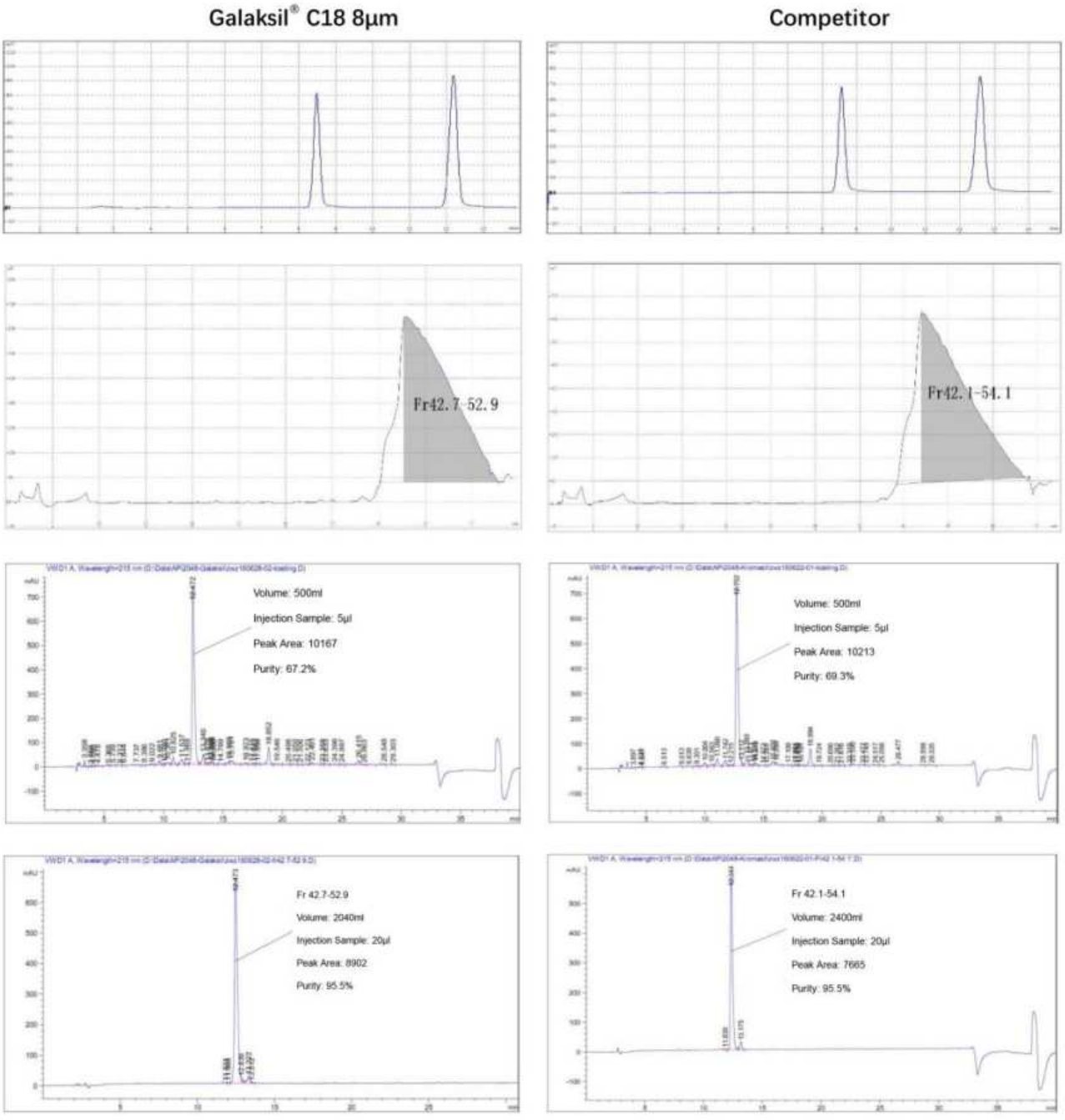
Finished sample
Purification: 99.7%



Peptides Purification Test

Galaksil® UP-C18H and the word-leading competitive product in a peptides purification study. The results show that the Galaksil® UP-C18H is similar to the competitive product.

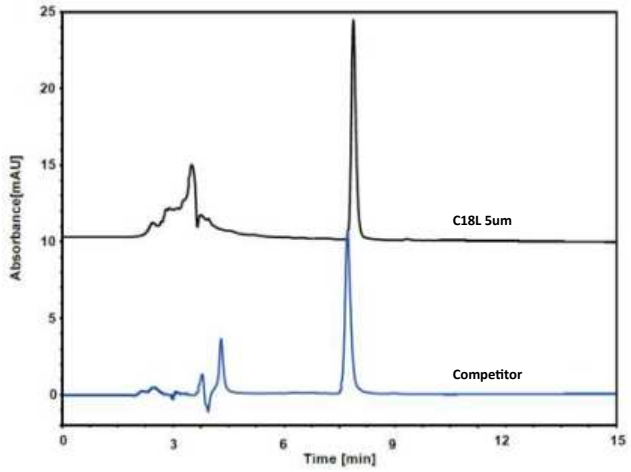
		Galaksil® C18	Competitor
Performance	Column Height (cm)	21.3	21.1
	Column Efficiency (TP)	70457	56935
Peptides	Injection Sample (g)	2.5	2.5
	Recovery (%)	89.3	90.0
	Purity(%)	95.5	95.5
	Freeze-dried product (g)	1.1302	1.1317



Galaksil® C18L

Parameters

Particle Size	Pore Size	Surface Area	Carbon Content	pH Range
5/10um	120Å	330m^2/g	13%	2-8



Tripeptide (5ppm)

Column: C18L 5μm 4.6×250mm

Mobile Phase: 70/30 v/v Water/ MeCN

Injection: 25μL

Flow Rate: 1ml/min

Wavelength: 220nm

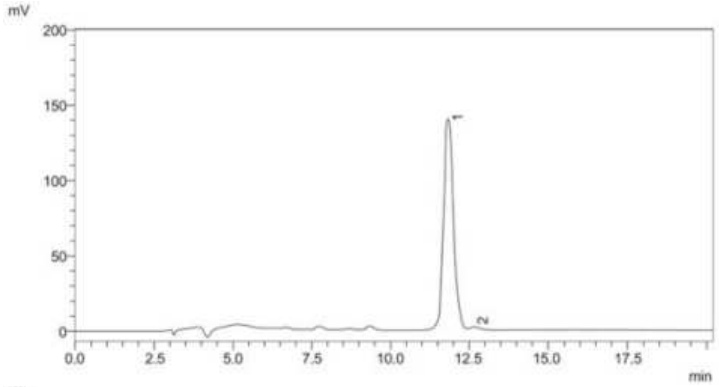
Temp.: 25℃

Galaksil® C8

Parameters

Particle Size	Pore Size	Surface Area	Carbon Content	pH Range
3/5/8/10um	120Å	330m^2/g	12%	2-8

Application



Orlistat

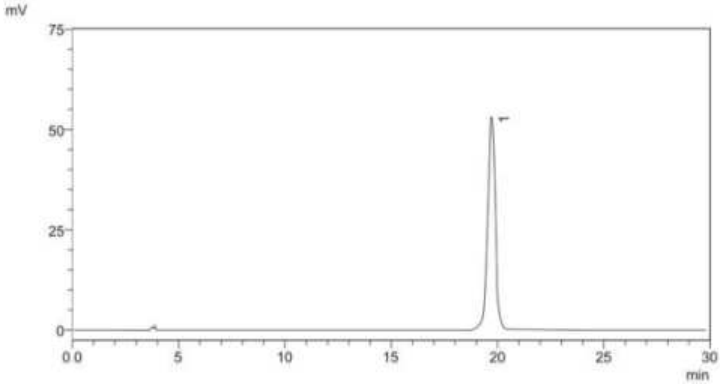
Column: C8 5μm 4.6×250mm

Mobile Phase: water / EtOH

Flow Rate: 1ml/min

Wavelength: 203nm

Temp.: 25℃



Omeprazole enteric-coated tablets

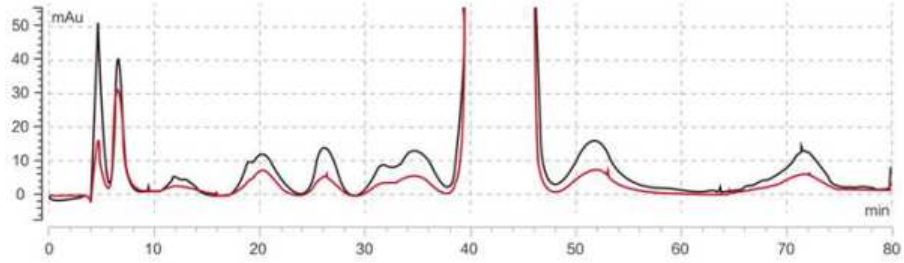
Column: C8 5μm 4.6×250mm

Mobile Phase: water / EtOH

Flow Rate: 1ml/min

Wavelength: 203nm

Temp.: 25 ℃



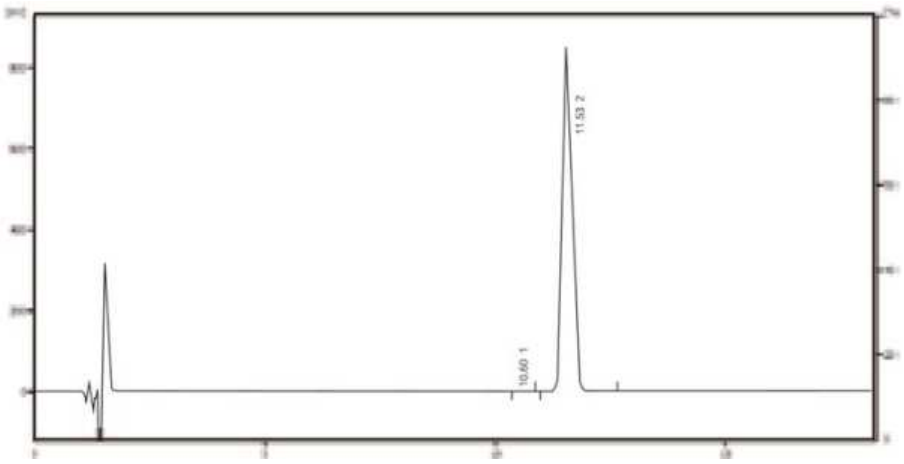
Orlistat

Column: EP-C8 10μm 10×250mm

Mobile Phase: EtOH solution

Flow Rate: 4ml/min

Wavelength: 195nm



Sample:

Dissolved raw material with methyl alcohol

Concentration: 50-60mg/ml

Finished sample

Purification: 99.8%

Single impurity < 0.1%

Recovery: ≥90%

Insulin

Column: C8 8μm 10×250mm

Time	A	B
0	85%	15%
5min	85%	15%
15min	64%	36%
225min	34%	66%

	Cycle	Injection	Purification	P1	P1c	P2
Galaksil® C8	1	100ml	99.76%	0.21%	0.02%	0.01%
		50ml	99.74%	0.22%	0.02%	0.02%
	2	50ml	99.75%	0.22%	0.02%	0.01%
	3	50ml	99.74%	0.22%	0.02%	0.01%
	4	50ml	99.74%	0.22%	0.02%	0.01%
	5	50ml	99.76%	0.21%	0.02%	0.01%
	6	50ml	99.75%	0.22%	0.02%	0.02%
	7	50ml	99.76%	0.21%	0.02%	0.02%
	8	50ml	99.74%	0.22%	0.02%	0.01%
	9	50ml	99.74%	0.22%	0.02%	0.02%

Galaksil® C4Bio

Parameters

Particle Size	Pore Size	Surface Area	Carbon Content	pH Range
5/10um	300Å	100m^2/g	3%	2-8

Galaksil® C8Bio

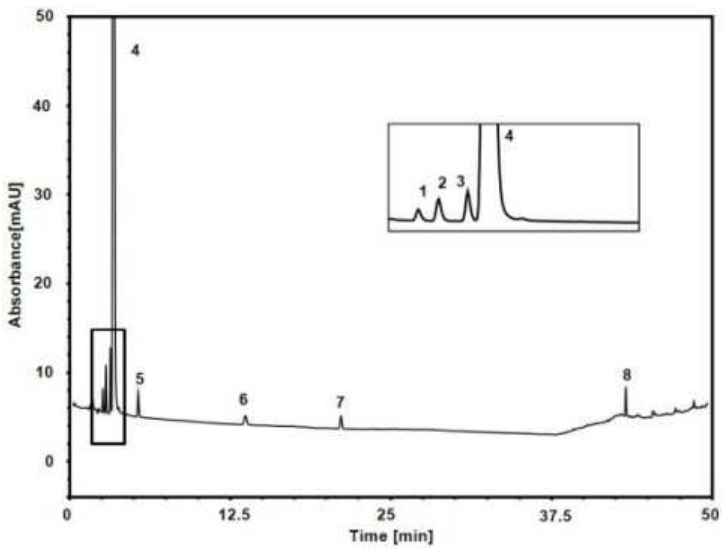
Parameters

Particle Size	Pore Size	Surface Area	Carbon Content	pH Range
5/10um	300Å	100m^2/g	5%	2-8

Galaksil® C18Bio

Parameters

Particle Size	Pore Size	Surface Area	Carbon Content	pH Range
5/10um	300Å	100m^2/g	8%	2-8



Riboviron
Column: C18Bio, 5 μm 4.6×150 mm
Mobile Phase:
A) Na_2SO_4, pH2.5;
B) 40/60 v/v MeCN/Na_2SO_4, pH2.5
Gradient:

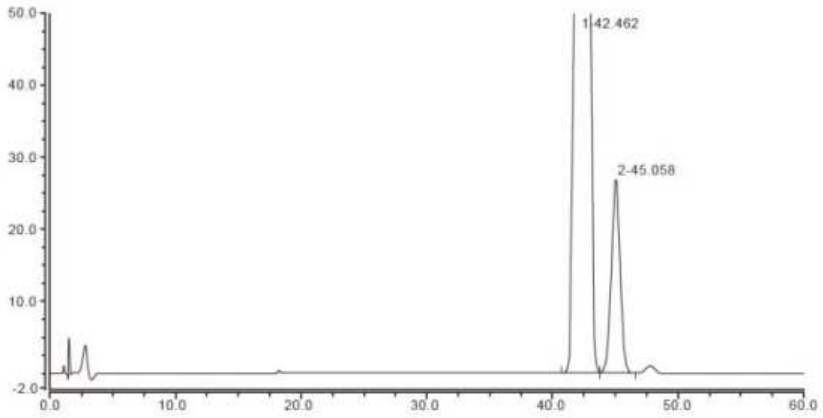
t (min)	%A	%B
0	100	0
15	100	0
25	87	13
35	87	13
50	0	100

Flow Rate: 1.0 mL/min
Temperature: 30℃
Injection: 10 μL
Detection: UV 220 nm
Peaks:
1. triazolinic acid;
2. Triazolamide;
3. Ribavirin acid;
4. Ribavirin;
5. Ribavirin 5 isomers;
6. Ribavirin methyl ester;
7. Ribavirin 5' - acetyl;
8. Ribavirin 5' - benzoyl

Galaksil® Phenyl

Parameters

Particle Size	Pore Size	Surface Area	Carbon Content	pH Range
5/10um	140Å	300m^2/g	8%	2-8



Roflumilast

Column: Phenyl 5μm 4.6×250mm

Mobile Phase: 60/40 v/v Water/MeCN

Injection: 10μL

Flow Rate: 1ml/min

Wavelength: 215nm

Temp.: 30℃

Order Information

	2.1-50mm	2.1-150mm	4.6-50mm	4.6-150mm
EF-C18M 3um	721-03012-002105	721-03012-002115	721-03012-004605	721-03012-004615

	4.6-150mm	4.6-250mm	10-250mm	20-250mm	30-250mm
EF-C18M 5um	721-05012-004615	721-05012-004625	721-05012-010025	721-05012-020025	721-05012-030025
EF-C18H 5um	722-05012-004615	722-05012-004625	722-05012-010025	722-05012-020025	722-05012-030025
EF-C18L 5um	723-05012-004615	723-05012-004625	723-05012-010025	723-05012-020025	723-05012-030025
EF-C8 5um	725-05012-004615	725-05012-004625	725-05012-010025	725-05012-020025	725-05012-030025
EF-C4Bio 5um	730-05012-004615	730-05012-004625	730-05012-010025	730-05012-020025	730-05012-030025
EF-C8Bio 5um	729-05012-004615	729-05012-004625	729-05012-010025	729-05012-020025	729-05012-030025
EF-C18Bio 5um	728-05012-004615	728-05012-004625	728-05012-010025	728-05012-020025	728-05012-030025
EF-Phenyl 5um	706-05012-004615	706-05012-004625	706-05012-010025	706-05012-020025	706-05012-030025

	4.6-250mm	10-250mm	20-250mm	30-250mm	50-250mm
EP-C18M 10um	721-10012-004625	721-10012-010025	721-10012-020025	721-10012-030025	721-10012-050025
EP-C18H 10um	722-10012-004625	722-10012-010025	722-10012-020025	722-10012-030025	722-10012-050025
EP-C8 10um	725-10012-004625	725-10012-010025	725-10012-020025	725-10012-030025	725-10012-050025
EP-C4Bio 10um	730-10012-004625	730-10012-010025	730-10012-020025	730-10012-030025	730-10012-050025
EP-C8Bio 10um	729-10012-004625	729-10012-010025	729-10012-020025	729-10012-030025	729-10012-050025
EP-C18Bio 10um	728-10012-004625	728-10012-010025	728-10012-020025	728-10012-030025	728-10012-050025

Galaksil® Normal-phase LC Columns

Galaksil® prepacked normal –phase columns are made of spherical silica-gel particles with very low metal-ion content (<20 ppm in total) , high specific surface area and high mechanical strength. With chemical bonding technique, our products have excellent stability and reproducibility. They can meet the highest requirements for analysis and preparative applications.

