Driving the innovation
SUNRESIN
STOCK CODE 300487

Seplife® Polymer-based Chromatography Resins

SEPLIFE

- Affinity Chromatography Resins
- Ion Exchange Chromatography Resins (IEX)
- Hydrophobic Interaction Chromatography Resins (HIC)
- Gel Filtration Chromatography Resins (GF)
- Reversed-phase Chromatography Resins (RP)

Sunresin New Materials Co., Ltd.
Suzhou Sunresin Biotech Co., Ltd

Driving the innovation
SUNRESIN

Sunresin New Materials Co.Ltd.

Sunresin is an innovation oriented high-tech enterprise, specializing in supplying ion exchange resins, adsorption and chromatography resins, equipment solutions and relevant technical services. With 20 years of manufacturing experience, it is the only listed company in the IER industry (Shenzhen Stock code 300487) in China. Sunresin has 8 subsidiaries, 3 overseas branch offices, as well as 5 state-of-the-art manufacturing facilities around the world. Sunresin produces over a hundred resin products covering a wide range of applications for separation and purification. Sunresin's products portfolio includes about 30 product categories and more than 100 different resin references which are commercialized in over 100 countries and broadly used in industries such as Water and wastewater treatment, Food Processing, Biotech, Pharmaceuticals, Plant Extraction, Membrane Caustic Soda, Hydrometallurgy, as well as Municipal Water Treatment among others.

Sunresin focuses on innovation, quality and services. Sunresin holds more than 30 patents, in China and internationally, and has accomplished more than ten national projects in the area of resin development. Sunresin is certified under ISO 9001 for Quality Control System and ISO14001 for Environment Control System. It has also been awarded with Certificates from WQA Golden Seal, Kosher, CE, Halal, etc. Under worldwide recognized QC systems, Sunresin provides excellent and high quality products to the market. All of the employed manufacturing processes are strictly controlled by the environmental regulations.

Based on the technical competence, the rich experience and under strict international standards, Sunresin supplies high quality products at a fast delivery time, cost-effective equipment, professional design and solution, as well as proactive customer services to our customers.

GB/T 19001 GB/T 24001 GB/T 45001 GB/T 23331

Administration & R&D


Sunresin Park, Headquarter


Sunresin Biotech, Suzhou


Sunresin, R&D center


SR-Nankai University Joint R&D center

Manufacturing


Sunresin, Gaoling


Sunresin, System Engineering Park


Sunresin, Special Resin Factory


Sunresin, Pucheng


Sunresin, Suncycle Hebi


Sunresin, Puritech Belgium

Suzhou Sunresin Biotech Co., Ltd

Suzhou Sunresin Biotech Co., Ltd, a wholly-owned subsidiary of Sunresin New Materials Co., Ltd (Stock Code: SZ300487), is a leading high-tech company specializing in the R&D and production of chromatography resins for the downstream separation and purification process of biomedicines, cell culture microcarriers, solid-phase synthesis carriers (polypeptides and nucleic acid) as well as immobilized enzyme carriers. The company is also a solution provider for process development of the chromatography systems for customers.

Located in the Suzhou Industrial Park (SIP), Sunresin Biotech leverages its parent company's technology platform in developing agarose, dextran and polymer-matrix resins and rich industrial purification experiences to provide purification products and materials to the pharmaceutical and biotech industries. It is committed to becoming China's leading chromatography resins supplier and pushing the industry to a new height around the world.

• Standardized Products

Sunresin has a complete production line for agarose-matrix, dextran-matrix, and polymer-matrix chromatography resins, with an annual production capacity of 50,000L in total. The product quality is stable and has reached the international leading level.

• Core competitiveness

The key technicians of Sunresin have nearly 20 years of experience in the development, production and application of agarose matrix, dextran matrix and polymer matrix chromatography resins. With rich product categories and reliable performance, we can also provide customized services for specific products and requirements of customers on the basis of standardized products, and develop tailored products not only to meet the customers' needs but also help them enhance their competitiveness in the market through optimized process.

• Strict Product Quality Control

Sunresin has invested significantly in world-leading top testing instruments and has established its own quality management system and norms in strict accordance with GHS, ISO9001 and the guidelines of pharmaceutical production related management norms. From raw materials to production process control and finished product testing, all methods and processes are performed in strict accordance with the documents to ensure stable product quality and provide guarantee for the safety and stability of the products.

• Complete Evaluation System

Sunresin has established a complete product evaluation system. With experienced technicians and facilities and first-class application evaluation laboratory, we can conduct all-round performance evaluation of the chromatography resins.

• Solution Provider in Process Development

Sunresin can design and develop a product purification process that meets future production and linear scale-up requirements by combining cell culture methods and separation and purification technology with the performance of our chromatography resins. We can also work with customers to optimize their original production process to improve stability, increase yield and reduce cost.

• Stable Automated Production Control

Sunresin has developed its own world-leading automated console system to monitor the production operation in real time and avoid the influence of human impacts on product quality to the maximum extent, leading to a guaranteed reproducibility and stability of the products.

Quality Control and Performance Evaluation at Sunresin

Electron microscope - morphology analysis

Malvern laser analyzer - particle size analysis

Liquid chromatography- reagent residue analysis

Water content measurement

ICP - Heavy metal content test

Pore volume, pore size measurement

Automatic acid-base titrator

Fourier-transform infrared spectroscopy- structural analysis

ÄKTA protein purification system - chromatographic performance test

SEPLIFE

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Polymer-based Chromatography Resins

Seplife® polymer-based chromatography resins are mainly used in the preparation, separation and purification process of biomacromolecules, biomolecules, peptides, chemical drugs, natural products and other small molecules to improve product quality and process economy. Antibodies, antigens, polypeptides, hormones, enzymes and growth factors are important components of biological products. The economical and efficient purification and separation scheme is the key factor to determine the success of production. The choice of chromatography resins and process must be safe and effective, which can effectively remove impurities such as host cell proteins, DNA, viruses, and endotoxins, and maintain the activity and recovery rate of quality effective substances.

With the development of the biopharmaceutical industry, how to improve the purification efficiency of downstream processes is a new challenge for all manufacturers. Therefore, rigid structures with strong hydrophilicity (high pressure resistance, high flow rate) are used more and more in chromatography materials, and are widely welcomed by manufacturers and technology developers. Seplife® polymer chromatography resins adopt unique skeleton synthesis, surface hydrophilic modification, group bonding and other technologies, so that the resin has the characteristics of good hydrophilicity, high loading capacity, long service life and high flow rate, which is different from traditional chromatography resins compared with this method. The production efficiency of the downstream purification process is therefore greatly improved, the cost is reduced, and better economic benefits are created.

• Chromatographic technology and applicable objects

Purification target	Chromatography technologies
Antibody	Affinity, IEX, Multi-modal
Recombant protein	IEX, Affinity, Size Exclusion, Reverse-phase
Blood products	IEX, Affinity, Size Exclusion
Vaccine (human and veterinary)	IEX, Size Exclusion, Microcarrier (cell culture), Multi-modal
Nucleic acid	Affinity, IEX, Reverse phase
Peptide	IEX, Reverse phase
Biological small molecule	IEX, Reverse phase
Natural products	Reverse phase, LH-20

• Characteristics of the resins

Strengths	Achieved effects
Relatively high dynamic capacity at high flow rate	High output
High pressure resistance, high flow rate	High production efficiency
Good chemical stability	Easy for CIP
High selectivity and binding force of target substance	High yield
High recovery of target activity	High output
Uniform particle size distribution	High resolution
Efficient impurity removal ability (virus, endotoxin, DNA, etc)	High purity products
Complete regulatory support documents	Process validation and audit support

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Affinity Chromatography Resins

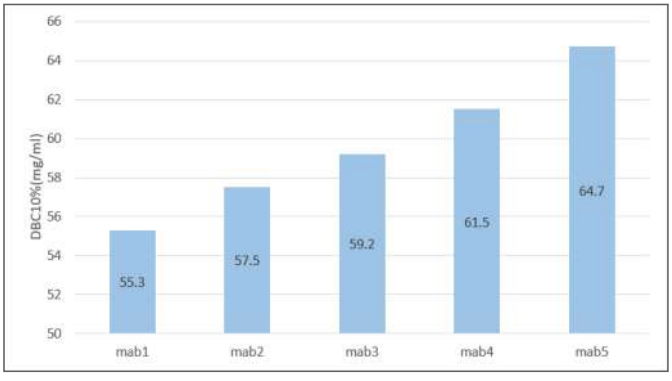
Highly hydrophilic polymer protein A affinity resins

rProtein Seplife® Accel 50 is specially designed and developed by Sunresin to meet the needs of large-scale production of antibodies, with polymethyl methacrylate as the matrix, coupled with highly alkali-resistant protein A ligand. This product combines Sunresin's proprietary Monojet uniform particle size distribution, precise pore-forming, surface modification (hydrophilic modification of long-chain spacer arms), ligand coupling and other technologies, giving the product high rigidity, low back pressure, high dynamic binding capacity, biocompatibility comparable to agarose-based matrix, and high aggregate removal efficiency. This product complements the company's agarose matrix protein A affinity resins, effectively meeting the diversified application scenarios of different customers.

• Technical parameters

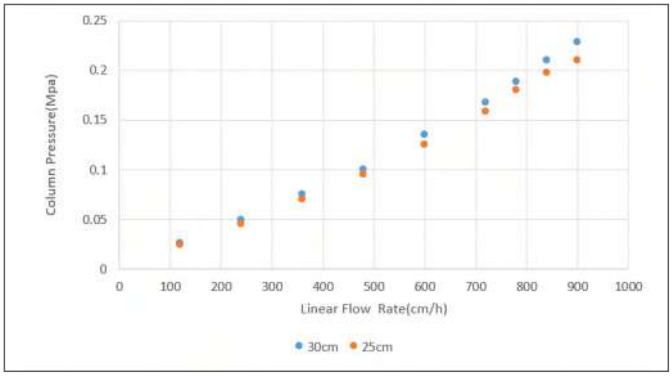
Product name	rProtein Seplife® Accel 50
Physical appearance	White spherical beads
Matrix	Polymethylmethacrylate
Ligand	Alkali-resistant recombinant protein A
Pressure resistance (MPa)	0.8
Particle size D50(μm)	50
Dynamic binding capacity (mg/ml, human polyclonal IgG)	55-65 (residence time 5 mins)
Alkali resistance	0.1-0.5M NaOH
Recommended flow rate (cm/h)	100-800
pH stability	2-12
Chemical stability	All common buffers, 1M acetic acid, 1M hydrochloric acid, 100% ethanol, isopropanol and other common organic solvents, avoid long-term contact with strong acids and alkalis
Operating temperature	2-40℃
Storage condition	20% ethanol or benzyl alcohol, 2-8℃
Characteristics	High rigidity, high binding capacity, high alkali resistance, good biocompatibility, suitable for large-scale production of monoclonal antibodies and bispecific antibodies.

