



Tofflon-Qianchun Bio-separation Resins Product Introduction

PROFESSIONAL SUPPLIER OF BIOSEPARATION RESIN



Tofflon Qianchun Biotechnology Co. LTD
东富龙千纯生物科技(上海)有限公司





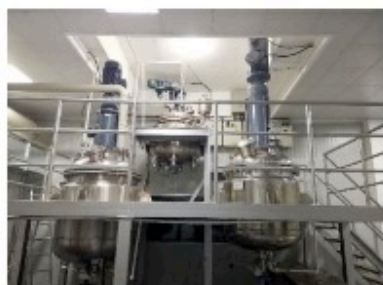
PART 1

Company





R&D Laboratory



Production Facility



Shanghai Site

(More than 30,000m², will be completed in 2024)

Current capacity: 500L per batch
10000L per year

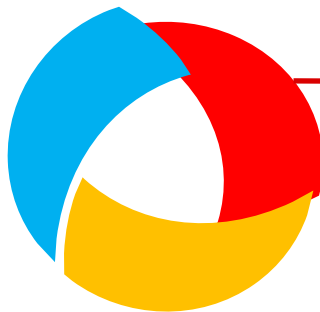


Future capacity: 5000L per batch
200000L per year

1 Business Scope

1. Bioseparation Resins

More than 200 mature and stable standardized products, with predictable fast delivery and responsive technical services



2. Service for purification technology

A complete set of purification process development (process exploration, process amplification, equipment selection) for industrial scale

3. Customization

Customized products according to special purpose

层析类型

凝胶过滤层析 gel filtration chromatography

离子交换层析 Ion-exchange chromatography

疏水作用层析 Hydrophobic Interaction chromatography

亲和层析 Affinity chromatography

混合模式层析 Mixed Mode chromatography

产品类型

凝胶过滤介质 (填料)

离子交换介质 (填料)

疏水介质 (填料)

亲和介质 (填料)

混合模式介质 (填料)

预活化介质 (填料)