Advantages:

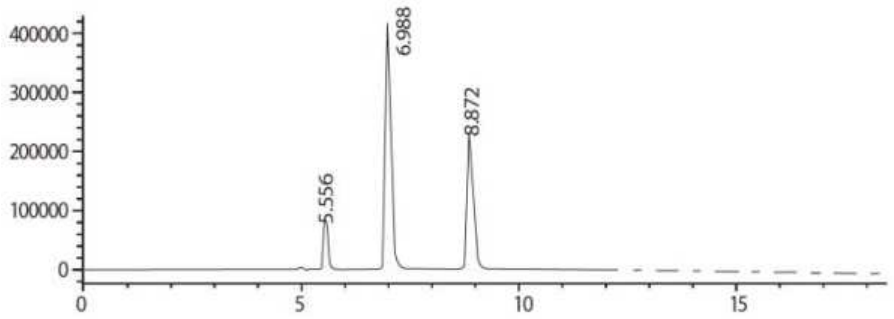
- Low silanol activity
- Uniform ligand binding
- Low metal content
- Narrow particle size
- Excellent stability

Products	Particle Size	Pore Size	Surface Area	Carbon Content	pH Range
SiO_2	3/5/8/10 um	120Å	330m^2/g	-	2-8
SiO_2 Bio	5 um	300Å	100m^2/g	-	2-8
NH_2	3/5/10 um	120Å	330m^2/g	5%	2-8
CN	3/5/10 um	120Å	330m^2/g	7%	2-8
Diol	5/10 um	120Å	330m^2/g	8%	2-8
Amide	5/10 um	120Å	330m^2/g	8%	2-8

Galaksil® SiO_2

Parameters

Particle Size	Pore Size	Surface Area	pH Range
3/5/10um	120Å	330m^2/g	2-8



Maleic Maleic Fumaric Acid
Column: Galaksil SiO2 5μm 4.6×250mm
Mobile Phase: N-hexane/THF/Trifluoroacetic acid = 650/350/1.2
Injection: 20μl
Flow Rate: 0.8ml/min
Wavelength: 255nm
Temp.: 30℃

Galaksil® SiO_2 Bio

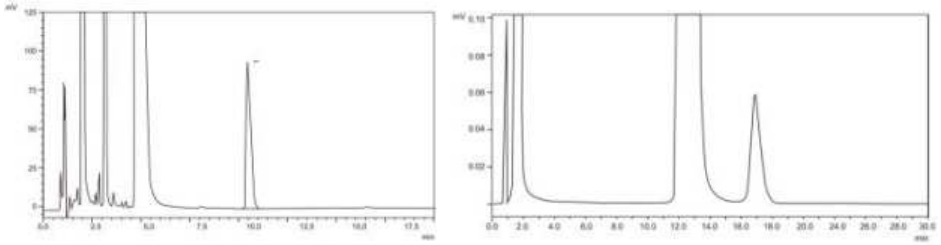
Parameters

Particle Size	Pore Size	Surface Area	pH Range
3/5/10um	120Å	330m^2/g	2-8

Galaksil® CN

Parameters

Particle Size	Pore Size	Surface Area	Carbon Content	pH Range
3/5/10um	120Å	330m^2/g	7%	2-8

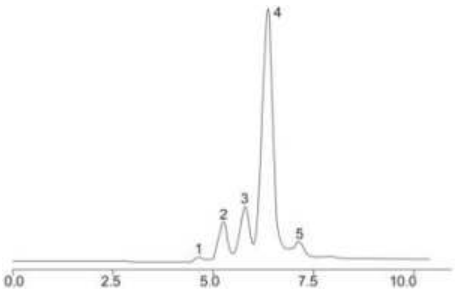


Benzalkonium Chloride
Column: Galaksil CN 5μm 4.6×150mm
Competitor CN 5μm 4.6×150mm
Mobile Phase: phosphate buffer / acetonitrile
Flow Rate: 2.0ml/min
Wavelength: 214nm
Temp.: 35℃

Galaksil® NH_2

Parameters

Particle Size	Pore Size	Surface Area	Carbon Content	pH Range
3/5/10um	120Å	330m^2/g	5%	2-8



Oligomaltose
Column: Galaksil NH_2 5μm 4.6×150mm
Mobile Phase: water/ acetonitrile
Flow Rate: 1ml/min
Detector: RID
Temp.: 40℃
Peak
1 glucose; 2 maltose; 3 maltodextrin;
4 maltotetraose; 5 maltopentaose

Galaksil® Diol

Parameters

Particle Size	Pore Size	Surface Area	Carbon Content	pH Range
5/10um	120Å	330m^2/g	8%	2-8

Order Information

	2.1-50mm	2.1-150mm	4.6-50mm	4.6-150mm
EF-SiO2 3um	720-03012-002105	720-03012-002115	720-03012-004605	720-03012-004615
EF-NH2 3um	705-03012-002105	705-03012-002115	705-03012-004605	705-03012-004615
EP-CN 3um	704-03012-002105	704-03012-002115	704-03012-004605	704-03012-004615

	4.6-150mm	4.6-250mm	10-250mm	20-250mm	30-250mm
EF-SiO2 5um	720-05012-004615	720-05012-004625	720-05012-010025	720-05012-020025	720-05012-030025
EF-NH2 5um	705-05012-004615	705-05012-004625	705-05012-010025	705-05012-020025	705-05012-030025
EF-CN 5um	704-05012-004615	704-05012-004625	704-05012-010025	704-05012-020025	704-05012-030025
EF-Phenyl 5um	706-05012-004615	706-05012-004625	706-05012-010025	706-05012-020025	706-05012-030025
EF-Diol 5um	707-05012-004615	707-05012-004625	707-05012-010025	707-05012-020025	707-05012-030025

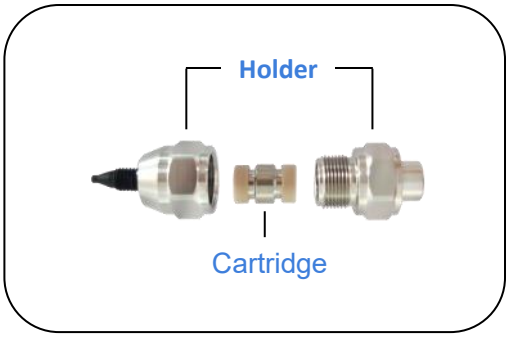
	4.6-250mm	10-250mm	20-250mm	30-250mm	50-250mm
EP-SiO2 10um	720-10012-004625	720-10012-010025	720-10012-020025	720-10012-030025	720-10012-050025

Guard Columns

Cartridge + Holder

Size: 4.6-10mm, 10-10mm, 20-10mm

Packing material: matched with prepacked columns



Precolumns

Size: 4.6-50mm, 10-30mm, 10-50mm, 20-30mm, 20-50mm, 30-50mm, 50-50mm

Packing material: matched with prepacked columns

AbSolut® A Column

AbSolut® A column is designed for fast analysis of monoclonal antibody (mAb) concentration (titer) with protein A affinity chromatography. Alkali resistant recombinant Protein A (rProtein A) ligand used in this product has specific binding ability to the Fc region of immunoglobulins. The matrix of AbSolut® A is PS-DVB (Polystyrene Divinylbenzene) particles, which are highly cross-linked for enhanced mechanical stability and particle strength. Compared to agarose base, hydrophilic PS-DVB particles have higher pressure stability, dynamic binding capacity (DBC) and longer lifetime. Hence, AbSolut® A is an excellent choice for mAbs titer analysis.

Advantages

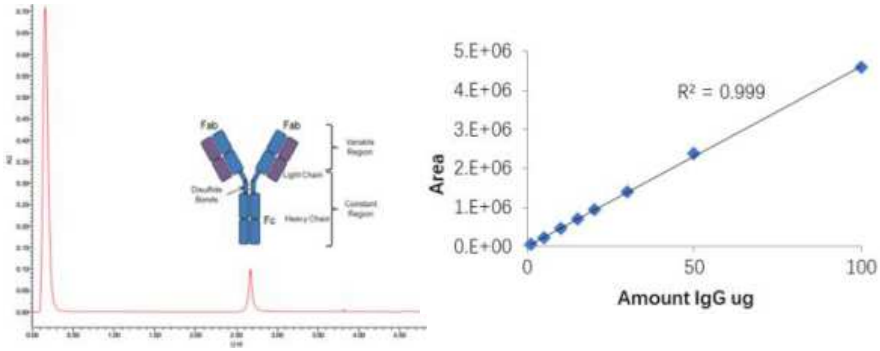
- Direct use on HPLC instruments
- High dynamic binding capacity, quick mass transfer
- Minimum nonspecific absorption, accurate determination
- Fast analysis cycle time: 2–5 minutes
- Satisfactory linearity in wide concentration range: 0.02-10 mg/ml
- Long lifetime
- Alkali resistance: 0.1-0.5 M NaOH cleaning conditions

Parameter

	AbSolut® A	AbSolut® A Plus
Column Size	2.1mm ID × 30mm L; 4.6mm ID × 50mm L	
Column Tube Material	316L Stainless steel, PEEK	
Support Matrix	Polystyrene Divinylbenzene (PS-DVB)	
Ligand	Recombinant Protein A	
Particle Size	30μm	20μm
Shipping Solution	0.02 M sodium phosphate, pH 7.0, 0.02% sodium azide	
pH range	pH 2-10	
Maximum Pressure	1000 psi	
Cleaning Agents	0.1-0.5M NaOH	
Cycle Time	2-5 minutes	
Temperature Stability	4-40 °C	

Excellent Linearity

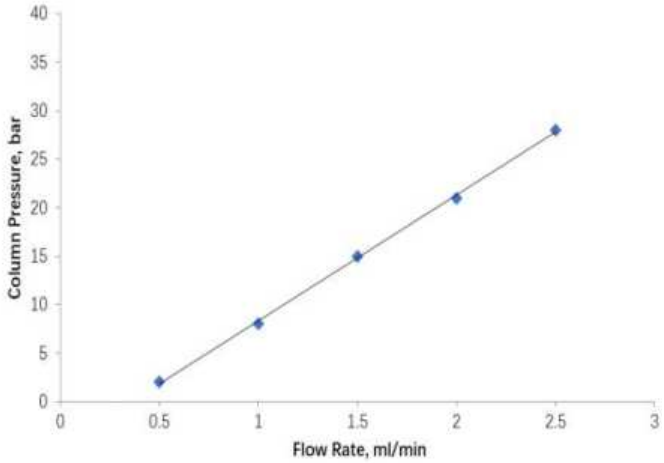
Quantitative analysis for antibody fermentation broth by Absolut® A.



Column: Absolut A 2×30mm
Eluent A: 20mM PB, 150mM NaCl, pH7.4
Eluent B: 0.1%HCl, 150mM NaCl
Gradient: 0% B for 1.0 min, 100% B for 2.0 min, 0% B for 2.0 min
Flow rate: 1ml/min
Sample: mAb

Flow Rate and Pressure

The operating flow rate is 0.5-3 ml/min as recommended for HPLC system.



Column: AbSolut A, 2.0×30mm

Eluent A: 20mM PB, 150mM NaCl, pH7.4

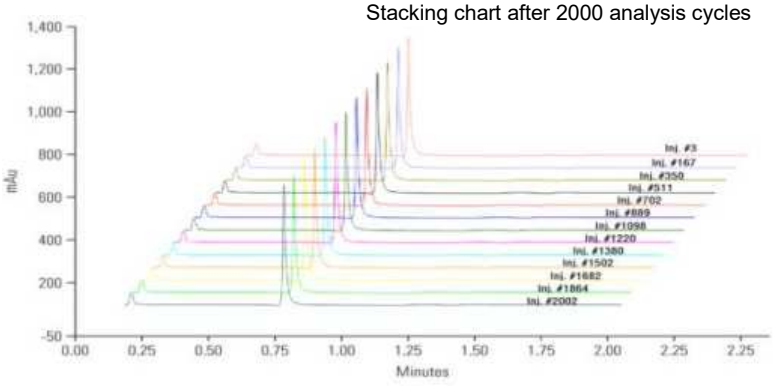
Eluent B: 0.1%HCl, 150mM NaCl

Temp: 25 ℃

System: Waters 1525 pump

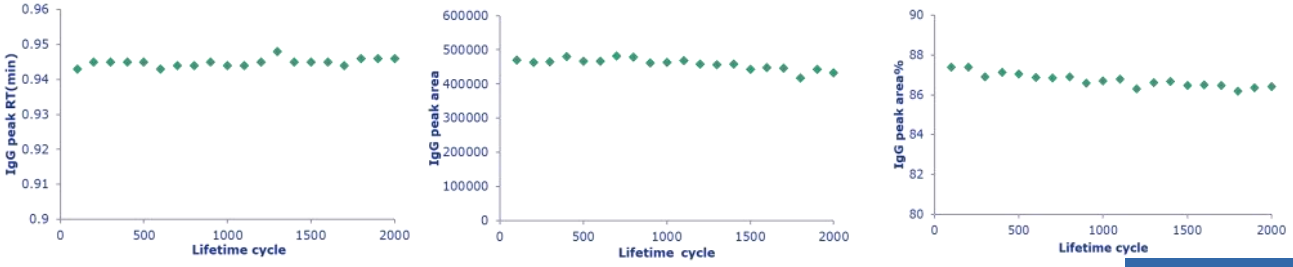
Long Lifetime

Stacking chart after 2000 analysis cycles



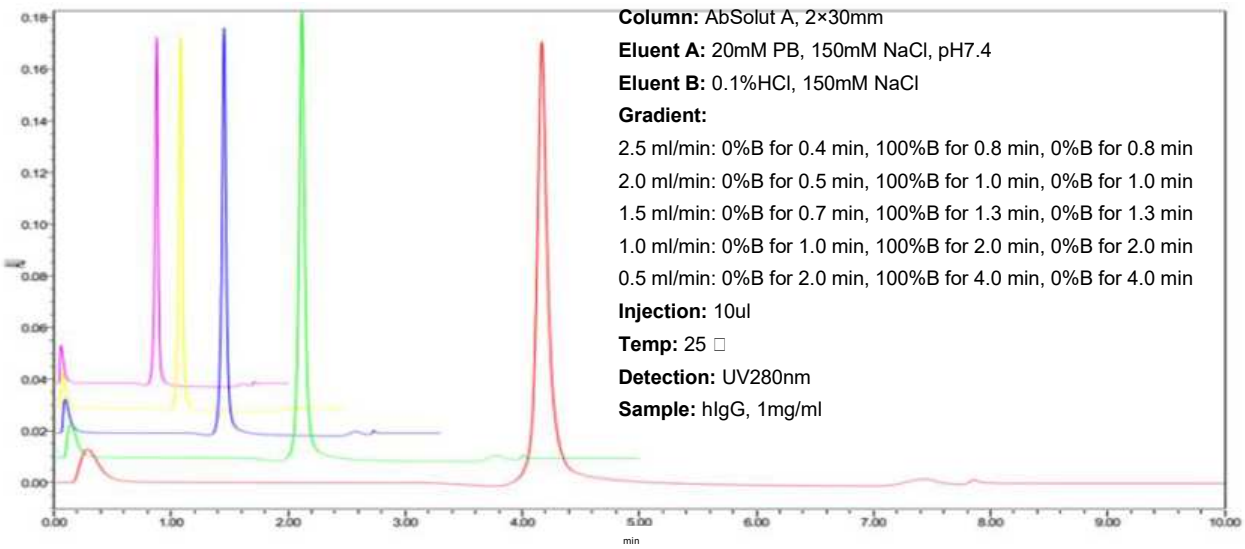
Column	AbSolut A, 2×30 mm
Eluent A	50 mM Sodium Phosphate, 150 mM NaCl, pH 7.0
Eluent B	0.1% HCl, 150 mM NaCl, pH 1.9
Flow Rate	2.0 ml/min
Gradient	0% B for 0.2 min, 100% B for 0.60 min, 0% B for 1.20 min
Temperature	25℃
Detection	280 nm
Injection volume	10 uL
Sample	hIgG, 1 mg/mL

Statistical analysis of data demonstrates

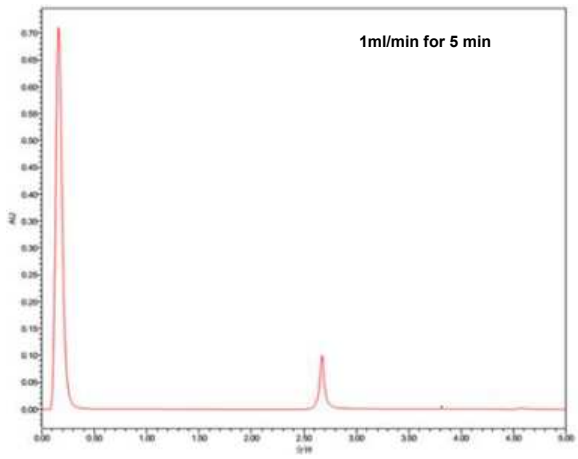


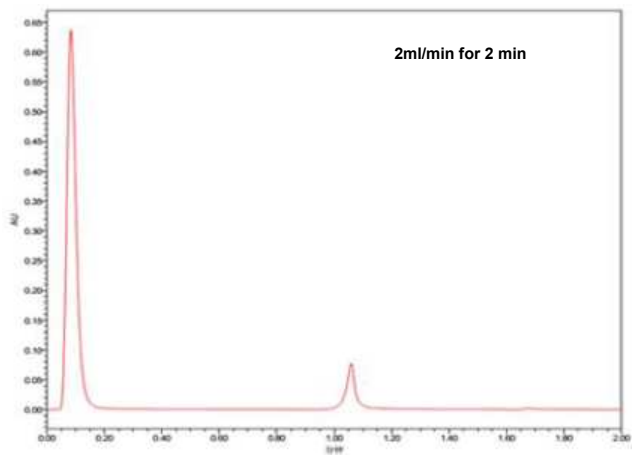
Flexible Choice of Flow Rate

The ratio of bounded and unbounded IgG has almost no effect on the flow rate.



Normally, the flow rate is 1ml/min for 5 min analysis. Large samples, 2ml/min for 2 min analysis.