• Dynamic binding capacity test



Dynamic binding capacities of rProtein A Seplife® Accel 50 for different antibodies

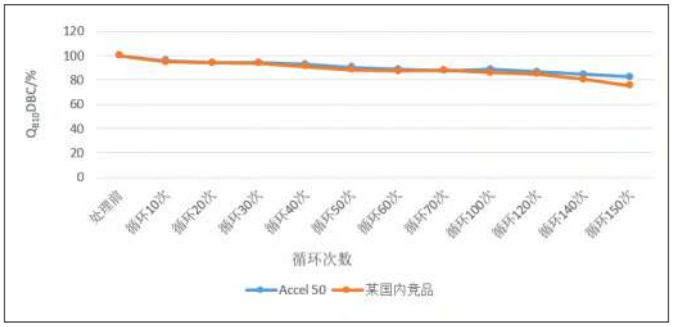
• Pressure resistance test



Pressure / flow rate curve, column specifications: XK16mmx400mm

Alkali resistance and protein A shedding test

Mobile phase A1: 20mm PBS+0.15MNaCl, pH7.4
Mobile phase B1: 50mmol/L glycine-hydrochloric acid pH3.0
Mobile phase B2: 20mm PBS+1.0 NaCl, pH7.4
Mobile phase A2: 0.5M NaOH
Mobile phase A3: 0.1M NaCl
Set the detection wavelength to 280nm, equilibrate with buffer A1 for 3CV, flow B2 for 3CV, mobile phase B1 for 3CV, and mobile phase A2 for 3CV (residence time 30min).
Buffer A1 equilibrates 3CV. Repeat the above steps for 150 cycles. The eluate is collected and tested for Protein A shedding with an ELISA kit.



Dynamic capacity retention after 150 cycles of 0.5M NaOH

Protein A shedding after 150 cycles of 0.5M NaOH

Ordering information

Product	Ref. No.	Pack Size
rProtein A Seplife® Accel 50	PM51324X(50)1-0	5ml
	PM51324X(50)1-1	25ml
	PM51324X(50)1-2	100ml
	PM51324X(50)1-3	500ml
	PM51324X(50)1-4	1L
	PM51324X(50)1-5	5L
	PM51324X(50)1-6	10L

Oligo dT affinity resins

Seplife® Oligo dT is a new type of high-rigidity polymer affinity resin independently developed by Sunresin, mainly used to capture mRNA. Seplife® Oligo dT is based on polystyrene and has a super large uniform pore size. The surface is modified with a specific long-chain spacer and bonded with a self-developed dT ligand. It has a high binding capacity, high specific adsorption, low non-specific adsorption, and can withstand high temperature (65°C).

• Technical parameters

Product name	Seplife® Oligo dT
Physical appearance	White to light yellow spherical beads
Type	Affinity resins
Matrix	Polystyrene
Ligand	dT20
Particle size (μm)	50
Ligand density (μmol dT/mL)	0.25-0.35
Operating temperature	2~65℃
Compression factor	1.06
Pressure flow rate (cm/h)	1000 (0.15MPa condition), adjust the flow rate according to the actual use to avoid exceeding the maximum pressure limit
Pressure resistance (MPa)	10
pH stability	2-13 (Operational)
Ionic strength	0 to 5M, commonly used saline solution
CIP	0.1M NaOH
Dynamic binding capacity (mg/ml, polyA 200)	≥ 2 (residence time 1 min)
Alkali resistance	0.1-0.5M NaOH
Buffer	Common buffer solution for mRNA purification: 0.5 M NaOH, 2 M MgCl, 20 mM EDTA; Avoid exposure to conditions such as strong oxidizing agents (such as hypochlorite), oxidizing acids (such as nitric acid), strong reducing agents (such as sulfites), acetone, tetrahydrofuran or benzyl alcohol
Common solvents	Water, 0~100% ethanol, acetonitrile, 2M acetic acid, 1M hydrochloric acid and other common organic solvents. Avoid exposure to conditions such as strong oxidizing agents (such as hypochlorite), oxidizing acids (such as nitric acid), strong reducing agents (such as sulfites), acetone, tetrahydrofuran, or benzyl alcohol
Storage condition	20% ethanol, 2-8℃

• Ordering information

Product	Ref. No.	Pack Size
Seplife® Oligo dT	PS11225X(50)1-1	25ml
	PS11225X(50)1-2	100ml
	PS11225X(50)1-3	500ml
	PS11225X(50)1-4	1L
	PS11225X(50)1-5	5L
	PS11225X(50)1-6	10L

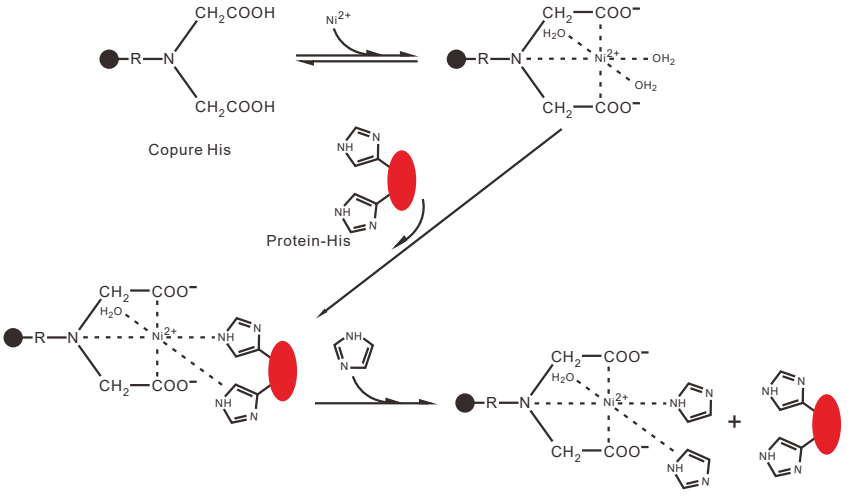
Metal chelate affinity resins

The enrichment and purification of recombinant proteins generally use tags of known size. After the recombinant expression, the specific interaction between the tag and the chromatography media is used to achieve the effect of separation and purification. Immobilized metal ion or metal chelate affinity chromatography (IMAC) uses certain amino acids (such as histidine, tryptophan, cysteine, etc.) on the protein surface and transition metal ions (Ni^{2+}, Cu^{2+}, Zn^{2+}, Co^{2+}, Fe^{3+}, etc.) are combined with coordination bonds to achieve the separation of proteins with different tags.

The factors that affect the integration of protein and metal ions are mainly the amino acids (type, number and distribution) that can be combined on the surface of the protein, the type and density of metal ions, and chromatographic conditions (pH, type and concentration of salt, additives, etc.). Immobilized metal ion affinity chromatography media has the advantages of large adsorption capacity, good selectivity, high resolution, easy regeneration, and low cost, especially for the separation and purification of histidine tag (His-Tag) protein.

The immobilized metal ion affinity chromatography medium by Sunresin Technology is based on polymethyl methacrylate, and the surface hydrophilicity has been improved. It has good physical and chemical stability, biocompatibility and solvent compatibility and is widely used in the separation and purification of biological macromolecules.

Seplife® LXPM IMAC5504IDA and Seplife® LXPM IMAC5504NTA are media for chelating and fixing metal ions. Users can chelate different transition metal ions (Ni^{2+}, Cu^{2+}, Zn^{2+}, Co^{2+}, Fe^{3+}, etc.) according to their needs. Seplife® LXPM Ni 5504IDA and Seplife® LXPM Ni 5504NTA are pre-chelated Ni^{2+} media, and users can use them directly without chelating to fix metal ions.

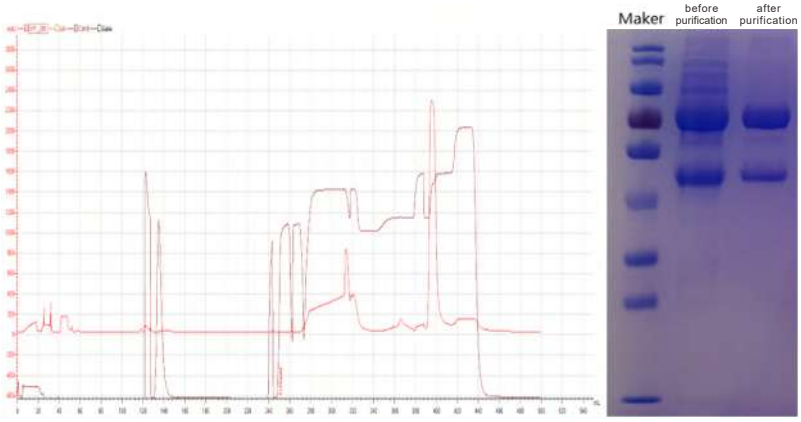


• Technical Parameters

Reference / Parameter	Seplife® LXPM5504IDA	Seplife® LXPM5504NTA	Seplife® LXPMNi5504IDA	Seplife® LXPMNi5504NTA
Matrix	Polymethylmethacrylate			
Functional group	$-N(CH_2COOH)_2$	$-N-(CH_2COOH)_3$	Ni^{2+}	Ni^{2+}
Particle size (μm)	80	80	80	80
Pore size (Å)	1000	1000	1000	1000
Maximum pressure (Mpa)	0.8	0.8	0.8	0.8
Linear flow rate (cm/h)	100-800	100-800	100-800	100-800
Capacity (Ni, umol/ml)	NA	NA	≧80	≧50
Dynamic binding capacity (His protein, mg/ml)	NA	NA	≧25	≧20
pH stability	2-12	2-12	2-12	2-12
Storage and transport	4-35℃, 20% ethanol	4-35℃, 20% ethanol	4-35℃, 20% ethanol	4-35℃, 20% ethanol
Features	High binding capacity	Low shedding	High binding capacity	High binding capacity
Storage	Chromatography media that are not to be used for the time being should be stored in 20% ethanol at 4-35°C, and the bottle cap should be tightly closed. The chromatographic column that has been installed should be stored in buffer solution (pH7.0) containing 20% ethanol.			