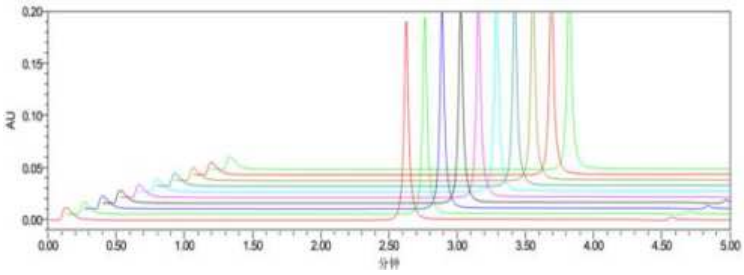


Flow rate ml/min	Total Area	Unbound Area	Unbound Relative Area %	IgG Area	IgG Relative Area %
0.5	1459568	145807	9.99	1313761	90.01
1.0	743661	75069	10.09	668592	89.91
1.5	492377	49715	10.01	442662	89.90
2.0	376354	39877	10.06	336477	89.40
2.5	322735	32984	10.22	289751	89.78

Stability Test

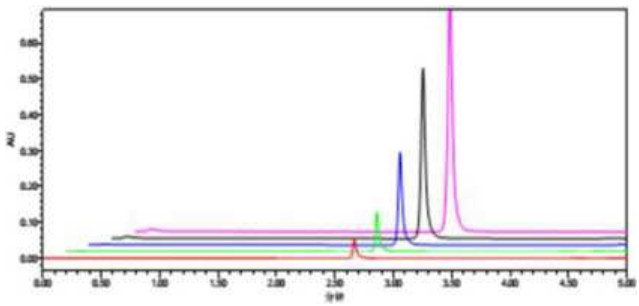
Performance test for 10 different batches.

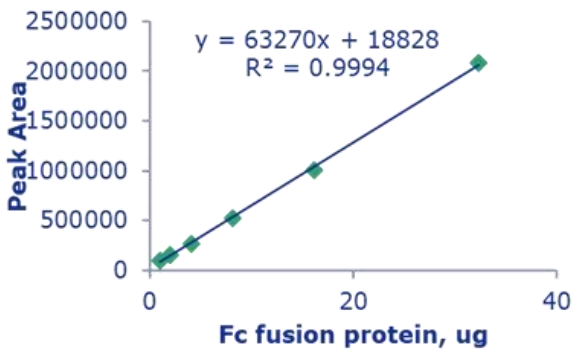
No.	RT (min)	Peak Area	Peak Height	TP	As
1	2.652	537586	190057	29507	1.10
2	2.641	536434	187236	26529	1.21
3	2.602	533688	186841	27349	1.12
4	2.599	531408	188244	29147	1.05
5	2.622	534911	187224	26901	0.98
6	2.647	540382	188746	26862	1.19
7	2.626	531906	188743	27855	1.08
8	2.628	540015	189618	28034	1.11
9	2.610	541372	188711	26567	1.16
10	2.623	527072	185477	26420	1.20



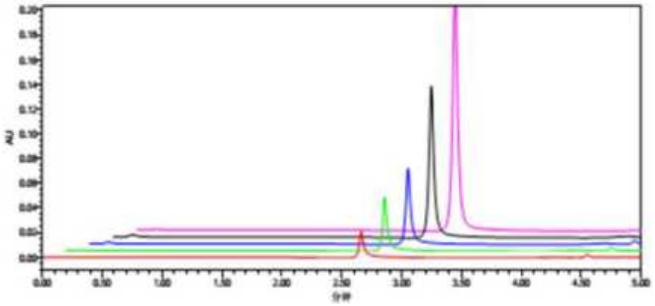
Application Cases

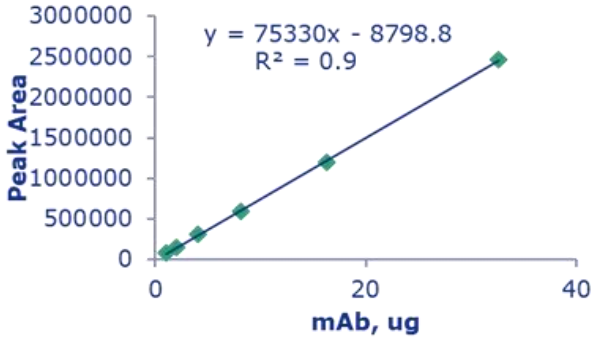
Fc Fusion Protein sample





Monoclonal antibody sample





Order Information

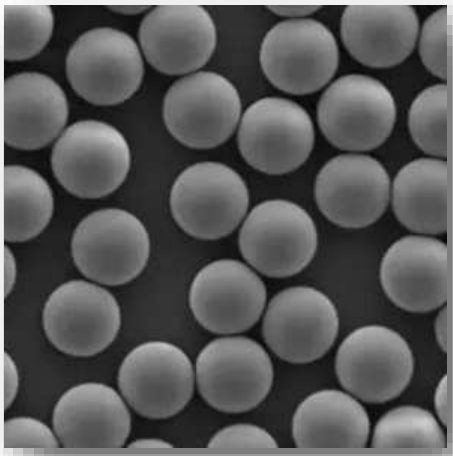
Particle Size	Column Size	Stainless Steel Column	PEEK Column
Absolut A	2.1* 30mm	1107-30-02003S	1107-30-02003P
	4.6*50mm	1107-30-04605S	1107-30-04605P
Absolut A PLUS	2.1* 30mm	1107-20-02003S	1107-20-02003P
	4.6*50mm	1107-20-04605S	1107-20-04605P

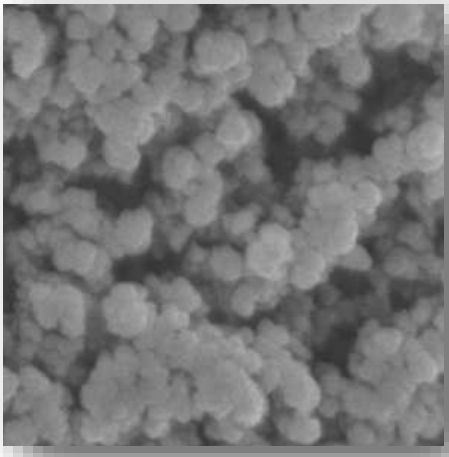
Sorbents

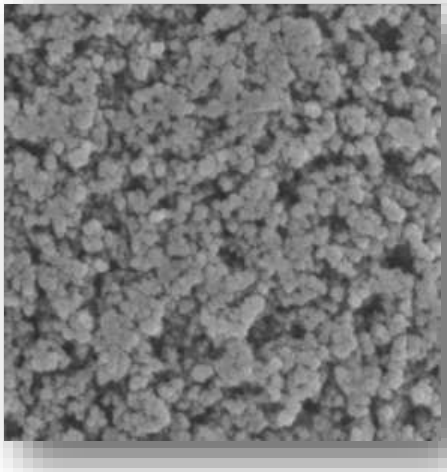
With medium and large production lines, GALAK has the capacity for 300kg/liter to 800kg/liter per month of silica-gel packing materials and PS-DVB particles. We can meet production demand from pharmaceutical factories to laboratories. To satisfy customers needs, we also provide customized particles (particle size, pore size, ligand) based on specific technical requirements.

Products:

- Galaksil silica-gel packing materials
- Sepromax® A50 for protein A affinity chromatography
- Sepromax® Polystyrene/divinylbenzene (PS-DVB) resin (Antibodies over 160kDa, other big protein molecules)
- VirCap® Polystyrene/divinylbenzene (PS-DVB) resin (capsule membrane virus and other virus for vaccines)
- VirCap® Oligo dT(25) Affinity Resin (mRNA purification)







Reversed-phase Chromatography

Analysis Silica-gel Packing Materials

Products	Particle Size	Pore Size	Surface Area	Carbon Content	pH Range	End-caped
EF-C18	3 um	120Å	330m^2/g	16%	2-8	Yes
EF-C18M	5 um	120Å	330m^2/g	16%	2-8	Yes
EF-C18M	8 um	120Å	330m^2/g	16%	2-8	Yes
EF-C18M	10 um	120Å	330m^2/g	16%	2-8	Yes
EF-C18H	5 um	120Å	330m^2/g	20%	2-11	Yes
EF-C18H	10 um	120Å	330m^2/g	20%	2-11	Yes
EF-C18L	5 um	120Å	330m^2/g	13%	2-8	Yes
EF-C8	8 um	120Å	330m^2/g	12%	2-8	Yes
EF-C8	10 um	120Å	330m^2/g	12%	2-8	Yes
EF-C4 Bio	5 um	300Å	100m^2/g	3%	2-8	Yes
EF-C4 Bio	10 um	300Å	100m^2/g	3%	2-8	Yes
EF-C8 Bio	5 um	300Å	100m^2/g	5%	2-8	Yes
EF-C8 Bio	10 um	300Å	100m^2/g	5%	2-8	Yes
EF-C18 Bio	5 um	300Å	100m^2/g	8%	2-8	Yes
EF-C18 Bio	10 um	300Å	100m^2/g	8%	2-8	Yes
EF-Phenyl	5 um	120Å	330m^2/g	8%	2-8	Yes
EF-Phenyl	10 um	120Å	330m^2/g	8%	2-8	Yes

Preparative Silica-gel Packing Materials

Products	Particle Size	Pore Size	Surface Area	Carbon Content	pH Range	End-caped
EP-C18	20 um	120Å	330m^2/g	16%	2-8	Yes
EP-C18	30 um	100Å	330m^2/g	16%	2-8	Yes
EP-C18	50 um	120Å	330m^2/g	16%	2-8	Yes
EP-C18	75 um	120Å	330m^2/g	16%	2-8	Yes
EP-C8	20 um	120Å	330m^2/g	12%	2-8	Yes
EP-C8	30 um	100Å	330m^2/g	12%	2-8	Yes
EP-C8	50 um	120Å	330m^2/g	12%	2-8	Yes
EP-C8	75 um	120Å	330m^2/g	12%	2-8	Yes

Normal-phase Chromatography

Analysis Silica-gel Packing Materials

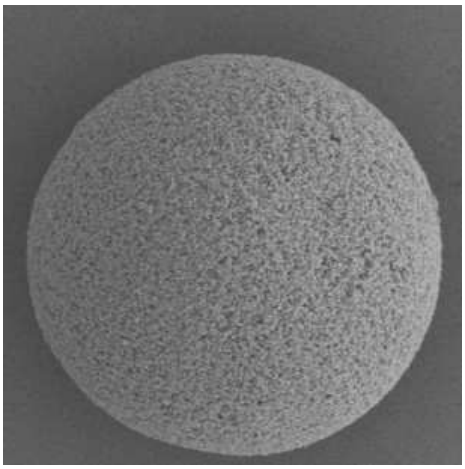
Products	Particle Size	Pore Size	Surface Area	Carbon Content	pH Range	End-capped
EF-SiO_2	3 um	120Å	330m^2/g	-	2-8	-
EF-SiO_2	5 um	120Å	330m^2/g	-	2-8	-
EF-SiO_2	7 um	120Å	330m^2/g	-	2-8	-
EF-SiO_2	10 um	120Å	330m^2/g	-	2-8	-
EF-SiO_2	5 um	80Å	330m^2/g	-	2-8	-
EF-SiO_2	5 um	100Å	330m^2/g	-	2-8	-
EF-SiO_2	10 um	200Å	330m^2/g	-	2-8	-
EF-SiO_2	5 um	300Å	330m^2/g	-	2-8	-
EF-SiO_2	10 um	300Å	330m^2/g	-	2-8	-
EF-NH_2	5 um	120Å	330m^2/g	5%	2-8	Yes
EF-NH_2	10 um	120Å	330m^2/g	5%	2-8	Yes
EF-CN	5 um	120Å	330m^2/g	7%	2-8	Yes
EF-CN	10 um	120Å	330m^2/g	7%	2-8	Yes
EF-Diol	5 um	120Å	330m^2/g	8%	2-8	Yes
EF-Diol	10 um	120Å	330m^2/g	8%	2-8	Yes

Preparative Silica-gel Packing Materials

Products	Particle Size	Pore Size	Surface Area	Carbon Content	pH Range	End-capped
EF-SiO_2	20 um	120Å	330m^2/g	-	2-8	-
EF-SiO_2	30 um	100Å	330m^2/g	-	2-8	-
EF-SiO_2	50 um	120Å	330m^2/g	-	2-8	-
EF-SiO_2	75 um	120Å	330m^2/g	-	2-8	-

Sepromax®A50

Sepromax® A50 is designed for analysis and purification of monoclonal antibodies (mAbs). Compared to traditional agarose media Sepromax® A50 has the advantages of high dynamic binding capacity (DBC), long life time, and less shedding of ligand. NaOH (0.1-0.5M) can be used for clean-in-Place (CIP) .



The ligand of Sepromax® A50 is recombinant protein A (rProtein A) immobilized on the surface of macro-porous PS-DVB microsphere substrate. The rProtein A has better alkali-resisting ability that ensures stability in high pH conditions. With our hydrophilic treatment and coupling technology, we eliminated non-specific binding PS-DVB surface. Hence, Sepromax® A50 is extremely useful for purification process of monoclonal antibodies.

Advantages:

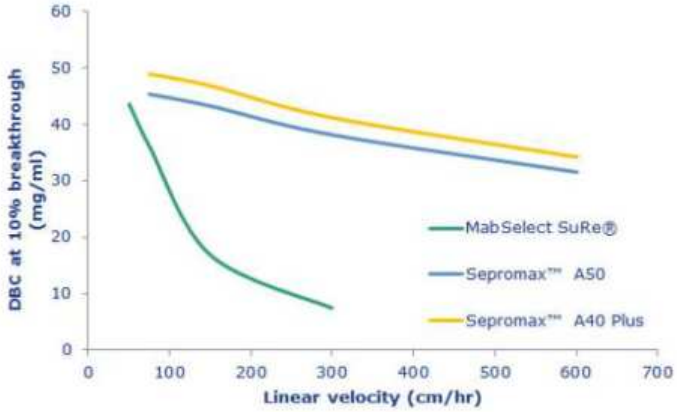
- High rigidity, low backpressure, suitable for small-scale and large-scale mAb purification
- Outstanding high dynamic binding capacity at low residence time
- Excellent alkali resistance, 0.1-0.5 M NaOH for CIP
- Long lifetime, low ligand leakage
- High batch stability

Parameter

Support Matrix	Poly(styrene/divinylbenzene) (PS-DVB)
Ligand	Recombinant Protein A
Ave. Particle size	50μm
Dynamic Binding Capacity (DBC)	Approx. 40 mg human IgG/ml media (Determined at 10% breakthrough by frontal analysis at a mobile phase velocity of 500 cm/h in a column with a bed height of 5 cm, Residence time 0.6 min)
Shrinkage/Swelling	< 1% from 1-100% organic solvent
pH range (Long term)	pH 2-10
Maximum Operating Pressure	1500 psi (100 bar / 10 MPa)
Cleaning Agents	0.1-0.5M NaOH
Temperature Stability	4-40 °C
Delivery Conditions	20% ethanol (2-8℃)

DBC vs. Linear Flow Rate Curve

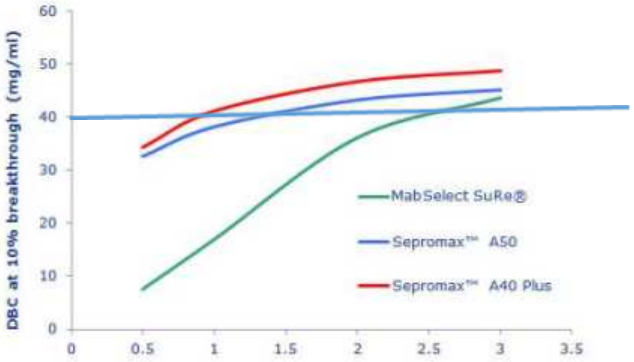
DBC of Sepromax® A50 do not decrease with the increased flow rate.



Condition	
System:	AKTA® Purifier10
Buffer:	20 mM PB, 0.15 M NaCl pH 7.4
Eluant:	0.1 M Gly-HCl, pH 2.5
CIP Solvent:	0.5 M NaOH
Sample:	1.0 mg/ml hIgG

DBC vs. Residence Time Curve

Column efficiency of Sepromax® A50 is much higher compared to competitive products.



DBC=40 mg/ml, RT=1.3 min (Sepromax® A50), RT=2.4min (competitive product).

Column height=10cm, F =460cm/h (Sepromax® A50), F =250 cm/h (competitive product).

F=300 cm/h, H=6.5cm (Sepromax® A50), H =12 cm (competitive product).

$$RT = \frac{H \times 60}{F}$$

Note: *Because of the difference of columns, residence time (RT) is more suitable for DBC description. F is for flow rate, H is for column height.*

DBC in High Sample Concentration

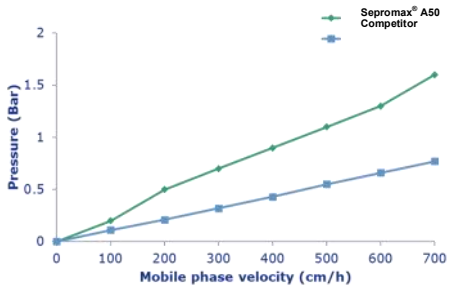
DBC of Sepromax® A50 is about 20-50% higher than competitive product with high IgG concentration injection under 2 minutes residence time (RT).