Case study

Seplife® LXPM-Ni5504IDA in the Production of Purified Foot-and-Mouth Disease Vaccine Feed Liquid



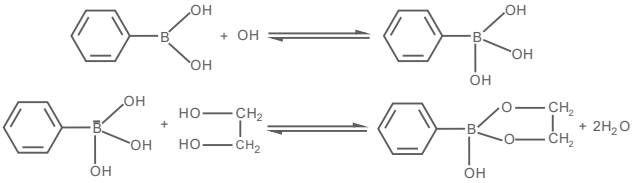
Ordering information

Product	Ref. No.	Pack size
Seplife® LXPM 5504IDA	PM51024M1-1	25ml
	PM51024M1-2	100ml
	PM51024M1-3	500ml
	PM51024M1-4	1L
	PM51024M1-5	5L
	PM51024M1-6	10L
Seplife® LXPM 5504NTA	PM51124M1-1	25ml
	PM51124M1-2	100ml
	PM51124M1-3	500ml
	PM51124M1-4	1L
	PM51124M1-5	5L
	PM51124M1-6	10L

Product	Ref. No.	Pack size
Seplife® LXPM Ni5504IDA	PM521024M1-1	25ml
	PM521024M1-2	100ml
	PM521024M1-3	500ml
	PM521024M1-4	1L
	PM521024M1-5	5L
	PM521024M1-6	10L
Seplife® LXPM Ni5504NTA	PM521124M1-1	25ml
	PM521124M1-2	100ml
	PM521124M1-3	500ml
	PM521124M1-4	1L
	PM521124M1-5	5L
	PM521124M1-6	10L

Boric Acid Affinity Resins (Boricacid Seplife LXPM5504)

Boricacid Seplife® LXPM5504 is based on polymethyl methacrylate matrix and coupled with boric acid compounds as ligands, which can be used for separation and purification by adsorption or desorption of cis-dihydroxy compounds under different pH conditions. It is widely applied to the separation and purification of glycoproteins, sugars, nucleosides, nucleic acids, peptides and enzymes.



Interaction of boric acid and cis-diol in aqueous solution

• Technical parameters

Product name	Boricacid Seplife® LXPM5504
Matrix	Polymethylmethacrylate
Particle size (μm)	80
Pore size (Å)	1000
Ligand density (μmol/ml)	20
Capacity (mg /ml, ConA)	≧10
Pressure resistance (MPa)	0.8
Recommended flow rate (cm/h)	100-800
pH stability	2-12
CIP	0.1-0.5M
Storage condition	20% ethanol, 2-8˚C

• Ordering information

Product	Ref. No.	Pack Size
Boricacid Seplife® LXPM5504	PM51524M1-1	25ml
	PM51524M1-2	100ml
	PM51524M1-3	500ml
	PM51524M1-4	1L
	PM51524M1-5	5L
	PM51524M1-6	10L

Heparin Affinity Resins (Heparin Seplife LXPM5504)

Heparin is an acidic polysaccharide containing sulfate, which can bind to biological macromolecules such as anticoagulant factor III, coagulation factor, lipoprotein, interferon, nucleic acid binding protein, restriction endonuclease, thrombin and thrombin-like macromolecules.

Heparin Seplife® LXPM5504 couples heparin sodium to the hydrophilic modified polymethyl methacrylate microspheres. By bonding the long-chain spacer arm, the steric hindrance is reduced, the loading capacity is greatly increased, and the non-specific adsorption is reduced.

It is widely used in the separation and purification of the above-mentioned biological macromolecules.

• Technical parameters

Product name	Heparin Seplife® LXPM5504
Matrix	Polymethylmethacrylate
Ligand	Heparin Sodium
Particle size (μm)	80
Pore size (Å)	1000
Ligand density (μmol/ml)	≧5
Capacity (mg /ml, anticoagulant factor III)	≧5
Pressure resistance (MPa)	0.8
Recommended flow rate (cm/h)	100-800
pH stability	4-10
Storage condition	20% ethanol solution containing 0.05mol/L NaAC at 4-8℃

• Ordering information

Product	Ref. No.	Pack Size
Heparin Seplife® LXPM5504	PM51824M1-1	25ml
	PM51824M1-2	100ml
	PM51824M1-3	500ml
	PM51824M1-4	1L
	PM51824M1-5	5L
	PM51824M1-6	10L

Ion Exchange Chromatography Resins (IEX)

Ion exchange chromatography (IEX) is the separation and purification of biomacromolecules according to the different charges on the surface of biomacromolecules. It is currently the most commonly used technology in downstream purification processes.

Sunresin's ion exchange chromatography medium uses a unique polymer synthesis technology to prepare uniform particle size beads with polymethacrylate (or polystyrene) as the matrix. The polymer beads are surface-hydrophilic modified to increase hydrophilicity, and then bonded with different ion-exchange groups through chemical synthesis.

Thanks to its good hydrophilicity, good chemical and physical stability and rigid structure, the ion exchange chromatography resins have good biocompatibility and service life, and improve the purification efficiency. Sunresin provides 3 different types of ion exchange media such as Seplife® LXMS, LXPM and LXPM ultra-large pores, covering the capture, intermediate purification and fine purification of antibodies, proteins, polypeptides, nucleic acids, antibiotics, natural products and other molecules, analysis and other purification stage applications, providing customers with an overall solution for biological sample purification from laboratory research and development to commercial production.

According to different ion exchange groups, Seplife series ion exchange packings have 6 different groups of ion exchange groups as shown in Table 1

4 types are anion exchange resins: Q, QAE, DMAE, DEAE

2 types are cation exchange resins: SP, CM

Table 1. The charging status of the ion exchange groups of different functional groups

Type of IEX resins	Structure of functional group				Charged state of functional groups				
					pH of the solution				
	Abbr.	Name	Structure	pKa	⩽2.5	2.5-5	5-7	7-11	≥11
Strong anion	Q	Quaternary Amino	$-O(CH_2)_2N^+(CH_3)_3$	≥12	Z=+1				Z=0
	QAE	Quaternary Aminoethyl	$-O(CH_2)_2N^+(C_2H_5)_3$						
Weak anion	DMAE	Diethylaminomethyl	$-CH_2NH^+(CH_2CH_3)_2$	≈10	Z=+1			Z=0	Z=-1
	DEAE	Diethylaminoethyl	$-O-(CH_2)_2NH^+(CH_2CH_3)_2$	6-9	Z=+1		Z=0	Z=-1	
Weak cation	CM	Carboxymethyl	$-OCH_2COO^-$	3-5	Z=0		Z=-1		
Strong cation	SP	Sulfonate propyl	$-O(CH_2)_3SO_3^-$	⩽2.5	Z=0	Z=-1			

+1 means positively charged ; -1 means negatively charged

Seplife® LXMS Monojet Polystyrene IEX resins

Seplife® LXMS ion exchange resins provide products with three pore sizes of 50nm, 100nm, and 150nm and three uniform particle sizes of 15, 30, and 50um. Its highly cross-linked nature allows the resins to withstand high operating pressures.
The three pore sizes of 50nm, 100nm, and 150nm cover the applications of capture, intermediate purification, and fine purification of antibodies, proteins, peptides, nucleic acids, antibiotics, and natural products with different molecular weights.

Advantages

- The unique pore-forming technology brings uniform pores and minimizes the influence of molecular weight.
- The unique hydrophilic modification technology and surface bonding technology enable the resins to have greater resolution and higher dynamic capacity. The packing compression factor is smaller (<1.05), much lower than dextran and agarose resins.
- More complete resin specifications, providing customers with professional customized services.
- High mechanical strength, low back pressure and improved production efficiency.

Technical parameters

Product name	Seplife® LXMS Series	
Matrix	Polystyrene - DVB	Polystyrene - DVB
Pore size(Å)	1000,1500	500
Particle size(μm)	50	15, 30
Range of flow rate(cm/h)	200-800	100-900
Pressure resistance(Mpa)	3	3
pH stability	1-14	1-14
Industrial process	Capture, intermediate purification, fine purification	Intermediate purification, fine purification
Main features	Super large pores, high capacity, high resolution, high salt resistance, high rigidity, low back pressure	High salt resistance, high capacity, high resolution, high rigidity, low back pressure
Applications	Separation and purification of antibodies, virus particles, nucleic acids, and macromolecular proteins	Purification of nucleotide analogs, oligosaccharides, insulin, peptides and small molecules below 30KDa, endotoxin removal, etc.
Regeneration	0.5-2M NaCl solution	
Cleaning	0.1-0.5M NaOH solution (or 50% ethanol)	
Storage	For the chromatography resins that are not to be used for the time being, they should be stored in 20% ethanol at 4~30℃, and the bottle cap should be tightly closed. For the chromatographic column that has been installed, it should be stored in buffer solution containing 20% ethanol (pH 7.0).	

Resin specifications

Reference	Particle size (μm)	Pore size (Å)	Ion exchage capacity (mmol/ml)	Dynamic loading capacity * (mg/ml)
Seplife® LXMS 50Q	50	1000	0.18-0.22	140
Seplife® LXMS 50HQ	50	1500	0.13-0.17	70
Seplife® LXMS 50S	50	1000	0.16-0.20	102
Seplife® LXMS 50HS	50	1500	0.10-0.14	70
Seplife® LXMS 30Q	30	500	0.07-0.10	55
Seplife® LXMS 30S	30	500	0.07-0.10	90
Seplife® LXMS 15Q	15	500	0.07-0.10	55
Seplife® LXMS 15S	15	500	0.07-0.10	90

* Dynamic adsorption capacity test conditions: Lysozyme samples are used for cations, and BSA samples are used for anions.

• Ordering information

Product	Ref. No.	Pack Size
Seplife® LXMS 50Q	PS30324X(50)1-1	25ml
	PS30324X(50)1-2	100ml
	PS30324X(50)1-3	500ml
	PS30324X(50)1-4	1L
	PS30324X(50)1-5	5L
	PS30324X(50)1-6	10L
Seplife® LXMS 50HQ	PS30325X(50)1-1	25ml
	PS30325X(50)1-2	100ml
	PS30325X(50)1-3	500ml
	PS30325X(50)1-4	1L
	PS30325X(50)1-5	5L
	PS30325X(50)1-6	10L
Seplife® LXMS 50S	PS30124X(50)1-1	25ml
	PS30124X(50)1-2	100ml
	PS30124X(50)1-3	500ml
	PS30124X(50)1-4	1L
	PS30124X(50)1-5	5L
	PS30124X(50)1-6	10L
Seplife® LXMS 50HS	PS30125X(50)1-1	25ml
	PS30125X(50)1-2	100ml
	PS30125X(50)1-3	500ml
	PS30125X(50)1-4	1L
	PS30125X(50)1-5	5L
	PS30125X(50)1-6	10L

Product	Ref. No.	Pack Size
Seplife® LXMS 30Q	PS40323X(30)1-1	25ml
	PS40323X(30)1-2	100ml
	PS40323X(30)1-3	500ml
	PS40323X(30)1-4	1L
	PS40323X(30)1-5	5L
	PS40323X(30)1-6	10L
Seplife® LXMS 30S	PS40123X(30)1-1	25ml
	PS40123X(30)1-2	100ml
	PS40123X(30)1-3	500ml
	PS40123X(30)1-4	1L
	PS40123X(30)1-5	5L
	PS40123X(30)1-6	10L
Seplife® LXMS 15Q	PS40323X(15)1-1	25ml
	PS40323X(15)1-2	100ml
	PS40323X(15)1-3	500ml
	PS40323X(15)1-4	1L
	PS40323X(15)1-5	5L
	PS40323X(15)1-6	10L
Seplife® LXMS 15S	PS40123X(15)1-1	25ml
	PS40123X(15)1-2	100ml
	PS40123X(15)1-3	500ml
	PS40123X(15)1-4	1L
	PS40123X(15)1-5	5L
	PS40123X(15)1-6	10L

Seplife® LXPM polymethacrylate IEX resins

This series of ion-exchange chromatography media is made of polymethacrylate-based beads using Sunresin's unique polymer synthesis technology. The beads are modified by precise pore-making technology and surface hydrophilic long molecules, and are coupled and bonded with different ion exchange groups.
Due to its good hydrophilicity, good chemical and physical stability and rigid structure, the ion exchange chromatography resin has good biocompatibility and service life, and improves the purification efficiency.
It covers the application of production and purification stages such as capture, intermediate purification, and fine purification of molecules such as antibodies, proteins, peptides, nucleic acids, antibiotics, and natural products, and provides customers with an overall solution for the industrial production of biological samples.

• Technical parameters

Product name	Seplife® LXPM650 Series	Seplife® LXPM5504 Series	Seplife® LXPM706 Series
Matrix	Polymethylmethacrylate	Polymethylmethacrylate	Polymethylmethacrylate
Pore size (Å)	1000	1000	1000
Particle size (μm)	80	50, 80	80
Range of flow rate (cm/h)	300-1000	300-1000	300-1000
Pressure resistance (MPa)	0.8	0.8	0.8
pH stability	2-13	2-13	2-13
Industrial process	Capture, intermediate purification	Capture, intermediate purification, fine purification	Capture, intermediate purification
Main features	Strong hydrophilicity, high capacity, low non-specific adsorption, high rigidity, low back pressure	High salt resistance, high load capacity, high resolution, high rigidity, low back pressure	Strong hydrophobic and strong ionic complex interaction, suitable for separation and purification of high-salt systems and macromolecular samples with special structures
Applications	Separation and purification of antibodies, vaccines, recombinant proteins, etc.	Separation and purification of antibodies, vaccines, recombinant proteins, etc.	Separation and purification of antibodies, vaccines, recombinant proteins, etc.
Regeneration	0.5-2M NaCl solution		
Cleaning	0.1-0.5M NaOH solution (or 50% ethanol)		
Storage	20% ethanol at 4~35℃. For the chromatographic column that has been installed, it should be stored in buffer solution containing 20% ethanol (pH 7.0).		

• Resin specifications

Reference	Particle size (μm)	Pore size (Å)	Exchange capacity (mmol/ml)	Dynamic loading capacity *(mg/ml)
Seplife® LXPM CM650M	80	1000	0.10-0.20	35
Seplife® LXPM SP650M	80	1000	0.10-0.20	60
Seplife® LXPM DEAE650M	80	1000	0.10-0.20	35
Seplife® LXPM Q650M	80	1000	0.15-0.25	140
Seplife® LXPM CM5504S	50	1000	0.26-0.30	118
Seplife® LXPM SP5504S	50	1000	0.09-0.13	115
Seplife® LXPM DEAE5504S	50	1000	0.09-0.13	90
Seplife® LXPM Q5504S	50	1000	0.08-0.12	110
Seplife® LXPM CM5504M	80	1000	0.26-0.30	105
Seplife® LXPM SP5504M	80	1000	0.13-0.17	110
Seplife® LXPM DEAE5504M	80	1000	0.08-0.12	90
Seplife® LXPM Q5504M	80	1000	0.08-0.12	95
Seplife® LXPM CM706M	80	1000	0.26-0.30	105
Seplife® LXPM SP706M	80	1000	0.07-0.10	130
Seplife® LXPM DEAE706M	80	1000	0.09-0.13	100
Seplife® LXPM Q706M	80	1000	0.07-0.09	110

* Dynamic adsorption capacity test conditions: Lysozyme samples are used for cations, and BSA samples are used for anions.

- Ordering information

Product	Ref. No.	Pack Size
Seplife® LXPM CM650M	PM20224M1-1	25ml
	PM20224M1-2	100ml
	PM20224M1-3	500ml
	PM20224M1-4	1L
	PM20224M1-5	5L
	PM20224M1-6	10L
Seplife® LXPM SP650M	PM20124M1-1	25ml
	PM20124M1-2	100ml
	PM20124M1-3	500ml
	PM20124M1-4	1L
	PM20124M1-5	5L
	PM20124M1-6	10L
Seplife® LXPM DEAE650M	PM20424M1-1	25ml
	PM20424M1-2	100ml
	PM20424M1-3	500ml
	PM20424M1-4	1L
	PM20424M1-5	5L
	PM20424M1-6	10L
Seplife® LXPM Q650M	PM20324M1-1	25ml
	PM20324M1-2	100ml
	PM20324M11-3	500ml
	PM20324M1-4	1L
	PM20324M1-5	5L
	PM20324M1-6	10L

Product	Ref. No.	Pack Size
Seplife® LXPM CM5504S	PM50224S1-1	25ml
	PM50224S1-2	100ml
	PM50224S1-3	500ml
	PM50224S1-4	1L
	PM50224S1-5	5L
	PM50224S1-6	10L
Seplife® LXPM SP5504S	PM50124S1-1	25ml
	PM50124S1-2	100ml
	PM50124S1-3	500ml
	PM50124S1-4	1L
	PM50124S1-5	5L
	PM50124S1-6	10L
Seplife® LXPM DEAE5504S	PM50424S1-1	25ml
	PM50424S1-2	100ml
	PM50424S1-3	500ml
	PM50424S1-4	1L
	PM50424S1-5	5L
	PM50424S1-6	10L
Seplife® LXPM Q5504S	PM50324S1-1	25ml
	PM50324S1-2	100ml
	PM50324S1-3	500ml
	PM50324S1-4	1L
	PM50324S1-5	5L
	PM50324S1-6	10L

Product	Ref. No.	Pack Size
Seplife® LXPM CM5504M	PM50224M1-1	25ml
	PM50224M1-2	100ml
	PM50224M1-3	500ml
	PM50224M1-4	1L
	PM50224M1-5	5L
	PM50224M1-6	10L
Seplife® LXPM SP5504M	PM50124M1-1	25ml
	PM50124M1-2	100ml
	PM50124M1-3	500ml
	PM50124M1-4	1L
	PM50124M1-5	5L
	PM50124M1-6	10L
Seplife® LXPM DEAE5504M	PM50424M1-1	25ml
	PM50424M1-2	100ml
	PM50424M1-3	500ml
	PM50424M1-4	1L
	PM50424M1-5	5L
	PM50424M1-6	10L
Seplife® LXPM Q5504M	PM50324M1-1	25ml
	PM50324M1-2	100ml
	PM50324M1-3	500ml
	PM50324M1-4	1L
	PM50324M1-5	5L
	PM50324M1-6	10L

Product	Ref. No.	Pack Size
Seplife® LXPM CM 706M	PM10224M2-1	25ml
	PM10224M2-2	100ml
	PM10224M2-3	500ml
	PM10224M2-4	1L
	PM10224M2-5	5L
	PM10224M2-6	10L
Seplife® LXPM SP 706M	PM10124M2-1	25ml
	PM10124M2-2	100ml
	PM10124M2-3	500ml
	PM10124M2-4	1L
	PM10124M2-5	5L
	PM10124M2-6	10L
Seplife® LXPM DEAE 706M	PM10424M2-1	25ml
	PM10424M2-2	100ml
	PM10424M2-3	500ml
	PM10424M2-4	1L
	PM10424M2-5	5L
	PM10424M2-6	10L
Seplife® LXPM Q706M	PM10324M2-1	25ml
	PM10324M2-2	100ml
	PM10324M2-3	500ml
	PM10324M2-4	1L
	PM10324M2-5	5L
	PM10324M2-6	10L

Seplife® LXPM ultra-large-pore polymethacrylate IEX resins

In order to achieve rapid and efficient separation and purification of biological macromolecules (such as vaccines, virus-like particles, etc.), Sunresin has developed and produced ultra-large-pore chromatography resins specifically for virus products. The resins have a pore size of 300nm-500nm and is spherical.
The ultra-large pore size makes the mass transfer between biomacromolecules and the medium not limited by diffusion, and can achieve good separation of biomacromolecules at high flow rates while effectively maintaining the activity of biomacromolecules. Virus-specific chromatography resins have the advantages of high mechanical strength, acid and alkali resistance, and easy cleaning.

• Technical parameters

Product name	Seplife® LXPM400 Series
Matrix	Polymethylmethacrylate
Pore size (Å)	4000
Particle size (μm)	80
Flow rate range (cm/h)	120-300
Pressure resistance (MPa)	0.8
pH stability	2-13
Industrial processing	Capture, intermediate purification, fine purification
Main features	Super large pore size, strong hydrophilicity, high capacity, low non-specific adsorption, low back pressure
Main applications	Purification of virus particles and large molecular weight samples
Regeneration	0.5-2M NaCl solution
Cleaning	0.1-0.5M NaOH solution (or 50% ethanol)
Storage	20% ethanol at 4~35℃. For the chromatographic column that has been installed, it should be stored in buffer solution containing 20% ethanol (pH 7.0).