Test Condition	
Sample:	hIgG
Column:	7 mm I.D. x 2.5 cm (1mL)
Condition:	0.02 mol/L Na_3PO_4 buffer (pH 7.4) + 0.15 mol/L NaCl
DBC:	Base on breakthrough curve (allow 5% leakage)

Residence time (min)	Flow rate (ml/min)	DBC @ 5% BT			
		IgG conc. at 5g/L		IgG conc. at 10g/L	
		Sepromax® A50	Competitor	Sepromax® A50	Competitor
1.92	0.5	30.3	27.4	30.3	24.5
0.96	1.0	26.8	15.3	26.7	14.5
0.64	1.5	23.2	9.8	23.4	10.8

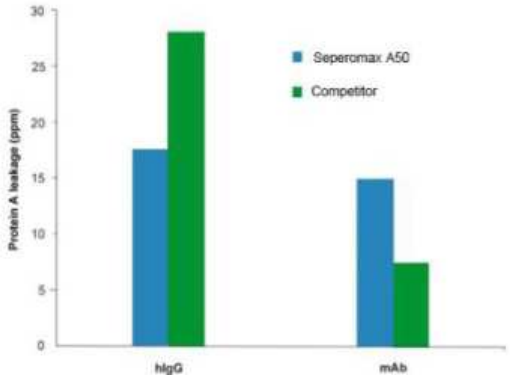
Pressure vs. Flow Rate Curve

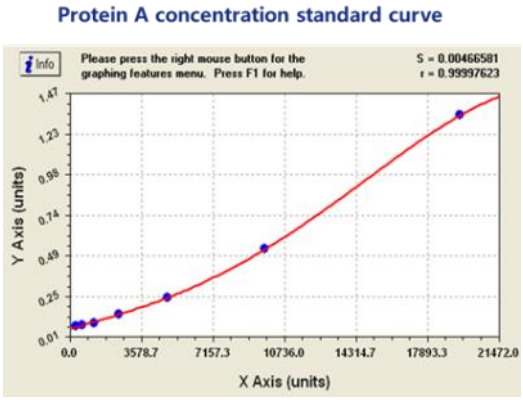
The back pressure of Sepromax® A50 is less than competitive product. Sepromax® A50 is more suitable for industrial purification process.



Protein A Ligand Leakage Test (ELISA)

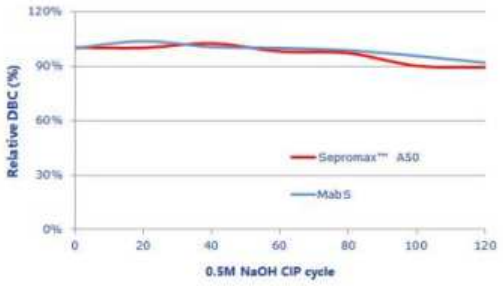
Samples: 20mg hIgG/ml-resin, 9mg mAb/ml-resin； ELISA test: Cygnus F400 kit





NaOH Clean-in-Place Test

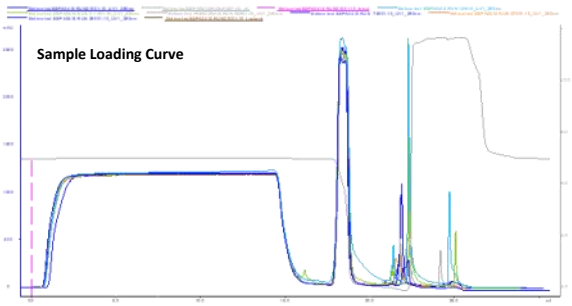
After 120 cycles of 0.5M NaOH CIP, the relative DBC is still stay in high level.

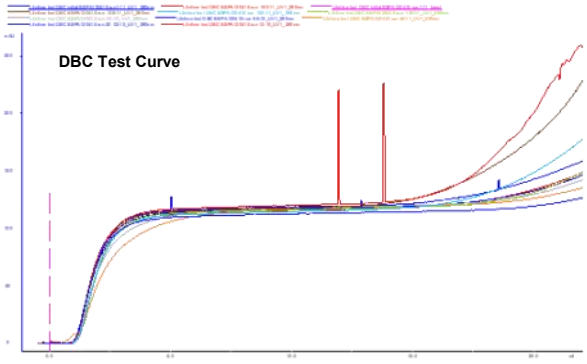


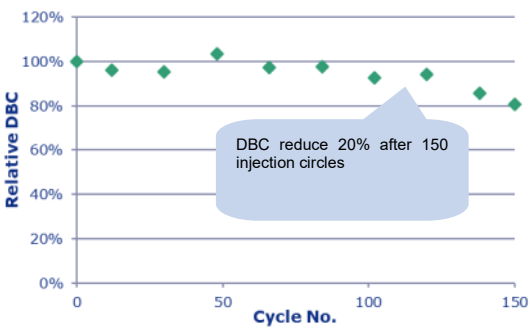
Alkali Resistance Test (150 Cycle Lifetime)

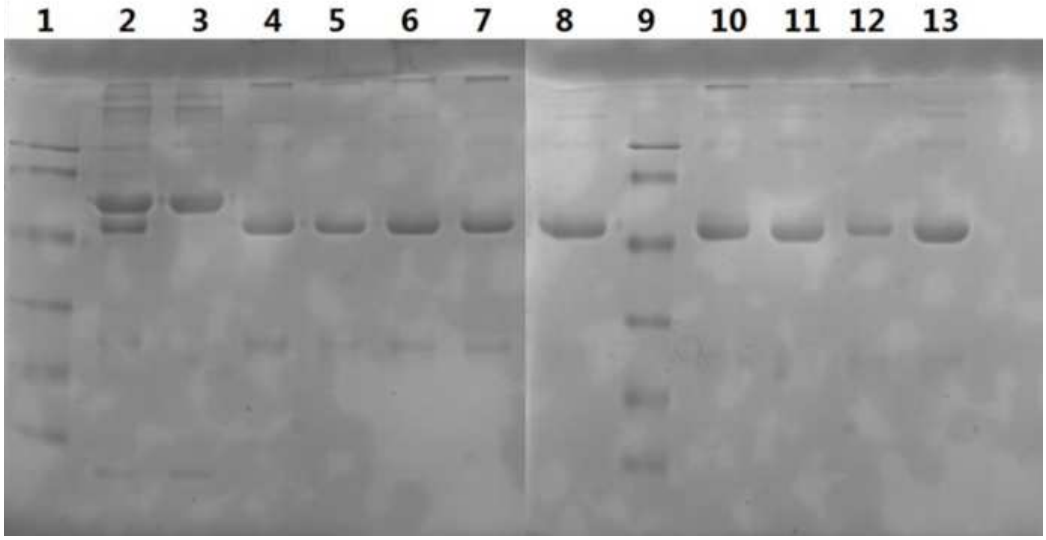
Do CIP after purification process, measure DBC each 18 injection cycles.

Step	solution	CV
Equilibration	20 mM PB，0.15M NaCl，pH7.4	5CV
Loading	1mg/ml hIgG+ BSA/Lysozyme	RT=0.6min，50%DBC
Washing	20 mM PB，0.15M NaCl，pH7.4	5CV
Elution	0.1M Gly-HCl，pH3.0	5CV
CIP	0.1M NaOH	4CV, 15min









Lane

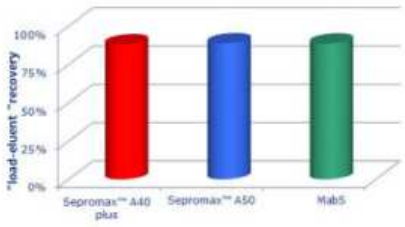
1：Marker
2：Sample
3：Flow through
4：Run 4
5：Run 21
6：Run 39
7： Run 57
8： Run 75
9：Marker
10： Run 95
11： Run 111

Load-Eluent Recovery

With the rProtein A ligand fully functional, Sepromax® A50 delivers high recovery of purified antibodies.

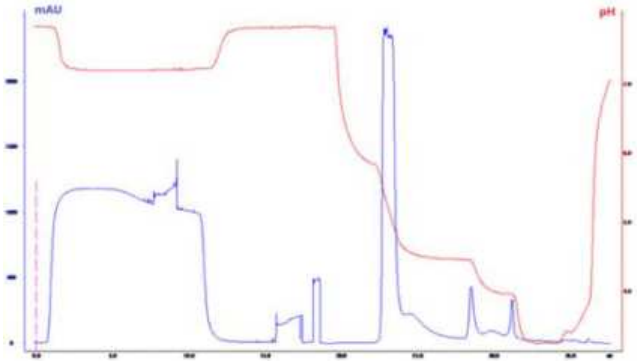
Sample: 1.0mg/ml γ-globulin

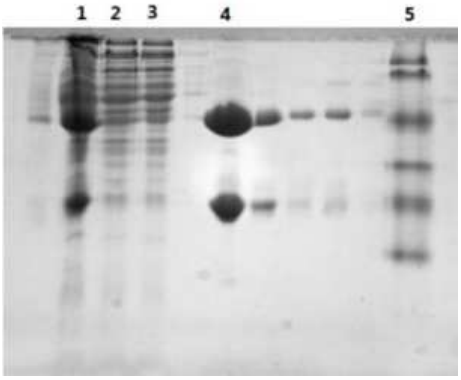
	Load (μg)	Eluent (μg)	Recovery (%)
Sepromax® A50	37.65	33.16	88.07
Sepromax® A40 Plus	36.01	31.97	88.61
Competitor	33.96	30.09	88.81



mAb Purification Test

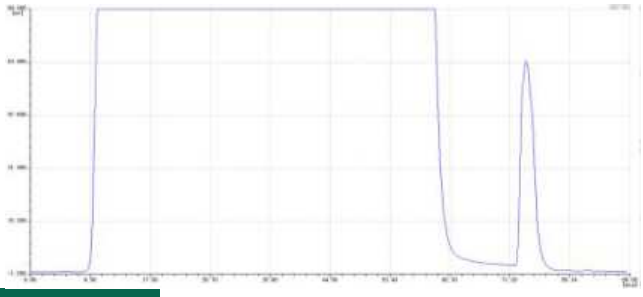
Sample: monoclonal antibody from murine





Lane
1 Ascites treatment fluid (reduction) 2 break through (reduction)
3 break through (reduction) 4 eluent (reduction) 5 marker

Fc protein Purification Test



Media	Sepromax A 50 affinity media
Column	1.0 × 2.5cm，column volume 2mL
Sample	Fc protein Xsupernatant(2.0g/L)
Loading buffer	10mM PB+0.2M NaCl, pH 7.5
Elution buffer	20mM Sodium Citrate+0.2M NaCl, pH3.7
Flow rate	115 cm/h

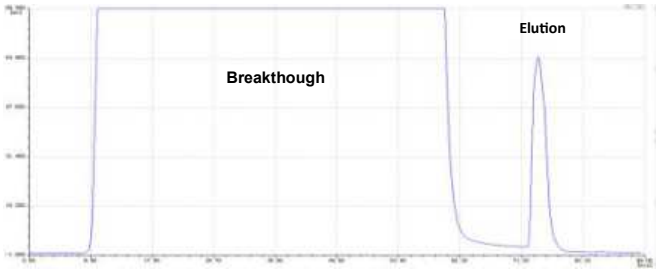
Impurity Removal Test (HCP&DNA)

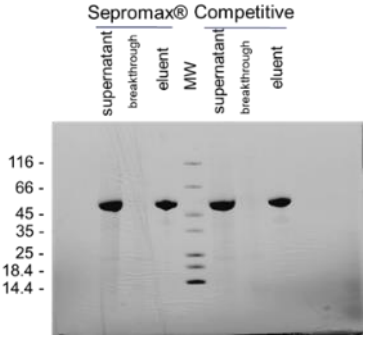
In the production of mAb's for pharmaceutical applications, residue of host protein (HCP) and DNA are an important indicators of quality. Protein A affinity chromatography is an efficient method to remove these residual impurities.

Media	1.0 × 2.5cm，column volume 2mL Sepromax A50
Sample	Fc protein Xsupernatant(2.0g/L)
Loading buffer	10mM PB+0.2M NaCl, pH 7.5
Elution buffer	20mM Sodium Citrate+0.2M NaCl, pH3.7
Flow rate	115 cm/h

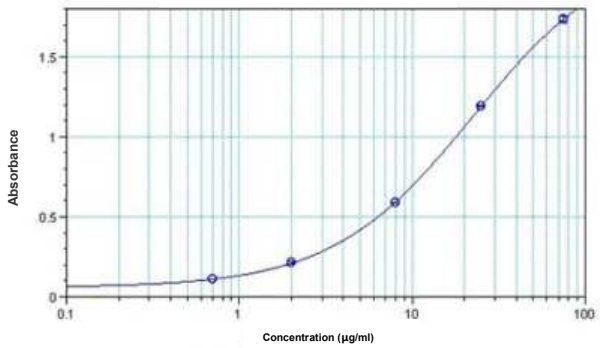
Result:

HCP (ng/mg)	Sepromax® A50	Competitor
supernatant	1754.3	1716.5
rPA Eluate	1.9	4.5
Reduction	9.2×10^2	3.8×10^2





Standard Curve of HCP



Standard HCP μg

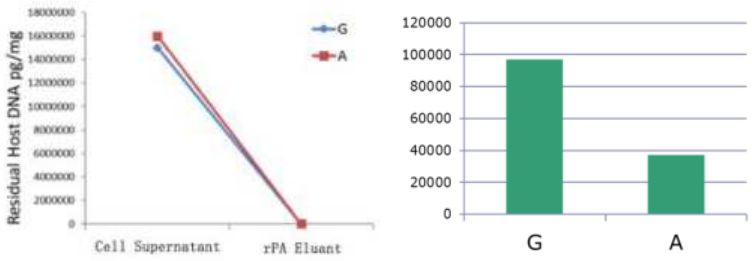
Sample	Concentration	Wells	Values	MeanValue	Std.Dev.	CV%
HC01	0.000	A4	0.052	0.056	0.004	8.0
		A5	0.059			
HC02	0.700	B4	0.112	0.112	0.000	0.3
		B5	0.113			
HC03	2.000	C4	0.206	0.212	0.008	4.0
		C5	0.218			
HC04	8.000	D4	0.588	0.589	0.001	0.3
		D5	0.590			
HC05	25.000	E4	1.190	1.192	0.003	0.2
		E5	1.194			
HC06	75.000	F4	1.751	1.734	0.023	1.3
		F5	1.718			

Smallest standard value: 0.056
Largest standard value: 1.734

DNA Removal Test

DNA test kit: AB (4413713)

QPCR - using magnetic beads extracted DNA from sample. Prepare PCR reaction mixture with DNA extraction solution and standard solution. Using Bio-rad real-time PCR for reaction and fluorescence assay.



rDNA (pg/mg)	Sepromax ® A40 plus G	Competitor A
Cell supernatant	1.5×10^7	1.6×10^7
rProtein A eluate	154.4	431.3
Reduction	9.7×10^4	3.7×10^4

Regulatory Support Files, RSF

All regulatory support documents based on FDA reporting requirements that can assist customers in process development, validation and preparation of SOPs.

GLK-gel Agarose Media

GLK-gel Agarose media offer high specificity and selectivity for biomolecular separations and purifications. Affinity separation can often remove contaminants difficult to eliminate using other chromatographic procedures. Purifications up to several orders of magnitude can be achieved in a single step.

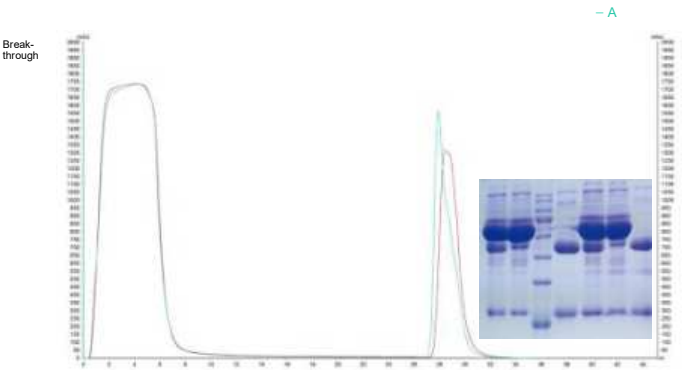
Advantages

- Stable bonding
- Low ligand leaching
- NaOH CIP

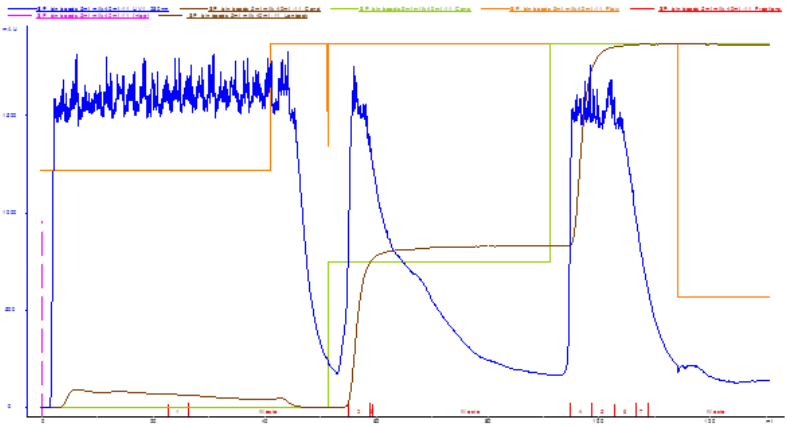
	Pr A 4FF	Pr G 4FF	Pr SupA
Substrate	Cross-linked agarose		
Ligand	rProtein A	rProtein G	Super alkaline resistant Protein A
Particle Size	90μm (45-165μm)		~60 μm
Capacity (DBC)	20mg hIgG/ml	25mg hIgG/ml	> 80 mg hIgG/ml
pH Stability	2-10 (Short) 3-9 (Long)		3-10
Max. Pressure	0.3MPa		
Flow Rate	300cm/h	300cm/h	100-500 cm/h
Storage	4-8 °C, 20% EtOH		1XPBS with 20% ethanol, 2-8°C

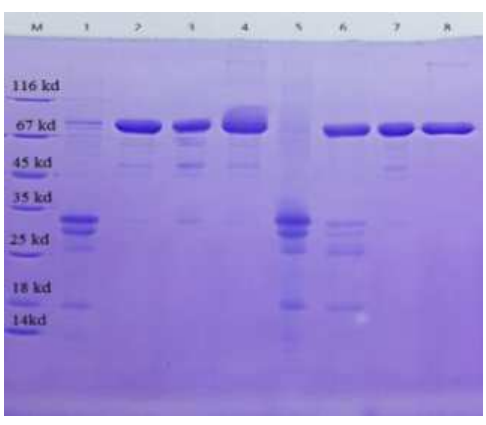
Purification of IgG in human serum

Sample: 5ml human serum with five times dilution (different buffers)
Column: HT01 1.0ml Protein G 4FF
Balance: A 0.02 M PB pH7.0;
B 0.02M PB, 0. 3M NaCl pH 7.0
Elution: 0.1 M Glycine-HCl pH2.7
Flow Rate: 0.25m/min (sampling), 1ml/min



Protein Purification





GLK-gel Ni Affinity Media

GLK-gel Ni affinity media are a nickel metal chelating chromatography media with IDA/NTA/TED ion high cross-linked agarose. GLK gel Ni Affinity Media have advantages of excellent stability, biocompatibility, solvent compatibility, large capacity, good selectivity, high resolution natural generation and low cost.