• Resin specifications

Reference	Particle size (μm)	Pore size (Å)	Exchange capacity (mmol/ml)	Dynamic loading capacity *(mg/ml)
Seplife® LXPM CM400M	80	4000	0.18-0.22	75
Seplife® LXPM SP400M	80	4000	0.06-0.10	75
Seplife® LXPM DEAE400M	80	4000	0.18-0.22	80
Seplife® LXPM Q400M	80	4000	0.10-0.14	180

- Ordering information

Products	Ref. No.	Pack Size
Seplife® LXPM CM400M	PM00225M2-1	25ml
	PM00225M2-2	100ml
	PM00225M2-3	500ml
	PM00225M2-4	1L
	PM00225M2-5	5L
	PM00225M2-6	10L
Seplife® LXPM SP400M	PM00125M2-1	25ml
	PM00125M2-2	100ml
	PM00125M2-3	500ml
	PM00125M2-4	1L
	PM00125M2-5	5L
	PM00125M2-6	10L
Seplife® LXPM DEAE400M	PM00425M2-1	25ml
	PM00425M2-2	100ml
	PM00425M2-3	500ml
	PM00425M2-4	1L
	PM00425M2-5	5L
	PM00425M2-6	10L
Seplife® LXPM Q400M	PM00325M2-1	25ml
	PM00325M2-2	100ml
	PM00325M2-3	500ml
	PM00325M2-4	1L
	PM00325M2-5	5L
	PM00325M2-6	10L

Hydrophobic Interaction Chromatography Resins (HIC)

Hydrophobic interaction chromatography (HIC) is based on the difference in the hydrophobic properties of the surface of biomolecules, and under different salt concentrations, the separation is achieved by the difference in the interaction with the hydrophobic groups of the HIC resins. Adsorbed under high salt conditions, when the salt concentration is reduced, different proteins are eluted in sequence from weak to strong hydrophobicity, so as to achieve the purpose of separation and purification.

Hydrophobic chromatography has the characteristics of mild operating conditions and high resolution, and is widely used in the separation and purification of biological macromolecules.

Sunresin's Seplife® LXPM hydrophobic chromatography resin is based on polymethacrylate as the matrix, after the surface is modified to be hydrophilic, it is connected with a long-chain hydrophilic group, and then coupled with a hydrophobic ligand, to have good bio-compatibility, high capacity, good chemical stability and high mechanical strength.

The Seplife® LXPM hydrophobic chromatography resins can be widely used in the downstream separation and purification of macromolecules such as antibodies, recombinant proteins, vaccines, peptides, and nucleic acids.

• Technical parameters

Product name	Seplife® LXPM Buty15504	Seplife® LXPM Pheny15504
Functional group	-Butyl	-Phenyl
Particle size (μm)	S:25-45; M:45-90	S:25-45; M:45-90
Pore size (Å)	1000	1000
Dynamic capacity (lysozyme, mg/ml)	S:≧25; M:≧20	S:≧25; M:≧20
Pressure resistance (bar)	8	8
Linear flow rate (cm/h)	100-800	100-800
pH stability	2-12	2-12
Storage and transport	4-30℃, 20% ethanol	4-35℃, 20% ethanol

• Ordering information

Product	Ref. No.	Pack Size
Seplife® LXPM-Butyl5504S	PM50624S1-1	25ml
	PM50624S1-2	100ml
	PM50624S1-3	500ml
	PM50624S1-4	1L
	PM50624S1-5	5L
	PM50624S1-6	10L
Seplife® LXPM-Butyl5504M	PM50624M1-1	25ml
	PM50624M1-2	100ml
	PM50624M1-3	500ml
	PM50624M1-4	1L
	PM50624M1-5	5L
	PM50624M1-6	10L

Product	Ref. No.	Pack Size
Seplife® LXPM-Phenyl5504S	PM50724S1-1	25ml
	PM50724S1-2	100ml
	PM50724S1-3	500ml
	PM50724S1-4	1L
	PM50724S1-5	5L
	PM50724S1-6	10L
Seplife® LXPM-Phenyl5504M	PM50724M1-1	25ml
	PM50724M1-2	100ml
	PM50724M1-3	500ml
	PM50724M1-4	1L
	PM50724M1-5	5L
	PM50724M1-6	10L

SEPLIFE

Gel Filtration Chromatography Resins (GF)

Seplife® Gel filtration chromatography resins are polyacrylamide-based beads independently developed by Sunresin. Through special crosslinking process and polymer bead preparation technology, a series of microspheres with different pore sizes are produced, which have uniform pore size distribution, high mechanical strength and good hydrophilicity. Seplife GF chromatography resins are widely used in the separation, purification and analysis of biological macromolecules.

• Technical parameters

Product	Particle size (μm)	Swelling (ml/g)	Flow rate (cm/h)	Molecular weight range (globulin Kd)
Seplife® Gel P–2M	45–90	3	5–10	100–1,800
Seplife® Gel P–2S	<45		<10	
Seplife® Gel P–4C	90–180	4	15–20	800–4,000
Seplife® Gel P–4M	45–90		10–15	
Seplife® Gel P–4S	<45		<10	
Seplife® Gel P–6C	90–180	6.5	15–20	1,000–6,000
Seplife® Gel P–6M	45–90		10–15	
Seplife® Gel P–6S	<45		<10	
Seplife® Gel P–10C	90–180	7.5	15–20	1,500–20,000
Seplife® Gel P–10M	45–90		10–15	
Seplife® Gel P–30C	90–180	9	7–13	2,400–40,000
Seplife® Gel P–30M	45–90		6–11	
Seplife® Gel P–60C	90–180	11	4–6	3,000–60,000
Seplife® Gel P–60M	45–90		3–5	
Seplife® Gel P–100C	90–180	12	4–6	5,000–100,000
Seplife® Gel P–100M	45–90		3–5	

*S:<45um, M:45-90um, C:90-180um
The pressure-resistant flow rate test uses a chromatographic column with a size of 16mm*400mm and a column height of 30cm.

• Ordering information

Product	Ref. No.	Pack Size
Seplife® Gel P–2M	PA00001M4-1	25ml
	PA00001M4-2	100ml
	PA00001M4-3	500ml
	PA00001M4-4	1L
	PA00001M4-5	5L
	PA00001M4-6	10L

Product	Ref. No.	Pack Size
Seplife® Gel P–2S	PA00001S4-1	25ml
	PA00001S4-2	100ml
	PA00001S4-3	500ml
	PA00001S4-4	1L
	PA00001S4-5	5L
	PA00001S4-6	10L

Product	Ref. No.	Pack Size
Seplife® Gel P–4C	PA00002C4-1	25ml
	PA00002C4-2	100ml
	PA00002C4-3	500ml
	PA00002C4-4	1L
	PA00002C4-5	5L
	PA00002C4-6	10L
Seplife® Gel P–4M	PA00002M4-1	25ml
	PA00002M4-2	100ml
	PA00002M4-3	500ml
	PA00002M4-4	1L
	PA00002M4-5	5L
	PA00002M4-6	10L
Seplife® Gel P–4S	PA00002S4-1	25ml
	PA00002S4-2	100ml
	PA00002S4-3	500ml
	PA00002S4-4	1L
	PA00002S4-5	5L
	PA00002S4-6	10L
Seplife® Gel P–6C	PA00011C4-1	25ml
	PA00011C4-2	100ml
	PA00011C4-3	500ml
	PA00011C4-4	1L
	PA00011C4-5	5L
	PA00011C4-6	10L

Product	Ref. No.	Pack Size
Seplife® Gel P–6M	PA00011M4-1	25ml
	PA00011M4-2	100ml
	PA00011M4-3	500ml
	PA00011M4-4	1L
	PA00011M4-5	5L
	PA00011M4-6	10L
Seplife® Gel P–6S	PA00011S4-1	25ml
	PA00011S4-2	100ml
	PA00011S4-3	500ml
	PA00011S4-4	1L
	PA00011S4-5	5L
	PA00011S4-6	10L
Seplife® Gel P–10C	PA00012C4-1	25ml
	PA00012C4-2	100ml
	PA00012C4-3	500ml
	PA00012C4-4	1L
	PA00012C4-5	5L
	PA00012C4-6	10L
Seplife® Gel P–10M	PA00012M4-1	25ml
	PA00012M4-2	100ml
	PA00012M4-3	500ml
	PA00012M4-4	1L
	PA00012M4-5	5L
	PA00012M4-6	10L

Product	Ref. No.	Pack Size
Seplife® Gel P–30C	PA30011C4-1	25ml
	PA30011C4-2	100ml
	PA30011C4-3	500ml
	PA30011C4-4	1L
	PA30011C4-5	5L
	PA30011C4-6	10L
Seplife® Gel P–30M	PA30011M4-1	25ml
	PA30011M4-2	100ml
	PA30011M4-3	500ml
	PA30011M4-4	1L
	PA30011M4-5	5L
	PA30011M4-6	10L
Seplife® Gel P–30S	PA30011S4-1	25ml
	PA30011S4-2	100ml
	PA30011S4-3	500ml
	PA30011S4-4	1L
	PA30011S4-5	5L
	PA30011S4-6	10L
Seplife® Gel P–60C	PA30012C4-1	25ml
	PA30012C4-2	100ml
	PA30012C4-3	500ml
	PA30012C4-4	1L
	PA30012C4-5	5L
	PA30012C4-6	10L

Product	Ref. No.	Pack Size
Seplife® Gel P–60M	PA30012M4-1	25ml
	PA30012M4-2	100ml
	PA30012M4-3	500ml
	PA30012M4-4	1L
	PA30012M4-5	5L
	PA30012M4-6	10L
Seplife® Gel P–100C	PA30022C4-1	25ml
	PA30022C4-2	100ml
	PA30022C4-3	500ml
	PA30022C4-4	1L
	PA30022C4-5	5L
	PA30022C4-6	10L
Seplife® Gel P–100M	PA30022M4-1	25ml
	PA30022M4-2	100ml
	PA30022M4-3	500ml
	PA30022M4-4	1L
	PA30022M4-5	5L
	PA30022M4-6	10L

Reversed-phase Chromatography Resins (RP)

Seplife® RP reversed-phase chromatography resins are polymer media with polysterene-DVB or polyacrylate as matrix and ester, butyl, phenyl, octadecyl or octadecyl as functional groups.

Seplife® RP reversed-phase chromatography resins have carbon chains of different lengths and polarities to provide Van der Waals force between the targets as the separation force. At the same time, the narrow pore size shields the influence of molecular size step by step, making the media more specific in the separation process. Under the condition that the molecular weight of the target substance is not greater than 2000Da, the separation of the target substance and impurities can be completed under the simple Van der Waals force.

Compared with traditional reversed-phase silica gel filtration resins, Seplife® RP reversed-phase chromatography media has the four following characteristics.

- Excellent chemical and physical stability

Traditional reversed-phase silica GF resins are not resistant to acids and alkalis, and have a narrow pH operating range. Seplife® RP reversed-phase chromatography media can be used for CIP/SIP with NaOH, can be directly sterilized by steam, and is stable to common organic solvents, so the media can be used in more batches, saving customers' investment.

- Unique selectivity

In most cases, Seplife® RP reversed-phase chromatography media can replace reversed-phase silica GF media for normal use, and the pH operating range is extended to 1-14, which increases the flexibility of customers' process development. Some structural analogues with very close retention times on reversed-phase silica GF media have very different chromatographic behaviors on Seplife® RP reversed-phase chromatography media, showing unique selectivity and strong separation ability.

- Higher capacity

Seplife® RP reversed-phase chromatography resins are porous polymers with a large specific surface area. Experiments have proved that Seplife® RP reversed-phase chromatography resins have a higher adsorption capacity than reversed-phase silica GF resins, further improve the user's production efficiency and reduce the production cost.

- Process scale-up

Sunresin has provided more than a hundred companies in China and around the world with chromatography materials used in the fields of food, medicine and biology. Resins produced with the Monojet technology have a narrower particle size range. The reproducibility during process scale-up is guaranteed. Its strong manufacturing capacity, strict QA system and understanding of pharmaceuticals and relevant laws and regulations in various countries eliminate customers' concerns about later-stage process amplification.

Seplife® Monojet Reversed Phase Chromatography Resins

• Properties of the resin

According to the difference of resin polarity, Sunresin provides 3 series of Monojet® resins. Each series offers particle size options of 10μm, 15μm or 30μm. For the LXMS series, two pore sizes of 100Å and 300Å are available. The specific properties of the resins are shown in the table below.

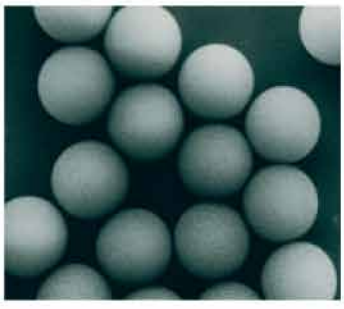
Product	Seplife® LXMS Series	Seplife® LXMM Series	Seplife® LXMSMA Series
Main Characteristics	Non-polar High pressure High capacity	Polar Medium pressure High capacity	Non-polar Medium pressure High capacity
Matrix	Polystyrene/dVB	PMMA	PDVB / SMA
Surface group	Phenyl	Ester	Phenyl / octadecyl
Particle size (μm)	10 / 15 / 30	15 / 30	30
Pore size (Å)	100 / 300	300	300
pH stability	1~14	1~14	1~14
Operating temperature℃	10~40	10~40	10~40
Dynamic capacity (mg/mL)	32-40mg (VB12)	6mg (VB12)	30-32mg (VB12)
	30~60 mg (IN)	33~40 mg (IN)	75~85 mg (IN)
Swelling coefficient	≦3% (10μM) Methanol ≦5% (15μM) Methanol ≦10% (30μM) Methanol	≦5% (15μM) Water ≦10% (15μM) Methanol ≦10% (30μM) Methanol	□ 10% (30μM) Methanol ≦10% (30μM) Methanol

• Applications

Seplife® RP series are direct polymerized high performance chromatography media. They can be used for reversed phase chromatography (RP) separation of small molecular compounds, polypeptides, low molecular weight proteins and other biomolecules. The resins can be preloaded into high-performance chromatographic columns for analytical, semi-preparative and preparative chromatographic separation of the above molecules.

• Pressure-Flow Characteristics

Seplife® Reversed Phase resins consist of uniform size particles with a diameter of 10, 15, 30 μm, spherical in shape, free from broken particles, super fine particles and fragments. This results in a stable, dense bed with good flow properties. Take the Seplife® RP LXMS-30(300) resin as an example (see Figure 2), the appearance of the resin is no different from that of the internationally famous brand.



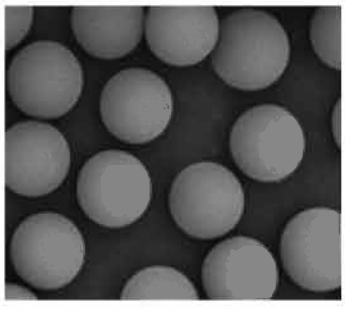


Figure 2 A: Seplife® RP LXMS-30 B: International competition

Due to the single-size beads, Seplife® RP resins have very low back pressure, and the actual value depends on the solvent used and the operating temperature. Take Seplife® RP LXMS-30 as an example, (as shown in Figure 3) at room temperature, the pressure / flow characteristics of Seplife® RP LXMS-30 and a well-known international competition brand in various organic solvents and water are shown. The pressure and flow rate data are measured in a 4.6mm*250mm column. It can be seen from the figure that Seplife® RP LXMS-30 has lower pressure and better linear relationship.

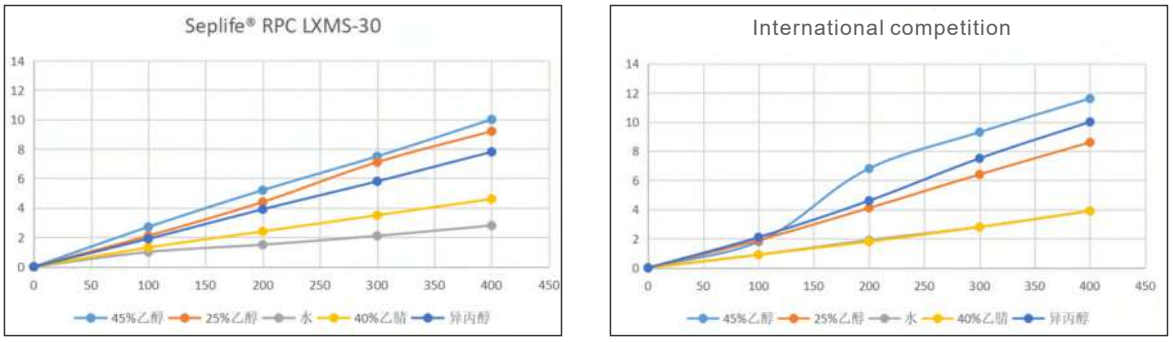


Figure 3 A: Pressure-flow rate curve of Seplife® RP LXMS-30(300) B: Pressure-flo rate curve of international competition

• Good separation performance at high flow rates and high capacities

Seplife® RP series resins have the characteristics of high flow rate and high dynamic capacity, which are very suitable for the application of fast and efficient chromatography. Also, the excellent resolution gives them better impurity removal ability than traditional ion exchange chromatography media in the stage of fine purification.

Using the small molecule theophylline to verify the chromatographic resolution, Figure 4 shows that Seplife® LXMS-30 (A) has excellent resolution as the international brand (B). Figure 5 and Figure 6 respectively show the separation effect profiles of Seplife® LXMS-30 (A) and the international competition (B) in separating standard proteins.

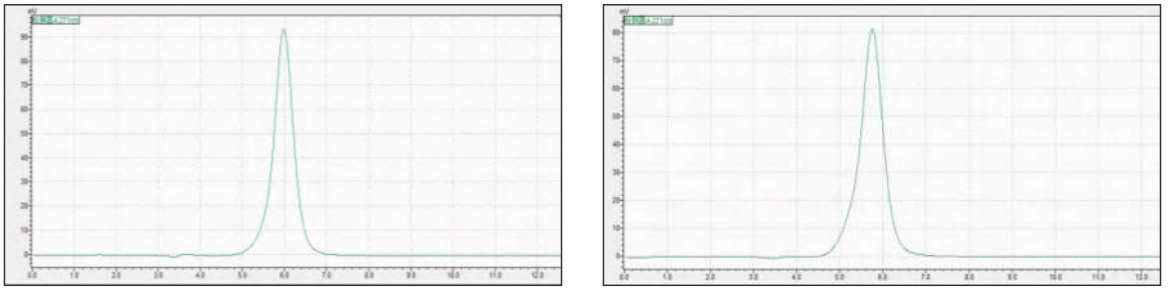


Figure 4 A: Separation spectrum of theophylline by Seplife® LXMS-30 B: Separation spectrum of theophylline by international competition

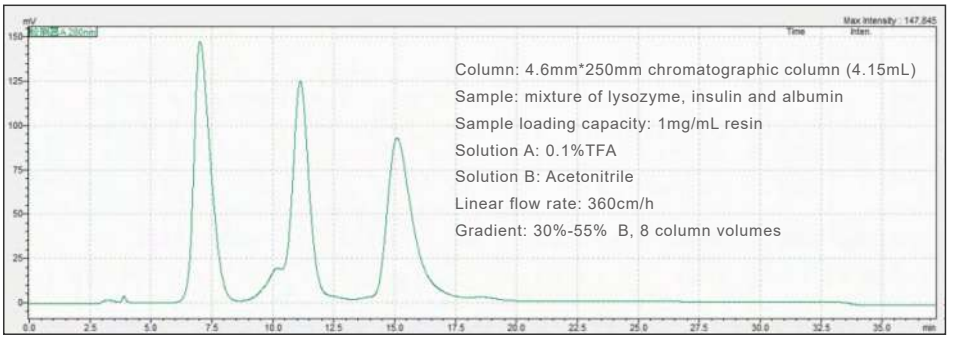


Figure 5: Separation spectrum of standard protein using Seplife® LXMS-30

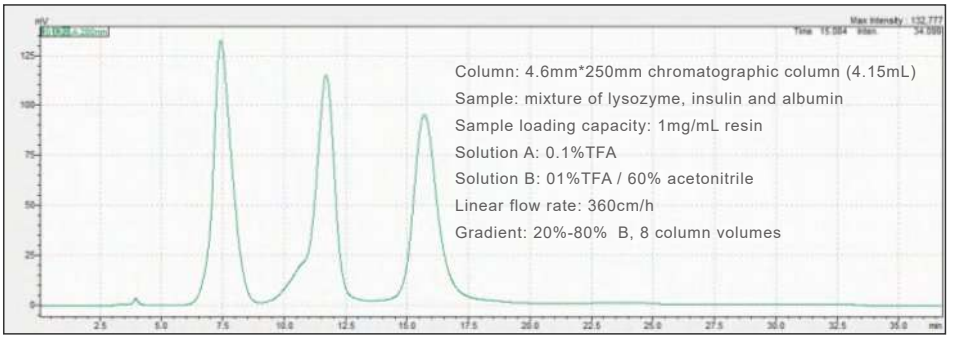


Figure 6: Separation spectrum of standard protein using international competition products

• High chemical stability

Seplife® RP is a polymer-based resin with high chemical stability offering flexibility in selecting operating conditions, as well as cleaning methods; The pH operating range and cleaning range is from pH 1 to 14.
From Figure 7, the separation effect of Seplife® RP LXMS-30 is not affected by the treatment after incubation in 1.0M NaOH or 1.0M HCl at 40°C for one week.