GLK-gel Ni IDA

Substrate	6% high cross-linked agarose
Particle Size	90μm (45-165μm)
Binding Capacity	Approx. 45 mg His (tag protein)/ml media
pH Stability	3-12 (Working); 2-14 (Cleaning)
Max. Pressure	0.3MPa
Chemical Stability	Common aqueous solutions and buffers. Avoid chelating agents (EDTA, EGTA) and reducing agents (DTT, DTE)
Storage	4-15 °C, 20℃ EtOH

Application Case

Column: 1ml

Sample: E. coli cracking supernatant (His tag protein)

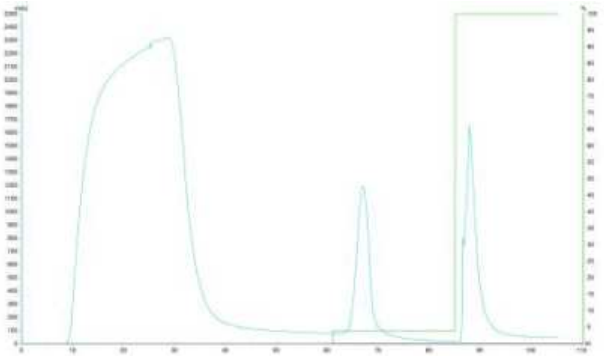
Equilibrium liquid: 0.02MPB、0.5M NaCl，pH 7.4

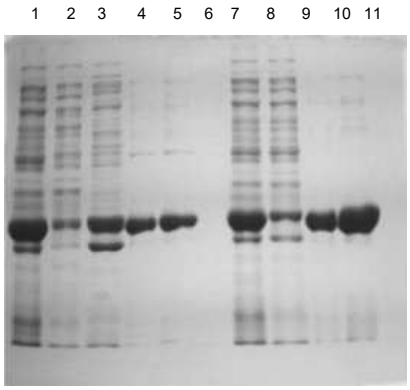
Elution: 0.02MPB, 0. 5M NaCl, Imidazole, pH 7.4

Flow Rate: 1ml/min

Sample:
1. Original;
2. Breakthough;
3. Elution(4%B);
4. Elution(100%B);
5. Elution(100%B);
7. Original;
8. Breakthough;
9. Elution(4%B);
10. Elution(100%B)

No imidazole in 1-5. 0.02M imidazole in 7-10.





GLK-gel Ni TED

Tolerance of higher reducing agents and chelating agents, eukaryotic secreted expression of His tag protein can loading without prior treatment, maximum protect the activity of protein.

Direct use NaOH for cleaning without nickel removal, reduce cleaning time.

Lower nickel shedding, no need for repeated regeneration.

Substrate	6% high cross-linked agarose
Particle Size	90μm (45-165μm)
Binding Capacity	Approx. 20 mg His (tag protein)/ml media
pH Stability	3-12 (Working); 2-14 (Cleaning)
Max. Pressure	0.3MPa
Chemical Stability	0.01M hydrochloric acid; 0.01M sodium hydroxide (one week); 20mM EDTA; 10mM DTT; 1M sodium hydroxide; 8M urea; 100mM EDTA; 0.5m imidazole (2 hours); 6M guanidine hydrochloride (24 hours); 30% isopropanol (20 min)
Storage	4-15 °C, 20℃ EtOH

Sepromax® IEX Media

Alkali-resistance Type

Sepromax® ion-exchange media are based on large pore polystyrene/divinylbenzene (PS-DVB) particles. It has excellent mechanical property and can withstand pressures up to 10 MPA. Their 1000Å pore size allows low mass transform of biomacromolecules. These particles have been modified with GALAK unique coating technology and become completely hydrophilic.

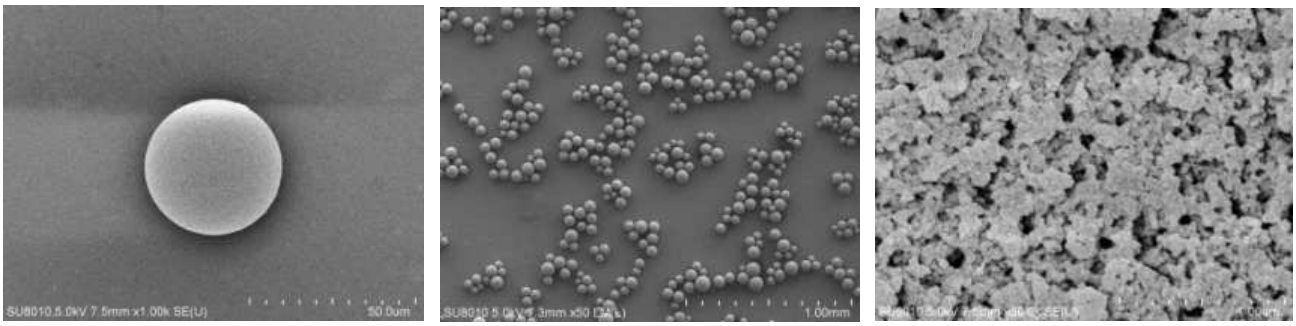
Advantages:

- Rigid particles, low backpressure, suitable for large-scale purification processes.
- High flow rate, high loading capacity, high purification efficiency.
- Excellent chemical stability, alkali stable under CIP and long lifetime.

Sepromax® Polymer Particles

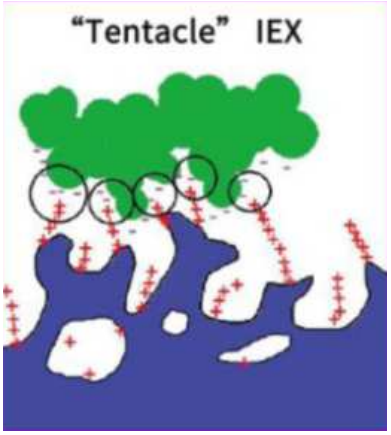
Sepromax® is a family of spherical divinylbenzene-styrenecopolymer (PS-DVB) particles designed for large-scale purification processes. With unique technologies, we precisely control their particle size, pore structure, pore size and surface area. Sepromax® particles have excellent mechanical properties and can withstand up to 10 MPa pressure. Their large pore sizes allow low mass transform of biomacromolecules.

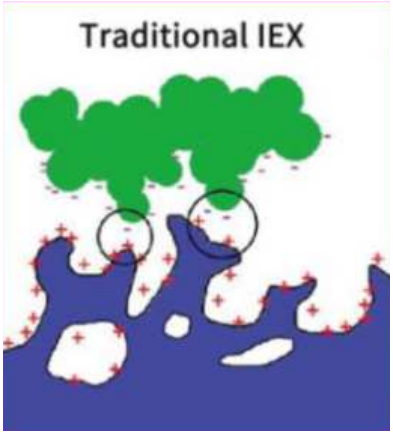
Optional: average particle size: 20/50/70/150 μm, pore size: 1000/2000/3000/5000A



Sepromax® "Tentacle"

Sepromax® IEX media carry "tentacle" surface structures. Functional groups are covalently bonded on the surface in the form of linear polymer chains. This structure enables macromolecules such as antibodies, viruses and plasmids to interact more effectively to the functional groups of the media, increasing the binding capacity significantly. "Tentacle" structure also effectively reduces the non-specific interaction between biomolecules and media, thus improving the recovery of target molecules.





Parameter

	Sepromax® S50	Sepromax® CM50	Sepromax® Q50	Sepromax® D50
Substrate	Rigid, PS-DVB microspheres			
Particle Size	50um (35-75μm)			
Ligand	$-SO^{3-}$	-COO-	$-N^{+}(CH_3)_3$	$-N^{+}H(CH_3)_2$
pH Range	2-12	6-12	2-12	2-9
Dynamic Capacity	60mg Lysozyme/ml	80mg Lysozyme/ml	100mg BSA/ml	100mg BSA/ml
Max Pressure	1500 psi (100 bar or 10 MPa)			
pH Stability	1-14			
Storage	20% EtOH,4-30℃			

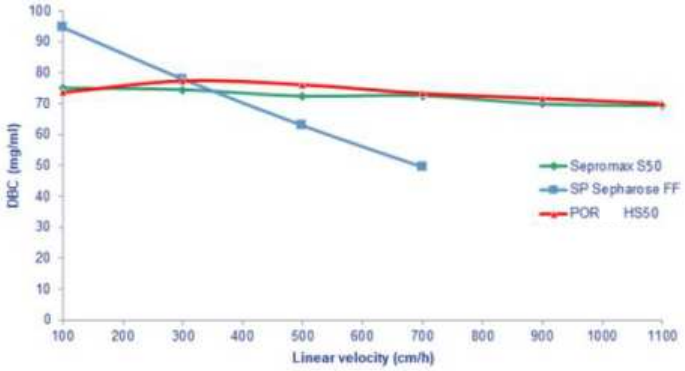
* DBC (Dynamic Binding Capacity): frontal analysis @ 10%, 300cm/h, 5cm column height

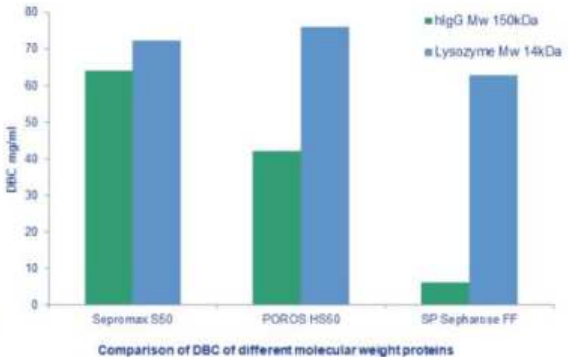
Customization Product

	Particle Size	Ligand	Dynamic Capacity	Application
Sepromax® SS50	50um (35-75μm)	$-SO^{3-}$	80 mg Lysozyme/ml	Small molecular protein, <100,000kDa
Sepromax® S50			60mg Lysozyme/ml	Big molecular protein, >100,000kDa

High Loading Capacity

Sepromax® S50 has excellent binding capacity under high linear velocity. This leads smaller column size and faster cycle time.

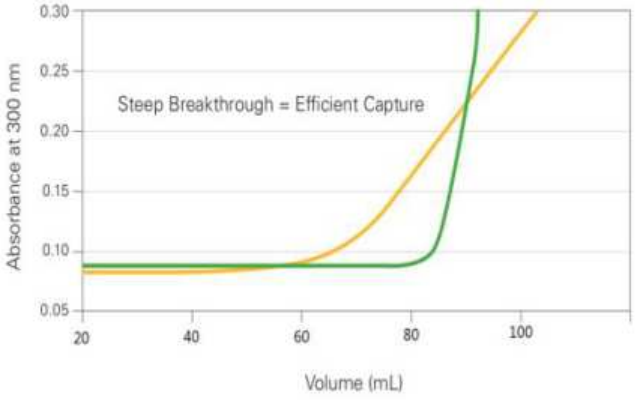




Break-though Curve

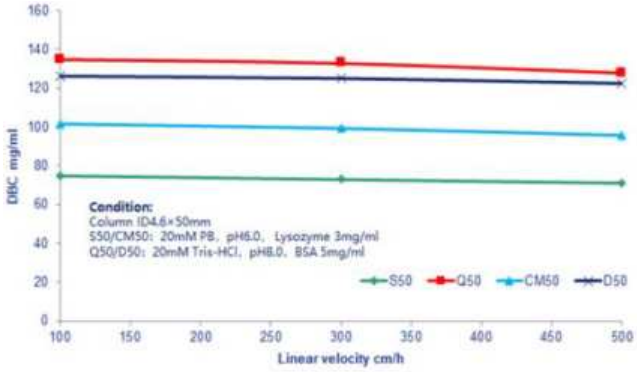
The capture efficiency of Sepromax® S50 was measured by the fronted break-though curves at 5% and 10%.

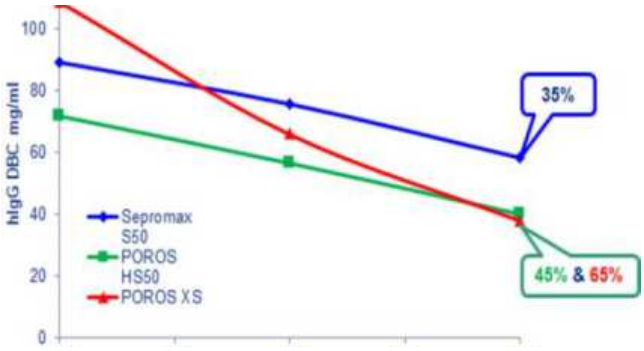
The break-though point of protein penetration curve of polysaccharide type media is relatively earlier.



Excellent Stability

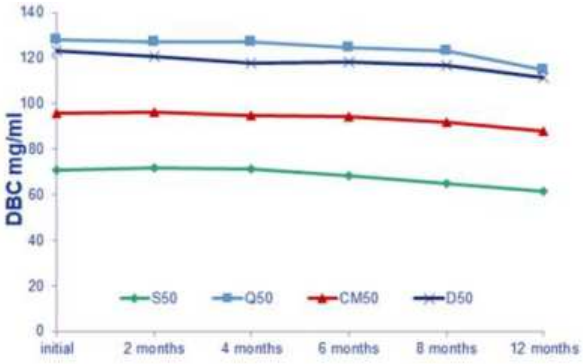
The dynamic binding capacity (DBC) of Sepromax® IEX will not decrease significantly with high linear flow rate. When flow rate increased from 100cm/h to 500cm/h, Sepromax® S50 can maintain 65% of its DBC at 100cm/h.

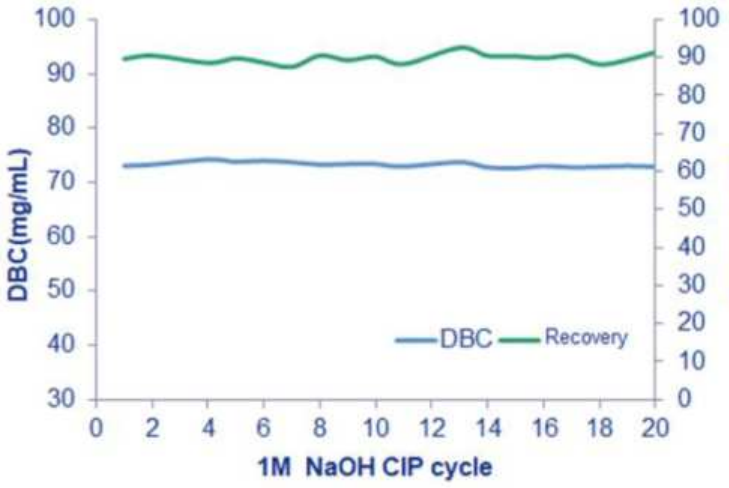


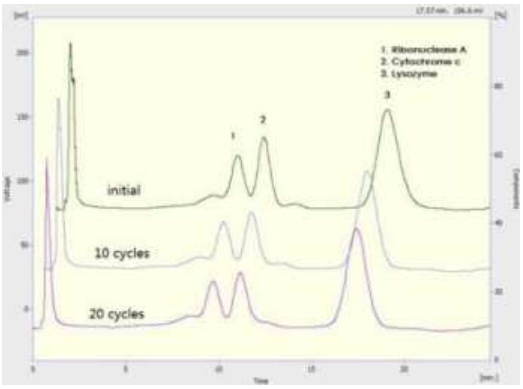


Stability under CIP Condition

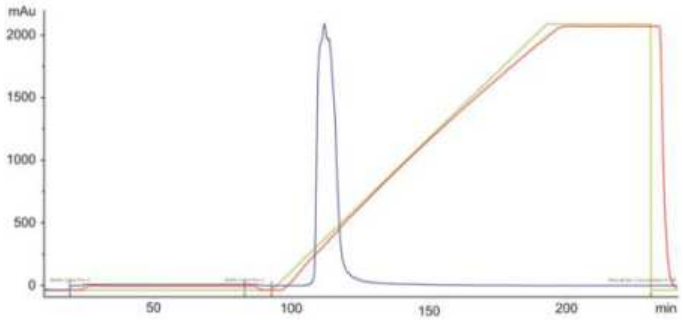
Clean-in-place (CIP) is a very important process in protein purification in biopharmaceutical industry. Sepromax® IEX media shows excellent chemical stability under harsh CIP conditions. In the experiment, 1M NaOH solution was selected to soak the four ion exchange media, and the loading was evaluated at regular intervals. After soaking for one year, the loading capacity of the four media did not decrease significantly.

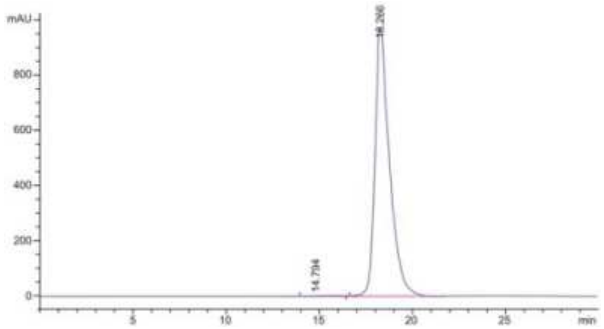






Monoclonal Antibody Purification





Purify of finished product: 99.5%

Column: 2.5cm Height, 5ml CV

Medium: Sepromax® S50

Sample: Mab, Protein A elution pool 150 ml

Buffer A: 20 mM NaAc-HAC, pH 6.0

Buffer B: 20 mM NaAc-HAC, pH 6.0+ 1 M NaCl

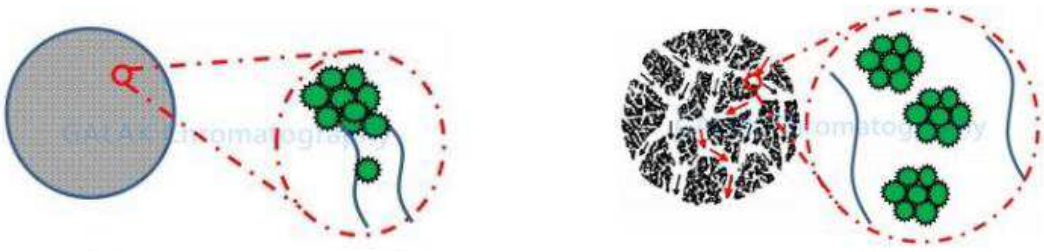
Flow rate: 2 ml/min

Gradient: 0%-100% B (20 CV)

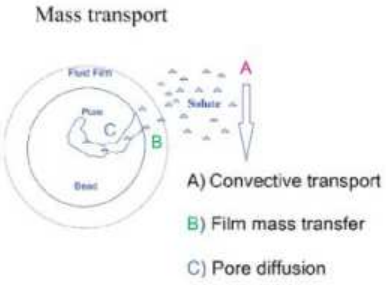
System: AKTA explorer100

VirCap® Perfusion Media

Perfusion chromatography media are porous polymer microspheres made by polymerizing styrene and divinylbenzene. The particles contain two types of pores: large through-pores, also known as convective pores or perfusion pores, with diameters between 600-800nm that run throughout the entire particle, and smaller interconnecting pores, or diffusion pores, with diameters between 50-150nm and depths usually less than 1um, that link the large pores. The media have a porosity of approximately 50 -60%, can withstand pressures up to 5MPa, and can be used at higher flow rates than traditional media such as agarose or dextran (with pressure tolerance lower than 0.5 MPa), resulting in greatly improved production efficiency.



Perfusion chromatography media is a rigid polymer microsphere coated with a unique hydrophilic polymer, covalently linked to various functional groups (ion exchange, affinity, hydrophobic, etc.), with a highly stable structure that is very suitable for the purification of biopharmaceuticals. The large particle size provides a good balance between resolution and operational back pressure. The dynamic load and resolution are less affected by the increase in linear velocity, making the separation step faster than traditional gel chromatography media.



Characteristic

- **Large Pore Size**

1000-3000Å pore size, enable the diffusion and mass transfer for large biomolecules.

- **Particle Size**

35-85 micron particles, satisfy your purification processing requests.

- **Rigid Microspheres**

Maximum pressure is over 870psi(60 bar), excellent mechanical property.

- **Flexible Tentacles**

Higher recovery rate and target purity, with excellent combination and capture capability .

- **Harsh Clean-in-Place Condition (CIP)**

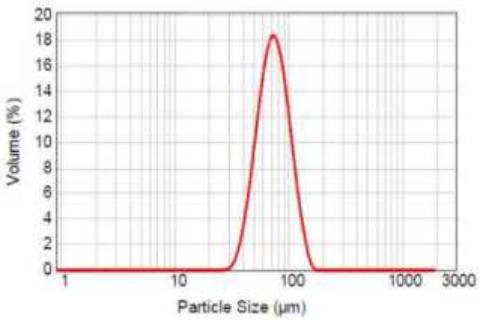
0.5-1M NaOH, organic solvent, high salt solvent.

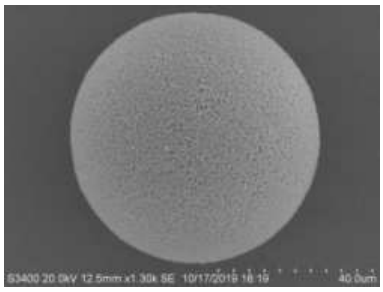
- **Robust Chemical Stability**

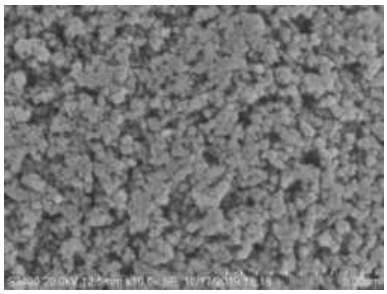
VirCap® particles are rigid polymeric particles that are coated with a proprietary hydrophilic polymer onto which the various functional groups (ion exchange, affinity, etc.) are covalently attached.

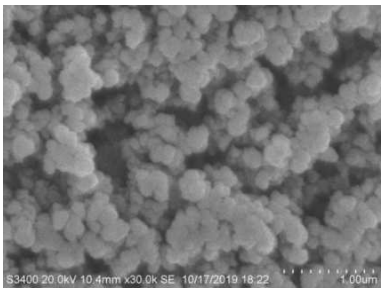
Rigid Microsphere With Large Pore Size

VirCap® particles large “through-pores”. These large through-pores allow part of mobile phase to flow through, quickly carrying biomolecules to smaller diffusive pores. The large through-pores reduce diffusion rate of biomolecules and enhance interaction between biomolecules and functional groups on the surface. Consequently, mass transfer barriers are lowered, and flow rate can be increased without compromising capacity or resolution.

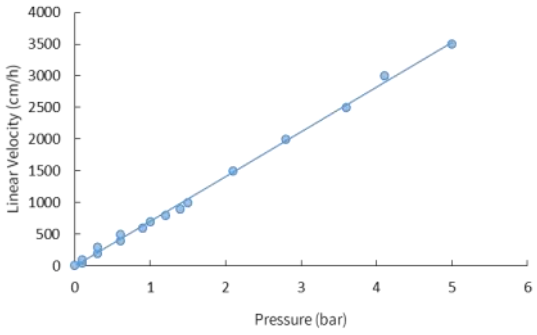


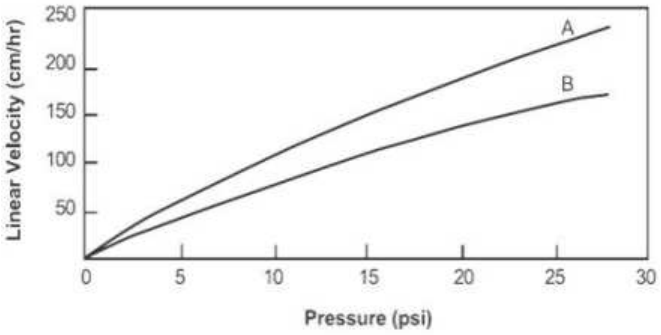






High Pressure Resistance

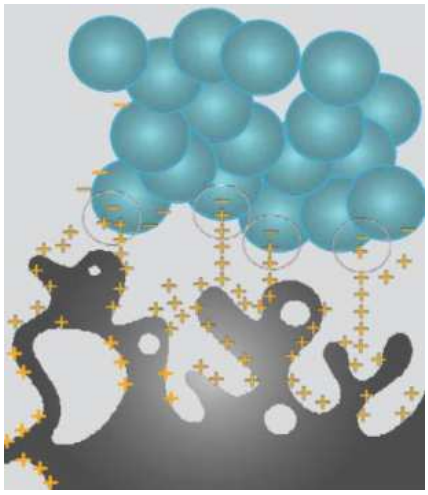




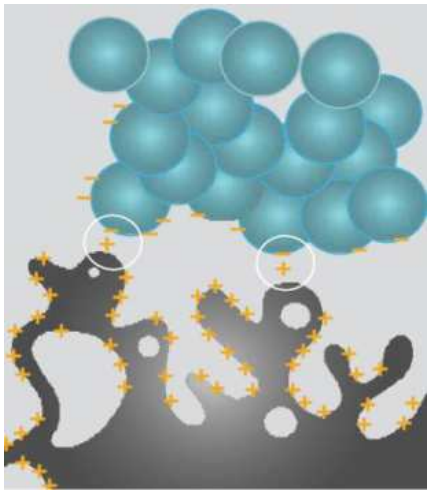
Flexible Tentacles

Flexible tentacle structures minimize steric hindrance between functional groups and target molecules. It also improves the binding capability of the target material. Compared to traditional media, VirCap® media show more effective capture and higher recovery.

Tentacle ion chromatography media

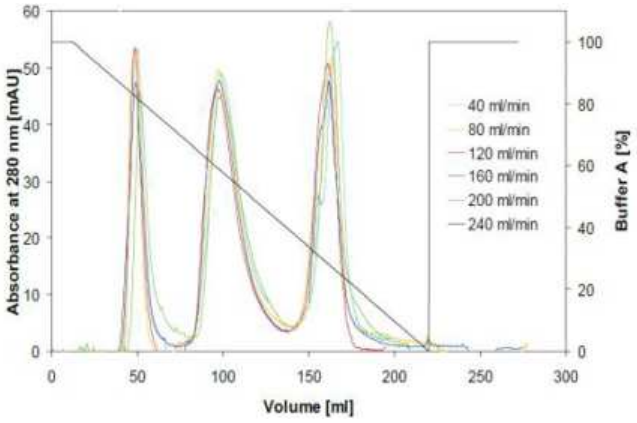


Traditional ion chromatography media

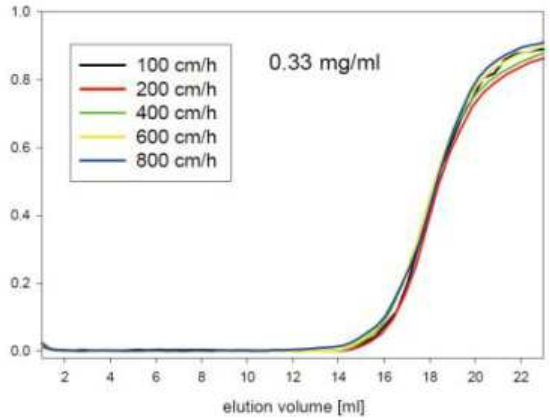


High Flow Rate, Low Backpressure

VirCap® media offer an excellent balance of resolution and operating backpressure.
Under recommended condition of mobile phase, VirCap® media exhibit almost no shrinking or swelling. The combination of through-pores and flexible tentacles ensure rapid diffusion of solute. It also reduces the barrier of mass transfer, and realizes high dynamic binding capacity (DBC) under the high flow rate.



Peak width at different flow rates (VirCap® media 3000Å)

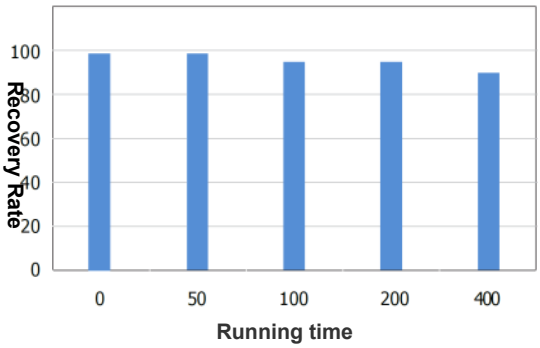


Dynamic capability at different flow rates (VirCap® media 3000Å)

Robust Chemical Stability

VirCap® media are highly cross-linked polymeric particles coated with a proprietary hydrophilic layer on which various functional groups (ion exchange, affinity, etc.) are covalently attached. The result is chemically stable product that is ideally suitable for large-scale biopharmaceutical separation.

Lot	RT (min)	Area	Height	TP	As
1	2.652	537586	190057	29507	1.10
2	2.641	536434	187236	26529	1.21
3	2.602	533688	186841	27349	1.12
4	2.599	531408	188244	29147	1.05
5	2.622	534911	187224	26901	0.98
6	2.647	540382	188746	26862	1.19
7	2.626	531906	188743	27855	1.08
8	2.628	540015	189618	28034	1.11
9	2.610	541372	188711	26567	1.16
10	2.623	527072	185477	26420	1.20



VirCap® AF / Q Media

Virus purification often used in producing virus type vaccines, and also provides an important tool for the study of virus fine morphological structure. Isolation and purification of virus antigen protein are detailed studies of virus chemical composition and genetic material.

VirCap® AF is an affinity chromatography media designed for the capture and moderate purification stages of capsular virus purification. Specific adsorption of VirCap® AF media and target occurs by simulating the affinity between ligands and virus particles with capsular membranes. With unique high loading capacity, high flow rate and low back pressure, VirCap® AF reduces the process cycle time and increases the yield, fully meeting the requirements of large-scale vaccine production processes. VirCap® Q on the other hand is a strong anionic exchange packing material that is capable of capturing virus type vaccine.

	VirCap® AF	VirCap® Q
Substrate	Hydrophilic PS-DVB (Polystyrene/divinylbenzene) Microspheres	
Particle Size	50um, 70um	
Function Group	Sulfate Ester	$-CH_2-CH_2-CH_2-N+(CH_3)_3$
Dynamic Binding Capability	lysozyme 30mg/ml	BSA >90 mg/ml
Flow Rate	1000cm/h (20℃, buffer solution viscosity same as water, pressure < 3 bar / 43.5psi, column bed height 20cm)	
Column Bed Height	20-40cm	
pH Stability	1-14	
Working Temperature	4-30℃	
CIP Condition	0.5-1M NaOH	
Storage	2-8℃ 20% EtOH	

VirCap® AF media Application

Viruses		Viral/Microbial Antigens
Rabies	Feline Calicivirus	Herpes Simplex gA and gB Glycoprotein Subunits
Influenza	Respiratory Syncytial Virus	Hepatitis B Surface Antigen
Japanese Enchephalitis	Human Herpes Simplex	Filamentous Hemagglutinin from B. pertussis
Feline Leukemia	Human Measles	Leucocytosis Promoting Factor Hemagglutinin
Feline Herpes	Human Parainfluenza	

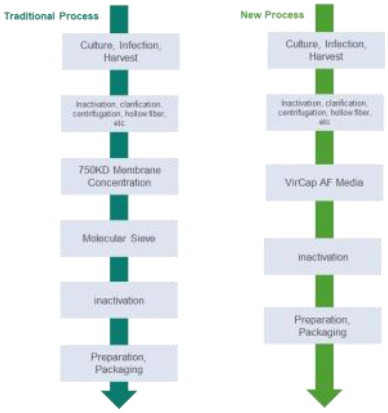
One-step Porcine Pseudorabies Virus Purification

Porcine pseudorabies virus (PRV) causes fever, itchiness (except in pigs) and encephalomyelitis as the main symptoms in a variety of domestic and wild animals. Immunization is the main strategy for the prevention of pseudorabies, and a weakened vaccine with the Bartha-K61 strain is currently used in China.

The use of such inactivated virus vaccines is considered an effective way to prevent pseudorabies in pig farms, improving reproduction rate of sows and control piglet mortality.

The loading volume of VirCap® AF70 affinity chromatography is large (up to 5-10 column volumes). And it does not require concentration, which also avoids the loss of antigen from concentration and improves production efficiency. Therefore it is suitable to process scale-up.

The results of serum antibody detection showed that the antibody level after vaccination of purified vaccine - high dose group and medium dose group was close to that of commercial vaccine group, and the immunization effect was satisfactory.

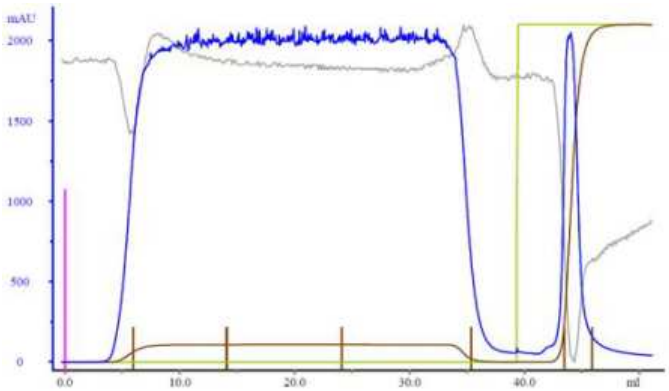


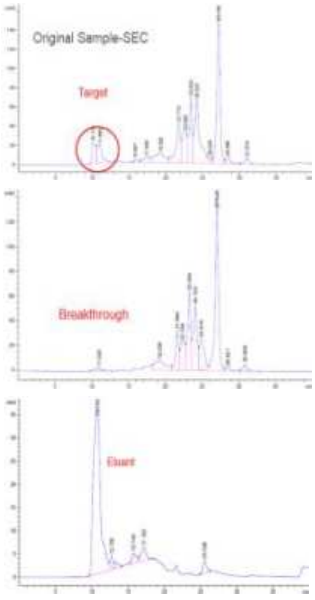
Advantages

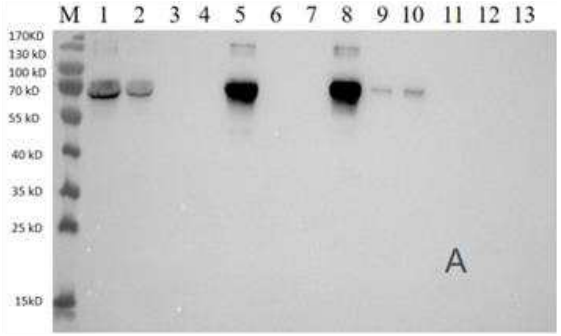
1. Samples are pre-treated and directly sampled after VirCap one-step chromatography target yield greater than 70%; very low back pressure at higher flow rates.

2. Samples are loaded under neutral conditions with the vast majority of proteins, nucleases, HCP, endotoxins, DNA flow-through in the sample, and data provided by users indicate that the removal of miscellaneous proteins, HCP, nucleases, DNA, etc. is greater than 90%.

3. Mild adsorption and elution conditions, reducing downstream purification steps, sample pre-treatment only requires simple solid-liquid separation to remove most of the large solid particles.