• Pressure-Flow Characteristics

The Seplife® RP resins consist of uniform size particles with a diameter of 10, 15, 30 μm, spherical in shape, and free from broken particles, fragments and fine particles. This results in a stable and dense bed with good flow properties.
Taking the Seplife® RP LXMS-30(300) resin as an example (see Figure 2A), the appearance of the resins is no different from that of the international competition.

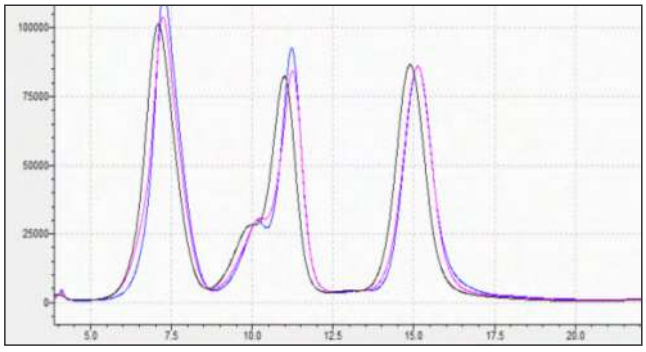


Figure 7 shows the Seplife® RP LXMS-30 separation of standard protein mixtures after treatment with 1.0 M HCl and 1.0M NaOH at 40°C respectively. The black curve is before treatment, the blue curve is after 1.0 M NaOH treatment for 30 days, and the pink curve is after 1.0 M HCl treatment for 30 days.

• Ordering information

Product	Matrix	Particle Size (μm)	Pore size (Å)	Pack size	Ref. No.
Seplife® RP LXMS-10 (100)	Polystyrene/DVB	10	100	25ml	PS00051X(10)2-1
				100ml	PS00051X(10)2-2
				500ml	PS00051X(10)2-3
				1L	PS00051X(10)2-4
				5L	PS00051X(10)2-5
				10L	PS00051X(10)2-6
Seplife® RP LXMS-10 (300)	Polystyrene/DVB	10	300	25ml	PS00042X(10)2-1
				100ml	PS00042X(10)2-2
				500ml	PS00042X(10)2-3
				1L	PS00042X(10)2-4
				5L	PS00042X(10)2-5
				10L	PS00042X(10)2-6
				Other size	PS00042X(10)2-R
Seplife® RP LXMS-15 (100)	Polystyrene/DVB	15	100	25ml	PS00051X(15)2-1
				100ml	PS00051X(15)2-2
				500ml	PS00051X(15)2-3
				1L	PS00051X(15)2-4
				5L	PS00051X(15)2-5
				10L	PS00051X(15)2-6
				Other size	PS00051X(15)2-R

Product	Matrix	Particle Size (μm)	Pore size (Å)	Pack size	Ref. No.
Seplife® RP LXMS-15 (300)	Polystyrene/DVB	15	300	25ml	PS00042X(15)2-1
				100ml	PS00042X(15)2-2
				500ml	PS00042X(15)2-3
				1L	PS00042X(15)2-4
				5L	PS00042X(15)2-5
				10L	PS00042X(15)2-6
				Other size	PS00042X(15)2-R
Seplife® RP LXMS-30 (100)	Polystyrene/DVB	30	100	25ml	PS00051X(30)2-1
				100ml	PS00051X(30)2-2
				500ml	PS00051X(30)2-3
				1L	PS00051X(30)2-4
				5L	PS00051X(30)2-5
				10L	PS00051X(30)2-6
				Other size	PS00051X(30)2-R
Seplife® RP LXMS-30 (300)	Polystyrene/DVB	30	300	25ml	PS00042X(30)2-1
				100ml	PS00042X(30)2-2
				500ml	PS00042X(30)2-3
				1L	PS00042X(30)2-4
				5L	PS00042X(30)2-5
				10L	PS00042X(30)2-6
				Other size	PS00042X(30)2-R
Seplife® RP LXMM-15 (300)	Polymethacrylate	15	300	25ml	PM00052X(15)2-1
				100ml	PM00052X(15)2-2
				500ml	PM00052X(15)2-3
				1L	PM00052X(15)2-4
				5L	PM00052X(15)2-5
				10L	PM00052X(15)2-6
				Other size	PM00052X(15)2-R
Seplife® RP LXMM-30 (300)	Polymethacrylate	30	300	25ml	PM00052X(30)2-1
				100ml	PM00052X(30)2-2
				500ml	PM00052X(30)2-3
				1L	PM00052X(30)2-4
				5L	PM00052X(30)2-5
				10L	PM00052X(30)2-6
				Other size	PM00052X(30)2-R
Seplife® RP LXMSMA-30 (300)	Polystyrene/DVB - Octadecyl Ester	30	300	25ml	PS00842X(30)2-1
				100ml	PS00842X(30)2-2
				500ml	PS00842X(30)2-3
				1L	PS00842X(30)2-4
				5L	PS00842X(30)2-5
				10L	PS00842X(30)2-6
				Other size	PS00842X(30)2-R

Seplife® Gaussian Distribution Reversed Phase Chromatography Resins

Seplife® RP LX-20SS and LX-16SS are chromatography resins obtained through direct polymerization. The polymer matrix with suitable pore size distribution provides excellent kinetic performance for the preparation and purification of small biomolecules. The resins provide balanced pressure-flow characteristics and good chromatographic separation capabilities, and can also be successfully applied to simulated moving bed (SMB) separation of various small biomolecules. These resins are often used together with bonded silica for industrial purification.

Seplife® RP LX-21SS is a special resin with divinylbenzene-styrene as the matrix and linear styrene as the functional group. Different from the reversed-phase resins produced through the traditional polystyrene-DVB copolymerization, the comb polymers produced by block polymerization are used as reversed-phase separation chromatography media, which greatly improve the interaction between the target substance and the resin itself. It has better chromatographic behavior for small hydrophilic molecules. Also, the narrow particle size distribution and good heat treatment process make the swelling capacity of the resins smaller, and the back pressure is lower at high flow rates, making it widely used in industrial-scale chromatographic purification.

Seplife® RP LX-24SS, LX-25SS, LX-26SS are chromatography resins with PDVB as matrix, methacrylase, C4, C18 linear alkanes as functional groups. Seplife® RP LX-55SS has methacrylate as the matrix. Together, they offer a separation option for the preparation and purification of small biomolecules that differs from polystyrene-divinylbenzene resins. Due to the different functional groups providing hydrophobic force, the chromatographic behavior of these resins is different from that of traditional polystyrene-DVB ones. Also, the polymerization method is used to obtain a resin containing functional groups, which has stronger alkali resistance than silica gel filtration resins. Soaking in 1M NaOH solution for 600 hours does not reduce the separation effect. The higher specific surface area compared to C18 silica resins also brings higher loading capacity. The narrow particle size distribution and good heat treatment process make the media less swellable and give lower back pressure at high flow rates, making it widely used in industrial-scale chromatographic purification.

- Technical parameters

Product name	Seplife® LX-16SS Series	Seplife® LX20SS Series	Seplife® LX21SS Series
Main features	Non-polar High pressure High capacity	Non-polar High pressure High capacity	Non-polar High pressure High capacity
Matrix	Polystyrene/DVB		
Surface group	Phenyl		
Particle size (μm)	S: 30-50μm; M:50-75μm; L:75-150μm		
Pore size (Å)	100	300	
pH stability	1~14		
Operating temperature	10-40℃		
Dynamic loading capacity (mg/mL)	40 mg(VB12)	32 mg(VB12)	42 mg(VB12)
	45mg (IN)	28mg (IN)	70mg (IN)
Swelling coefficiency	≤ 3% (S) Methanol ≤ 5% (M) Methanol ≤ 5% (L) Methanol	≤ 1.5% (S) Methanol ≤ 2.5% (M) Methanol ≤ 3% (L) Methanol	≤ 2% (S) Methanol ≤ 3% (M) Methanol ≤ 5% (L) Methanol

- Technical parameters (continued)

Product name	Seplife® LX-55SS Series	Seplife® LX24SS Series	Seplife® LX25SS Series	Seplife® LX26SS Series
Main features	Polar Mid-low pressure High capacity	Weak-polarity Mid pressure High capacity	Mid-polarity Mid pressure High capacity	Non-polar Mid pressure High capacity
Matrix	PMMA	PDVB/BA	PDVB/MMA	PDVB/SMA
Surface group	Ester	Phenyl / Butyl	Phenyl / Ester	Phenyl / octadecyl
Particle size (μm)	S:30-50μm; M:50-75μm; L:75-150μm			
Pore size (Å)	300			
pH stability	1~14			
Operating temperature	10~40			
Dynamic loading capacity (mg/mL)	6mg(VB12)	30mg(VB12)	20mg(VB12)	36mg(VB12)
	28mg (IN)	35mg (IN)	32mg (IN)	55mg (IN)
	≦10% (M) Methanol ≦15% (L) Methanol	≦5% (M) Methanol ≦10% (L) Methanol	≦5% (M) Methanol ≦10% (L) Methanol	≦7% (M) Methanol ≦12% (L) Methanol