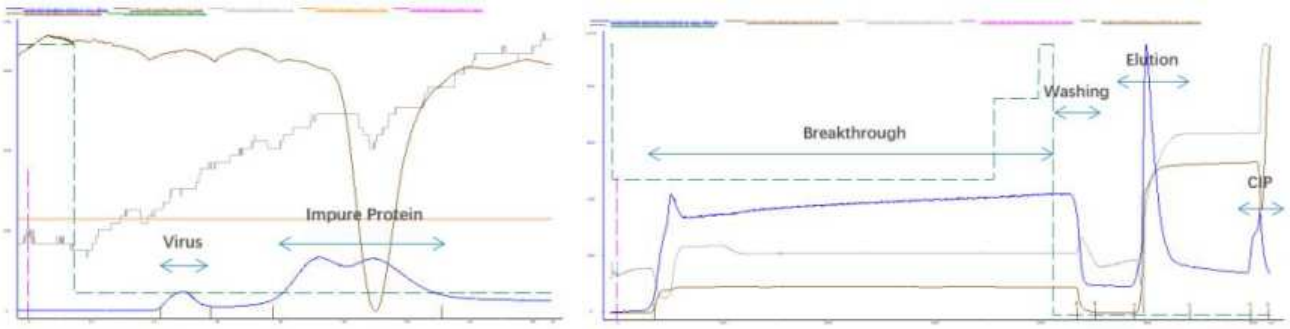




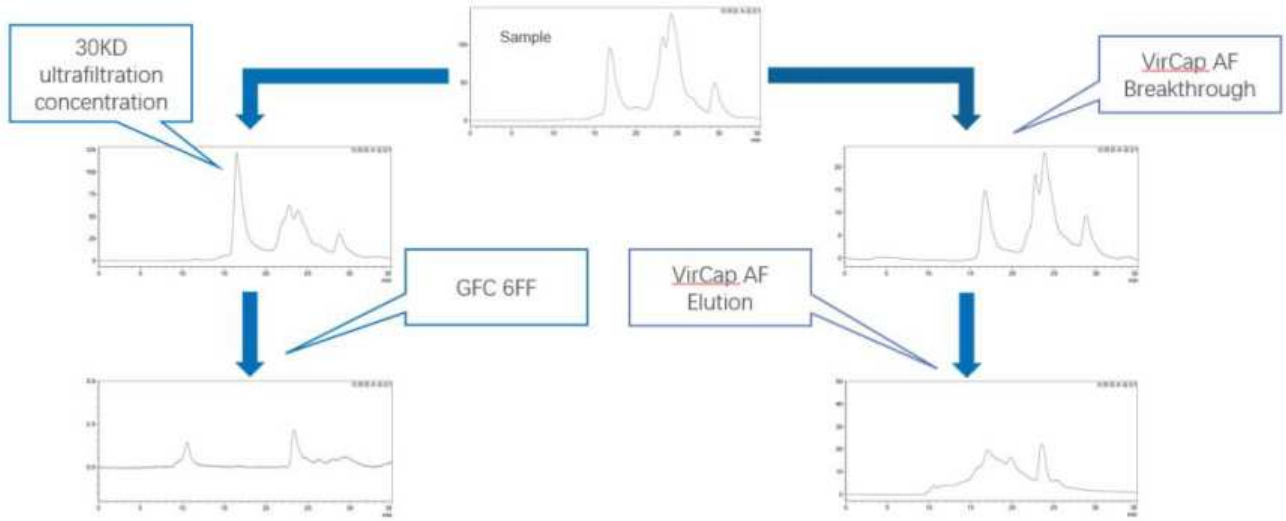


1. Unprocessed original sample
2. Original sample centrifuged at 3000rpm
3. FT6
4. W6
5. ET6-1
6. FT7
7. W7
8. FT7-1
9. ET6-1 diluted 7 times
10. ET7-1 diluted 7 times
11. ET6-2 diluted 7 times
12. ET7-2 diluted 7 times
13. CIP6

Gel Filtration Chromatography vs. Perfusion Chromatography

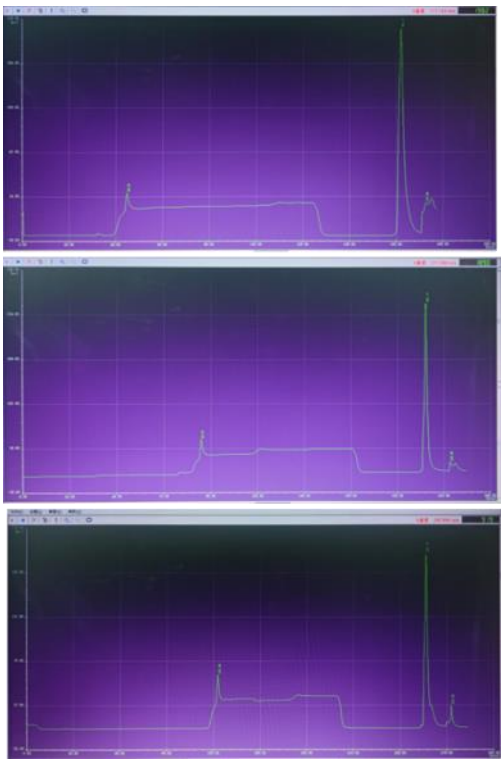


SEC-HPLC Analysis



Pilot Test

Column: VirCap AF 14.13L-CV, ID300mm L20cm.
Dilution buffer: 20 mM MES pH 4-4.5
Loading buffer: 20 mM MES pH 6.0-6.4
Post-sample Equilibration Buffer: 20 mM MES pH 6.0-6.4
Elution buffer: 50 mM Tris +0.5 M NaCl (pH~10)
Washing buffer: 1M NaOH
Purification Flow Rate: 140 L/h (200cm/hr)
Detection: 280nm & 260nm



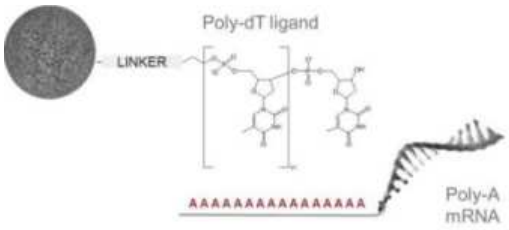
Sample Pretreatment: clarified liquid after centrifugation is filtered by 0.45um membrane, and 1X volume of dilution buffer is added to control sample conductance and pH (conductance range 7-10 mS/cm, pH range 5.9-6.3).

Sample volume: The recommended sample volume is 120-140 L (i.e. 8-10 CV).

Elution: After the sample loading is completed, first equilibrate the buffer to UV280 baseline and start elution with elution buffer to collect the elution peaks, and it is recommended that the collection termination point drops to 10% of the highest peak of the elution peak.

Washing & Regeneration: After elution is completed, wash 1-2CV with washing buffer, rest time 30-60min, equilibrate to neutral with pure water, and finally top sample/equilibration buffer 2-5CV, to be used.

VirCap® Oligo dT(25) Affinity Resin



VirCap® Oligo dT(25) Affinity Resin is based on rigid, 50µm polymeric resin designed to isolate messenger RNA (mRNA). The resin backbone consists of crosslinked PS-DVB (polystyrene divinylbenzene).

The polyhydroxy surface coating provides low non-specific binding. The surface is functionalized with a linker and poly dT(25) functional group allowing capture of mRNA through H-bonding pairing with the mRNA polyA tail.

VirCap® Oligo dT(25) Affinity Resin provides efficient capture and easy release under standard mRNA purification conditions. It thereby decreases process development time and enhances productivity. In addition, the selective nature of this resin allows a reduction in plasmid DNA and other transcription mix components. The resin is also stable at elevated temperatures for the breakdown of undesired higher-order structures if required.

Features

- Easy mRNA purification to separate non-poly A tail contaminants
- Simplified workflow helps to maximize efficiency, thereby reducing complexity of subsequent polish steps
- Excellent scalability
- Non-animal derived

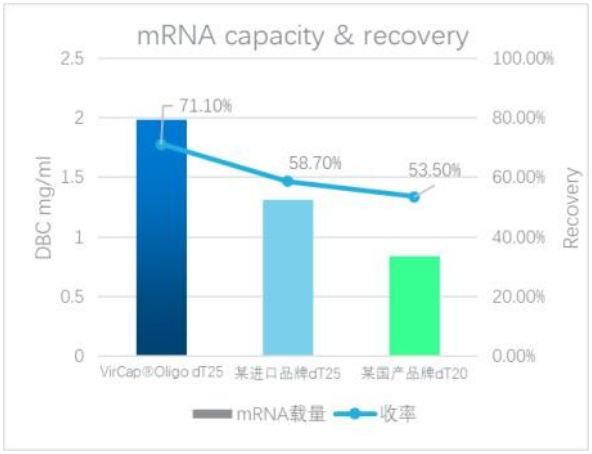
VirCap® Oligo ligands are manufactured using a synthetic manufacturing process that are free of animal components.

Specification

Characteristic	Description
Support matrix	cross-linked poly(styrene-divinylbenzene)
Average particle size	50 um
Average pore size	200 nm
Surface functionality	poly(dT) 25mer with proprietary linker
Ligand density	0.3 umol/ml
Mechanical resistance	70 bar (1,000 psi; 7 MPa)
Thermal stability	allows sample denaturing at 65°C if needed
pH range	2-13
Ionic strength range	0 to 5 M, all common salts
Chemical resistance	Common agents for mRNA purification, including 0.5 M NaOH, 2 M MgCl2, 20 mM EDTA. Water, 0 to 100% alcohol, acetonitrile, 2 M aceticacid, 1 M HCl, other common organic solvents
Shipping solvent	18-20% ethanol

Capacity & Recovery

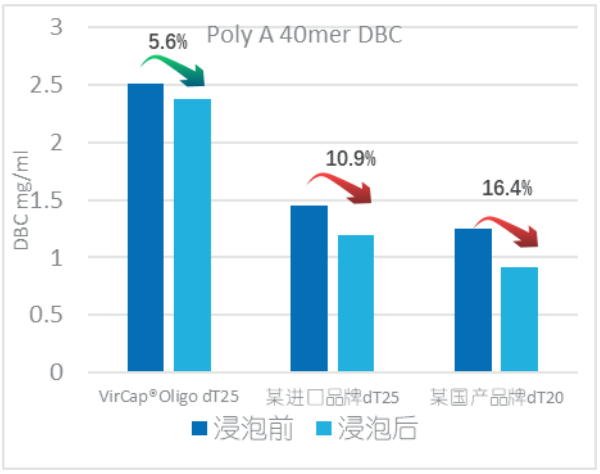
Column size	1ml column
System	AKTA purifier10
Binding buffer	10 mM Tris-HCl, 0.5 M NaCl, 1 mM EDTA, pH 7.4
Wash buffer	10 mM Tris-HCl, 300 mM NaCl, 1 mM EDTA, pH 7.4
Elution buffer	10 mM Tris-HCl, 1 mM EDTA, pH 7.4
Regeneration	Water
CIP	0.1M NaOH
Sample	mRNA
Flow rate	1ml/min

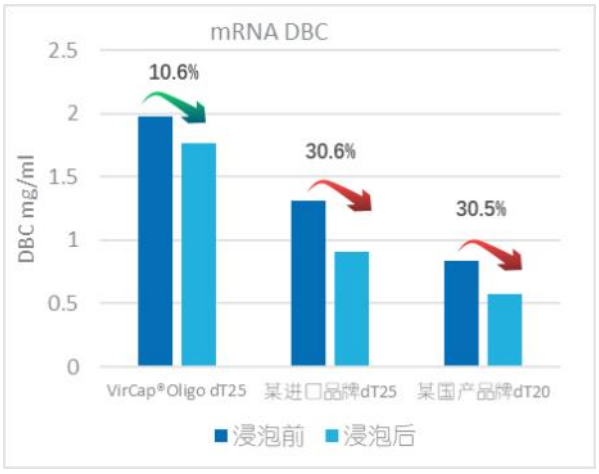


Alkali Resistance Test

Method: After soaking the resin in 0.5 M sodium hydroxide for 48 hours, measure the change in binding capacity for poly A 40mer and mRNA.

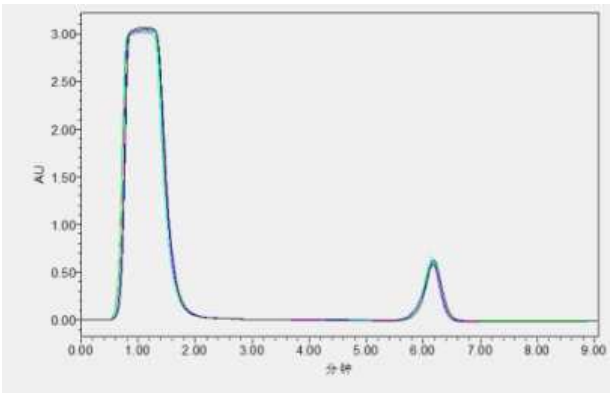
Results: (VirCap ® Oligo dT25 and 2 commercial Oligo dT resin)

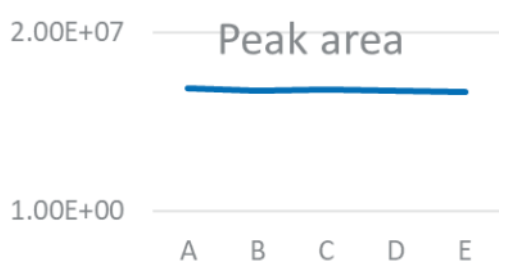




Batch Stability

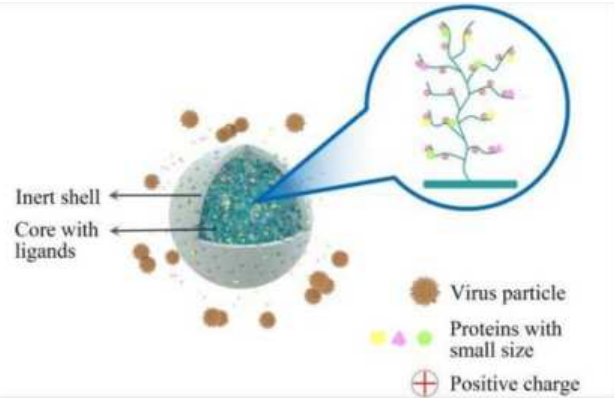
Method：Five different batches of VirCap® Oligo dT(25) affinity resin were packed into columns and subjected to mRNA sample injection and elution program on HPLC. Chromatograms and peak areas of elution were compared.





VirCap® InertShell Core-Shell Resin

VirCap® InertShell is designed with the core-shell technology. It is for purification of viruses and other large biomolecules. The core-shell technology allows for combining size exclusion separation with IEX chromatography. Viruses and other large biomolecules that are too large to penetrate the inert shell of the chromatography resins are collected in flow through fraction (FT mode). Contaminants (< Mr 700 000) on the other hand pass through the inert outer shell and bind to the ligands in the inner core.



VirCap® InertShell is made of polymethacrylate microspheres with octylamine ligand inside the pore as shown in Pic 1. The shell of the microspheres is neutral and hydrophilic, which has no biomolecule adsorption. The pore size of the shell (50-100 nm) is smaller than that of the core (200-500 nm). And the thickness of the shell is about 0.5-1.0μm. The shell prevents proteins (molecular weights greater than 700 kDa) from entering the core. In the chromatography process, large-size viruses or other large biomolecules cannot enter the microsphere core and they will breakthrough and be collected. The octylamine ligand in the core carries its dual functions of anion exchange and hydrophobicity, capturing protein molecules with molecular weight less than 700 kDa. VirCap® InertShell can effectively remove host cell proteins (HCP's), DNA fragment, endotoxin, albumin and other impurities.

Specification

	VirCap® Inert Shell	Capto Core 700
Matrix	Polyacrylate	Highly cross-linked agarose
Ligand	Octylamine	Octylamine
Average particle size	50-150 μm	50-150 μm
Density of ligand	0.10-0.20 mmol/mL	0.04-0.085 mmol/mL
Binding capacity1	6-12 mg BSA/mL resin	12 mg BSA/mL resin
Operational pressure	⩽1.0 MPa	⩽0.3 MPa
Operational flow rate	100-600 cm/h	100-600 cm/h
pH stability	3-13	3-13
Temperature	4-30℃	4-30℃
Chemical stability	All commonly used aqueous buffers, 1 M sodium hydroxide (NaOH), 6 M guanidine hydrochloride, 30% isopropanol, and 70% ethanol.	
Storage	20% ethanol at 4°C to 25 ℃	

Instruments & Parts

GALAK provides selected instruments and parts that are used in HPLC systems.

- Packing system for HPLC columns
- High-pressure Injection Pump
- Low-pressure Glass Column
- Injection Loop
- Oligo Synthesis Column
- Empty HPLC Column
- Accessories for HPLC system

Packing System For HPLC Column

GLK Packing Systems are designed for packing analysis, semi-preparative and preparative HPLC columns.

GLK 1000, designed for packing analytical columns only, is suitable for the packing of conventional silica-gel and polymer HPLC columns.

GLK 2000, with higher pressure and power, are designed for both analytical and preparative columns with inner diameter 10~50mm.

Customized homogenate tanks suitable for HPLC columns are provided optional.

GLK HPLC Column Packing System is widely used in many famous universities and research institutions such like Tsinghua University, Sichuan University, Zhengzhou University, Dalian Institute of Chemical Physics Dalian Ocean University.

Advantage:

- Desktop level device. It could be put in a moving cart.
- Compressed air for power. No electricity required.
- The main machine is practical, robust and durable.
- Customized accessories such as homogenate tanks and connectors.

Service:

- One year warranty
- Free replacement parts
- Free online training for operation and maintenance
- Recovery of old equipment

Parameters:

	GLK1000	GLK2000
Column ID	2.0/2.1/4.6/10 mm	4.6/10/20/30/50 mm
Output Pressure	9800 psi	15000 psi
Flow Rate	3.3L/min	3.3L/min
Output Power	1.5hp	2hp
Air Cylinder	Single	Double
Size	50*40*20cm	60*40*20cm
Weight	15kg	20kg

Control Panel

1 Pressure gauge

2 Pressure regulator

3 Liquid inlet:

4 Inlet A:

5 Inlet B:

6 Liquid outlets:

Homogenate Tank & Connector

Equipment Accessories

Standard Parts	Optional Parts
Operation instruction	Air compressor
Pneumatic booster pump	Air purification system
Control panel	Homogenate tanks
Homogenate tank support (mini)	Column connection (ID 2.1-50mm)
Stainless steel connections	Empty HPLC column (ID 2.1-50mm)
Stainless steel column	Packing materials

Notice:

1. Nitrogen compressed air cylinder could replace air compressor and air purification system.
2. The compressed air must be purified before entering the packing system.

High-pressure Injection Pump

Eldex Optos Electronic Metering Pump

Eldex pumps are produced in the USA. Integrating the latest technology and electronics, Eldex's Optos Series designed and manufactured with reciprocating piston pumps for a wide variety of applications.

- Smooth fluid delivery from intra
- RPM stepper motor control
- Remote flow rate control via analog signal or RS232 command
- Optional liquid ends for expanded flow rate range
- Integrated piston wash system

With upgrade to Plus Version

- Pressure monitoring with high and low pressure limits
- Integrated low volume pulse damper

Model 1

	Flow Rate (mL/min)	Max. Pressure (psi)	Piston Diameter (in.)	Piston Stroke (in.)	Model
316 stainless steel	0.002 - 2.5	6000	3/32	.125	1LM
	0.003 - 5	6000	1/8	.125	1SM
	0.01 - 20	3000	1/4	.125	1HM
	Flow Rate (mL/min)	**Max. Pressure (psi)**	**Piston Diameter (in.)**	**Piston Stroke (in.)**	**Model**
PEEK	0.002 - 2.5	4000	3/32	.125	1LI
	0.003 - 5	4000	1/8	.125	1SI
	0.01 - 20	3000	1/4	.125	1HI

Model 2

	Flow Rate (mL/min)	Max. Pressure (psi)	Piston Diameter (in.)	Piston Stroke (in.)	Model
316 stainless steel	0.003 - 5	6000	3/32	.250	2LM
	0.01 - 10	6000	1/8	.250	2SM
	0.02 - 40	1500	1/4	.250	2HM
PEEK	Flow Rate (mL/min)	Max. Pressure (psi)	Piston Diameter (in.)	Piston Stroke (in.)	Model
	0.003 - 5	4000	3/32	.250	2LI
	0.01 - 10	4000	1/8	.250	2SI
	0.02 - 40	1500	1/4	.250	2HI

Model 3

	Flow Rate (mL/min)	Max. Pressure (psi)	Piston Diameter (in.)	Piston Stroke (in.)	Model
316 stainless steel	0.01 - 10	3000	3/32	.500	3LM
	0.01 - 20	1500	1/8	.500	3SM
	0.04 - 80	750	1/4	.500	3HM
PEEK	Flow Rate (mL/min)	Max. Pressure (psi)	Piston Diameter (in.)	Piston Stroke (in.)	Model
	0.01 - 10	3000	3/32	.500	3LI
	0.01 - 20	1500	1/8	.500	3SI
	0.04 - 80	750	1/4	.500	3HI

Optos Plus Model: Minimize Pulsation, Monitor Pressure

Add Plus to your Optos Series pump to integrate a pulse damper to further reduce pulsation and have the ability to monitor pressure and set high and low pressure limits. Plus is available on L and S piston pumps.

	Flow Rate* (mL/min)	Max. Pressure (psi)	Piston Diameter (in.)	Piston Stroke (in.)	Model
316 stainless steel	0.002 - 2.5	6000	3/32	.125	1LMP
	0.003 - 5	6000	1/8	.125	1SMP
	Flow Rate* (mL/min)	**Max. Pressure (psi)**	**Piston Diameter (in.)**	**Piston Stroke (in.)**	**Model**
PEEK	0.002 - 2.5	4000	3/32	.125	1LIP
	0.003 - 5	4000	1/8	.125	1SIP

Common Specifications

Wetted Parts: For 316: Type 316 stainless steel, sapphire, ruby, gold, UHMW Polyethylene, CTFE (consult factory for other options)

For PEEK: PEEK, sapphire, ruby, UHMW Polyethylene, inert polymers

Reproducibility: typically +/-0.3%

Viscosity Limit: 500 centipoise

Tubing Connections: Consult factory for additional options

For 316: Low and Standard Flow Liquid End pumps:

Inlet valves: 1/4”-28 plastic fitting for 1/8” plastic tubing Outlet valves: 10-32 tube nut, ferrule for 1/16” tubing

For 316: High Flow Liquid End pumps: Inlet and outlet valves: 1/8” Swagelok®

For PEEK: Low and Standard Flow Liquid End pumps:

Inlet valves: 1/4”-28 plastic fitting for 1/8” plastic tubing Outlet valves: 1/4”-28 plastic fitting for 1/16” tubing

For PEEK: High Flow Liquid End pumps: Inlet and outlet valves: 1/4”-28 plastic fitting for 1/8” tubing

Control Options: Voltage: 0-5 VDC; Current Loop: 4-20 mA; RS232

Contact Closure & Outputs: Remote run and stop, pressure output (0-5V), pump error output.

Dimensions: 10 cm W x 23 cm H x 24 cm D (4” W x 9” H x 9.5” D)

Weight: with Plus: 6.4 kg (14 lbs.); w/o Plus: 5.3 kg (11.75 lbs.)

Electrical: 100-230VAC (+/- 10%); 50/60Hz

VA Rating: 80

CE Certified

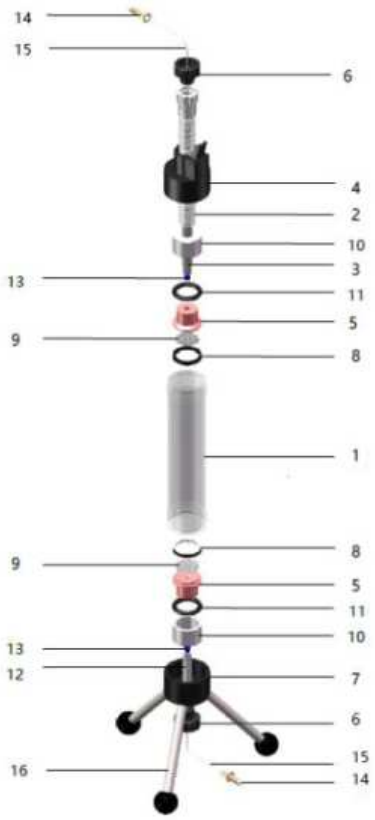
Single-layer Glass Columns

GALAK chromatography glass columns are designed for the standard liquid chromatography of macromolecules. The design is based on high reproducibility and precision results. The columns are compatible with aqueous solution and organic solvent in liquid chromatography. The GALAK column head is applied with chromatography column which includes a head and a bottom. A larger scale of column bed height can be obtained if the bottom part is replaced with another GALAK column head.

Advantages

- Pressure-resistant borosilicate glass, visualization and stability
- Supporting foot, adjustable level, convenient for users to use
- Reasonable price, high cost performance
- Reproducibility, excellent column efficiency and reliable results
- Zero dead volume structural connections

No	Name	Material
1	Glass Tube	Borosilicate glass
2	Screw	POM
3	Compression bar	POM
4	Screw cap	POM
5	Piston	PP
6	Compression nut	POM
7	Screw cap	POM
8	Filter	PA/PP
9	Support net	PP
10	Screw cap	POM
11	O-ring	VITON (EPDM)
12	Compression bar	POM
13	Locking ring	ETFE
14	Connector	PEEK
15	Capillary	PFA
16	Support Legs	304



Working Temperature	4-40℃
pH Range	1-14
Chemical Stability	Tolerant to salt, acid, alkali, and a small number of organic solvents alcohols, ketones, phenols.
Column Material	Borosilicate glass
Column Head Material	PTFE
Thread-end Material	PEEK
Seal Ring Material	PTFE/EPDM
Tubing Material	1/16&1/8
Connector Material	PEEK 1/16&1/8

No.	Internal Diameter (mm)	Length (mm)	One-side Adjustable Type		Double-side Adjustable Type		Pressure (bar)
			Volume (mL)	Bed Height (cm)	Volume (mL)	Bed Height (cm)	
YS16/200	16	200	4-30	2-14.5	0-30	0-14.5	7
YS16/400	16	400	46-72	22-34.5	17-72	8.5-34.5	7
YS16/1000	16	1000	173-199	82-94.5	144-199	68.5-94.5	7
YS26/200	26	200	10-73	2-14.5	0-73	0-14.5	7
YS26/400	26	400	111-174	22-34.5	43-174	8.5-34.5	7
YS26/1000	26	1000	415-479	82-94.5	347-479	68.5-94.5	7

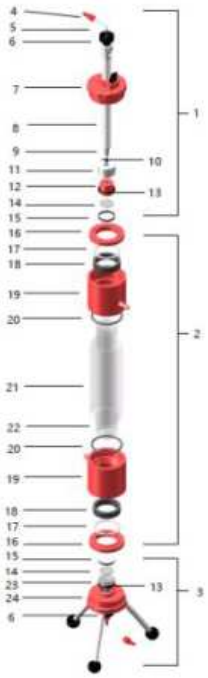
BSXK Double-layer Glass Columns

BSXK glass columns are made of borosilicate glass. They allow visual inspection of media bed and exhibit excellent chemical resistance. Column packing can be performed using either a packing reservoir or extra column tube attached with a packing connector. QuickLock of the adapter shaft facilitates rapid and easy movement of the adapter, simplifying adjustments of the bed height and cleaning. Adapter plunger gives a uniform flow which maintains the integrity of the packed bed during operation.

Advantages

- Pressure resistant glass column tube can be used to clearly observe the column bed
- The column head ensures uniform buffer distribution and repeated loading
- Unique support foot design can adjust the level after placement
- Various specifications, inner diameter: 10, 16, 26, 50mm
- Maximum compression at one end is 17cm, and 2 * 17cm at both ends
- Direct connection with mainstream purification system

Number	Name	Number	Name
1	Column Head	14	Support net
2	Column tube	15	Sieve
3	Column base	16	Locking pressure ring
4	Pipe joint	17	Gasket
5	Capillary	18	Sealing ring
6	Compression nut	19	Connector
7	Screw cap	20	O-ring
8	Screw	21	Acrylic tube
9	Pressure bar	22	Glass tube
10	Seal lock ring	23	Lower piston
11	Piston gland	24	Lower screw cap
12	Upper piston	25	Support leg
13	O-ring		



Working Temperature	4-40℃
pH Range	1-14
Chemical Stability	Tolerant to salt, acid, alkali, and a small number of organic solvents alcohols, ketones, phenols.
Column Material	Borosilicate glass
Column Head Material	PTFE
Thread-end Material	PEEK
Seal Ring Material	PTFE/EPDM
Tubing Material	1/16&1/8
Connector Material	PEEK 1/16&1/8
Max. Pressure	5 bar

No.	Internal Diameter (mm)	Length (mm)	One-side Adjustable Type		Double-side Adjustable Type	
			Volume (mL)	Bed Height (cm)	Volume (mL)	Bed Height (cm)
BSXK10/150	10	150	-		0-12	0-11
BSXK10/200	10	200	-		0-25	0-16
BSXK10/400	10	400	-		0-68	21-36
BSXK10/1000	10	1000	-		0-150	81-96
BSXK16/200	16	200	4-30	2-14.5	0-30	0-14.5
BSXK16/400	16	400	46-72	22-34.5	17-72	8.5-34.5
BSXK16/700	16	700	109-136	52-64.5	81-136	38.5-64.5
BSXK16/1000	16	1000	173-199	82-94.5	144-199	68.5-94.5
BSXK26/200	26	200	10-73	2-14.5	0-73	0-14.5
BSXK26/400	26	400	111-174	22-34.5	43-174	8.5-34.5
BSXK26/700	26	700	263-326	54-64.5	195-326	38.5-64.5
BSXK26/1000	26	1000	415-479	82-94.5	347-479	68.5-94.5
BSXK50/200	50	200	19-275	1-14	0-275	0-14
BSXK50/300	50	300	215-471	11-24	0-471	0-24
BSXK50/600	50	600	804-1060	41-54	549-1060	28-54
BSXK50/1000	50	1000	1589-1849	81-94	1334-845	68-94

Low-Pressure Chromatography Column

Low-pressure chromatography columns are pressure compressible glass columns designed for hygienic operation and simple, efficient loading, primarily for process development or biopharmaceutical production.

Patent column head sealing technology

- The lever-pressing sealing structure was used with high reliability, which prevents the problem that the pneumatic mechanism easy to leak and invalid.
- The expansion structure of pressurizing-down style gasket ring prevents column head departing from bed caused by the pull-up structure.
- Minimized Hold-up Volumes, Easy to clean and change the seal.

Patent column head rotating structure

- The column head rotates by the rotating screw of the column pipe, which is on the upper surface of the flange plate. After rotating in place, the second screw needs to be inserted. Media packing can be done after rotating the column head. It is easy to operate, without carrying out the column head.

Predictable linear scale-up

- Fix condition: Linear flow rate, buffer, packing material, bed height, sample concentration, and pH, sample volume, and bed volume ratio.
- Scale-up condition: Column I.D., volume flow rate, sample volume.

Product	Column Inner Diameter (mm)	Sectional Area (cm^2)	Column Height (mm)	Column Bed Height (cm)		Column Bed Volume (L)		Max. Pressure (bar)	Net Wight (Kg)
				Min	Max	Min	Max		
MPC100/500	70	38.5	500	0	35	0	1.4	8	14
MPC100/750	70	38.5	950	40	80	1.5	3.1	8	14
MPC100/500	100	78.5	500	0	35	0	2.7	8	18
MPC100/750	100	78.5	750	20	60	1.6	4.7	8	20
MPC100/950	100	78.5	950	40	80	3.1	6.3	8	21
MPC140/500	140	154	500	0	35	0	5.4	6	30
MPC140/750	140	154	750	20	60	3.1	9.2	6	33
MPC140/950	140	154	950	40	80	6.2	12.3	6	35
MPC200/500	200	314	500	0	35	0	11	6	36
MPC200/750	200	314	750	20	60	6.3	18.8	6	39
MPC200/950	200	314	950	40	80	12.6	25.1	6	42
MPC300/500	300	706.5	500	0	35	0	24.7	4	58
MPC300/750	300	706.5	750	20	60	14.1	42.4	4	63
MPC300/950	300	706.5	95	40	80	28.2	56.5	4	67
MPC450/500	450	1560	50	0	35	0	55.6	3	230

Adaptor For Glass Column

The adaptor is matched with the glass column.

YS columns: 130ml / 320ml

BSXK columns: 30ml / 130ml / 320ml / 420ml / 1200ml

HT columns: HT10/110, HT26/100, HT49/100

Injection Loop

GALAK injection loop can be incorporated into a pressurized packing device for large volume samples and used in conjunction with the sampling valve.

Advantage

- Flexible injection of different volumes of samples
- High reproducibility and recovery
- Internal dynamic seal allows the sample to be released

Sample Volume

- 10mL
- 50mL
- 150mL

Oligo Synthesis Column

Adjustable Oligo synthesis columns are designed for oligonucleotide synthesis and can withstand the harsh organic conditions of oligonucleotide synthesis.

- Adjustable column bed height recommended working height between 3 and 10 cm
- Column diameter of 35 mm and volume range of 10 mL to 100 mL
- The column can withstand the harsh organic conditions in synthesis
- The columns are easy to handle and the solid phase carriers are easily packaged

Oligo columns are also available for large-scale synthesis in 70mm, 100mm, 200mm and 350mm diameters.

Product	Inner Diameter	Height
Oligo35 Column	35mm	150mm
Oligo50 Column	50mm	250mm
Oligo100 Column	100mm	500mm

Small stainless steel synthesis columns are designed as fixed volume synthesis column reactors (equipped with filters and seals) for oligonucleotide synthesis.

- Synthetic columns are manufactured to high standards to withstand the harsh organic conditions of oligonucleotide synthesis
- Made of 316L stainless steel
- Available in 1.2 ml, 6.3 ml, 12 ml, 24 ml and 48 ml sizes

Oligo columns are also available for large-scale synthesis in 70mm, 100mm, 200mm and 350mm diameters.

Product	Volume	Inner Diameter	Height
Oligo1.2	1.2ml	10mm	15mm
Oligo6.3	6.3ml	20mm	20mm
Oligo12	12ml	27mm	21mm
Oligo24	24ml	35mm	25mm
Oligo48	48ml	44mm	32mm

HPLC Column Hardware

GALAK empty columns are designed for HPLC system. The column tube is made of high quality 316L stainless steel tube and precision machining.

- high-purity 316 L stainless steel tubing material.
- Passivated column tube for good acid and alkali resistance..
- Roughness of tube inner wall Ra0.3.
- Circular cross-section.
- High consistency and reproducibility.
- Sieve plates are easy to replace and clean.
- Low dead volume.
- OEM is available.

Column Size:

- Inner diameter: 2.1mm, 3.0mm, 4.0mm, 4.6mm, 7.8mm, 10mm, 20mm, 21.2mm, 30mm, 50mm
- Length: 25mm, 30mm, 50mm, 100mm, 150mm, 250mm, 300mm, 500mm
- Frits: 2um (optional 0.5um, 1um, 3um, 5um, 10um)
- Connector:1/16” (optional 1/8”)

Frits For HPLC column

Inner diameter: 2.1mm, 3.0mm, 4.0mm, 4.6mm

Material: 316L stainless steel & PEEK

In-filter for HPLC column

Type:

10mm I.D.

20mm I.D.

30mm I.D.

GALAK
CHROMATOGRAPHY

GALAK Chromatography Technology Co., LTD.

88th Meiliang Rd, Mashan, Wuxi,China
Tel: +86 510 85992929 Fax: +86 510 85104949
Email: sales@galak-tech.com
www.galak-tech.com(CN) www.galaklc.com(US)