- Ordering information

Product	Matrix	Particle Size (μm)	Pore size (Å)	Ref. No.
Seplife® RP LX-16SS(L)	Polystyrene/DVB	75-150	100	PS00051L2-R
Seplife® RP LX-16SS(M)	Polystyrene/DVB	50-75	100	PS00051M2-R
Seplife® RP LX-16SS(S)	Polystyrene/DVB	30-50	100	PS00051S2-R
Seplife® RP LX-20SS(L)	Polystyrene/DVB	75-150	300	PS00042L2-R
Seplife® RP LX-20SS(M)	Polystyrene/DVB	50-75	300	PS00042M2-R
Seplife® RP LX-20SS(S)	Polystyrene/DVB	30-50	300	PS00042S2-R
Seplife® RP LX-21SS(L)	Polystyrene/DVB	75-150	300	PS00052L2-R
Seplife® RP LX-21SS(M)	Polystyrene/DVB	50-75	300	PS00052M2-R
Seplife® RP LX-21SS(S)	Polystyrene/DVB	30-50	300	PS00052S2-R
Seplife® RP LX-55SS(L)	PMMA	75-150	300	PM00052L2-R
Seplife® RP LX-55SS(M)	PMMA	50-75	300	PM00052M2-R
Seplife® RP LX-55SS(S)	PMMA	30-50	300	PM00052S2-R
Seplife® RP LX-24SS(L)	PDVB/BA	75-150	300	PS00642L2-R
Seplife® RP LX-24SS(M)	PDVB/BA	50-75	300	PS00642M2-R
Seplife® RP LX-24SS(S)	PDVB/BA	30-50	300	PS00642S2-R
Seplife® RP LX-25SS(L)	PDVB/MMA	75-150	300	PM00752L2-R
Seplife® RP LX-25SS(M)	PDVB/MMA	50-75	300	PM00752M2-R
Seplife® RP LX-25SS(S)	PDVB/MMA	30-50	300	PM00752S2-R
Seplife® RP LX-26SS(L)	PDVB/SMA	75-150	300	PS00842L2-R
Seplife® RP LX-26SS(M)	PDVB/SMA	50-75	300	PS00842M2-R
Seplife® RP LX-26SS(S)	PDVB/SMA	30-50	300	PS00842S2-R

Annexe-Purification operation method for ion exchange chromatography

• Column packing

The concentration of the homogenate refers to the ratio of the volume of the chromatographic media to the total volume of the homogenate when they reach a constant volume. In order to obtain the best packing effect of ion exchange chromatography media, we recommend 0.5M NaCl to equilibrate overnight, and then use 0.5M NaCl solution for homogenization. The concentration of homogenate is 65-70%. The specific packing method is as follows,

(1) First calculate the volume Vc of the installed chromatographic column, Vc=Ac x L, AC=r2. (Vc: column volume, AC: chromatographic cross-sectional area L: column height; r: column radius.)

(2) Gently stir the ion-exchange chromatography media in the original container to completely disperse it in the liquid to form a homogenate. Measure the weight or volume of the stock solution required. Under normal circumstances, the ion exchange chromatography media will be compacted under pressure and cause volume shrinkage. In order to obtain a compact column bed, it is recommended that the volume of the media be excessive, generally about 1.2 times the column volume.

(3) Pour out the 20% ethanol preservation solution in the media, replace the 20% ethanol with 0.5M NaCl solution, and equilibrate overnight.

(4) Before loading the column, use 0.5M NaCl solution to adjust the concentration of the homogenate to 65-70%. Pour the homogenate into the chromatography column at one time, and mark the height after sedimentation and equilibrium.

(5) Install the distributor, adjust the height so that the compression coefficient is 1.05~1.10; then start the infusion pump, and use 1.5-2 times the working flow rate to stabilize the column bed (1-2 column volume).

(6) Test the column efficiency and symmetry according to SOP and make sure to meet the predetermined standards.

• Evaluation of column efficiency

The installed column should be equilibrated with 2BV 0.5M NaCl solution. Then 2.0M NaCl should be used to test the column efficiency at a flow rate of 100cm. The specific test parameters are detailed in the table below.

Sample: 2M NaCl solution

Loading volume: 1~5% column volume

Eluent: 0.5M NaCl solution

Linear flow rate: 100cm/h

Testing: UV @280nm, 2M NaCl Loading: conductivity detector

• Cleaning

The packed column should be cleaned with at least 5BV of deionized water.

• Balancing

Equilibrate the column with an equilibration buffer above 5BV until the conductivity and pH of the effluent remain unchanged (consistent with the equilibrium solution). The buffer can be Buffer A, such as 20 mM PBS, pH7.0. The specific buffer system should be screened and optimized according to the stability and isoelectric point of the target protein, and the type of ion exchange media.

• Sample loading

Solid samples can be prepared by dissolving in equilibrium solution. Low concentration sample solution can be dialyzed in balance solution; high concentration sample solution can be diluted by balance solution. In order to avoid clogging the chromatography column, the sample should be centrifuged or membrane filtered. The amount of feed is calculated according to the loading capacity of the chromatography media and the content of the target protein in the feed solution. Before loading the sample, ensure that the sample buffer should be as consistent as possible with the equilibrium solution.

• Elution

After the sample is loaded, continue to rinse with the equilibrium buffer until the baseline is stable. According to the actual situation, the method of increasing the salt concentration or changing the pH of the mobile phase can be used to elute the samples adsorbed on the chromatography media in sequence.

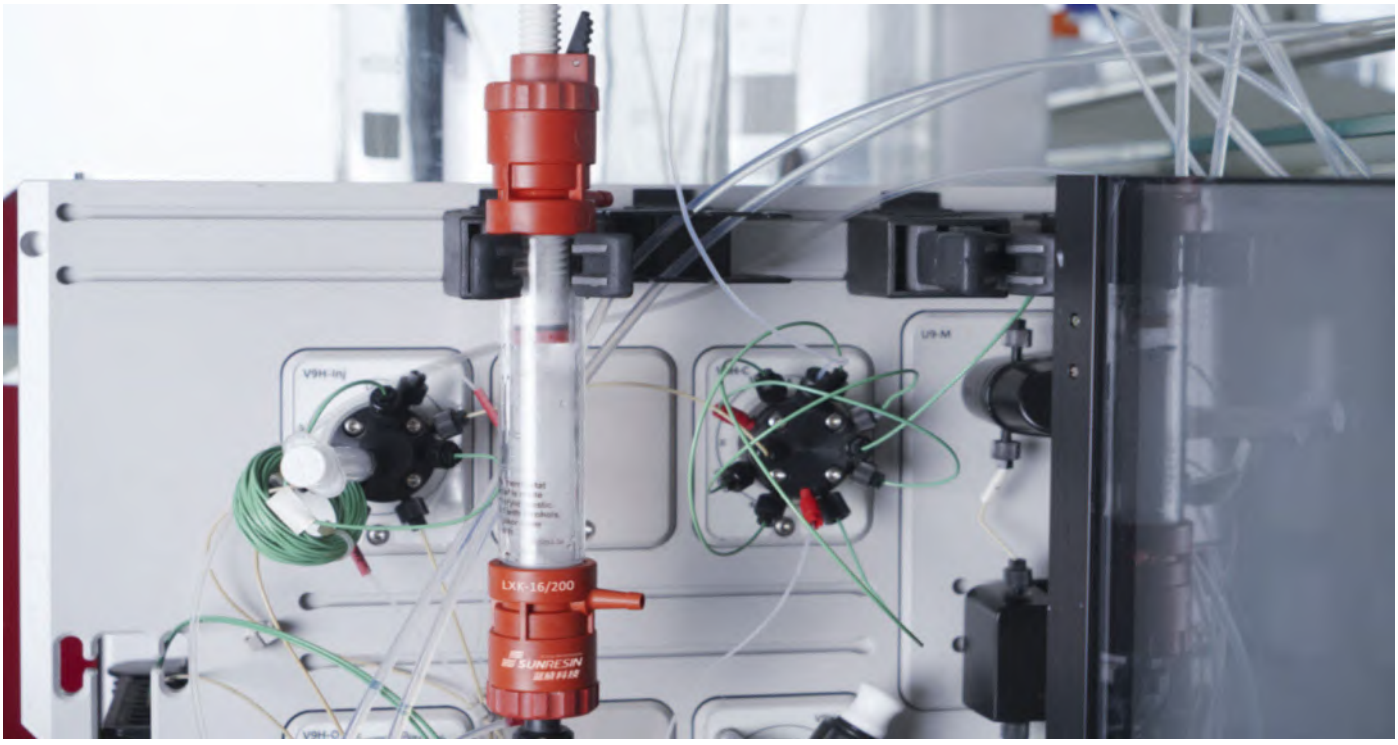
• Regeneration

After each chromatography operation, the column can be washed with 0.5-2M NaCl to remove proteins strongly bound to the chromatography media.

• Cleaning in Place (CIP)

In order to maintain the performance of the chromatography column, if there are proteins or other impurities that cannot be effectively removed during the regeneration process, a cleaning-in-place step can be performed. When cleaning in place, the method of reverse flushing can be used, and the specific operation steps are as follows:

(1) For proteins that are too strongly bound by ionic bonds, wash with 2M NaCl above 3BV, and wash with deionized water above 3BV.
(2) For precipitated proteins, hydrophobically bound proteins or lipoproteins, wash with 0.2-0.5 M NaOH (1-2 hours in contact with the chromatography media), and wash with 5BV or more of equilibrium solution and 3BV or more of deionized water ;
(3) For proteins, lipoproteins and lipids with strong hydrophobic binding, they can be washed with 50% ethanol or 30% isopropanol above 5 BV (the contact time with the chromatography media is 0.5-1 hour). Then wash with more than 5 BV of deionized water. They can also be cleaned with alkaline or acidic solution containing non-ionic surfactant, such as 0.1-0.5% Triton X-100+0.1M acetic acid for 1-2 hours, and rinse with more than 5BV of 50% ethanol to remove the detergent , and then rinse with more than 5BV of pure water. When using high-concentration organic solvents, in order to avoid bubbles, the method of gradually increasing the concentration of organic solvents should be adopted.



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