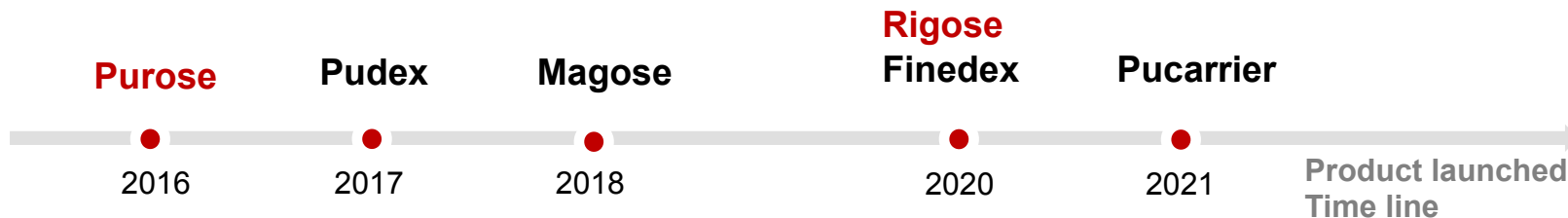
其他微球产品



PART 2

Product Introduction

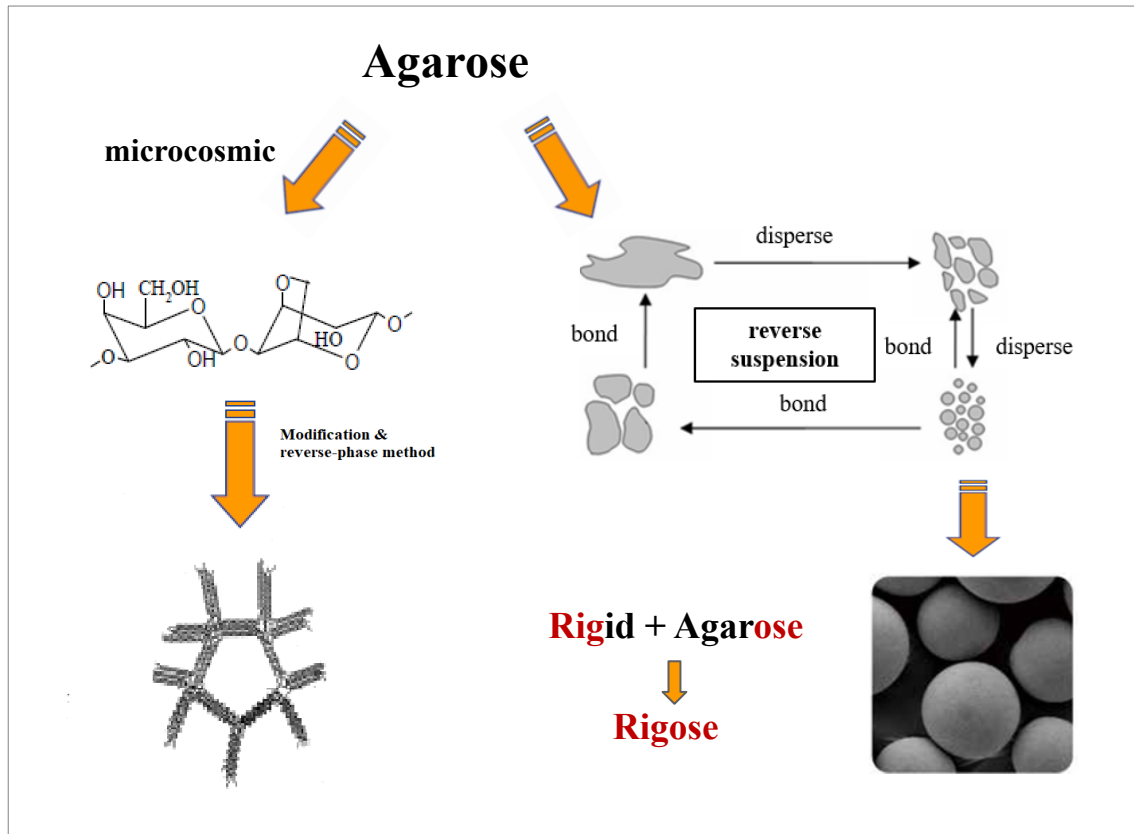




Tofflon Qianchun	Contrast to Cytiva	Product Positioning	Application
Purose	Sepharose	Agarose chromatography media	GFC, IEX, AC, HIC, Preactivated media
Rigose	Capto	A new generation of highly rigid agarose media	IEX, AC, HIC, MMC, Preactivated media
Pudex	Sephadex	Classical dextran gel filtration medium	GFC, IEX
Finedex	Superdex	A new generation gel filtration media composed of agarose and dextran	GFC
Magose	Mag Sepharose	Agarose magnetic bead chromatography media	IEX, AC, Preactivated media
Pucarrier	Cytodex	Dextran spherical microcarrier	Animal (adherent) cell culture

2.1 Rigose

Rigose serie resins are the second generation of Qianchun Bio chromatography media based on High Flow agarose which leads to a rigid structure



Agarose:

- Hydrophilic;
- Biocompatible;
- Low non-specific adsorption.



Rigose:

- Low back pressure;
- Excellent flow properties;
- High binding capacity;
- High resolution.

2.1 Rigose

IEX

Rigose IEX

- Rigose DEAE
- Rigose Q
- Rigose SP

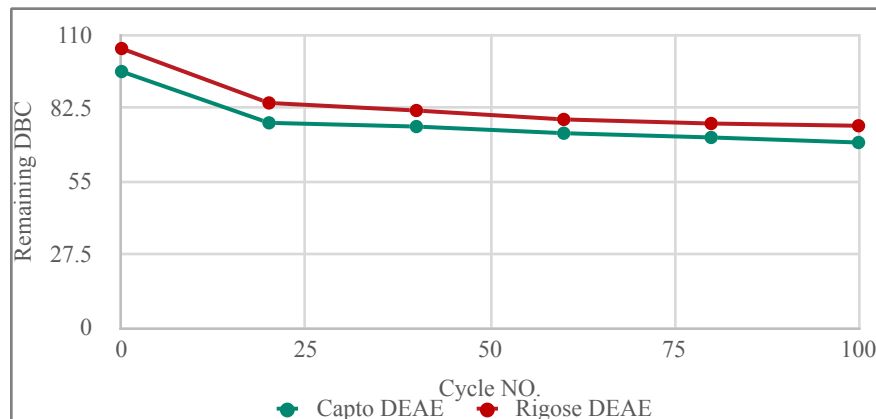
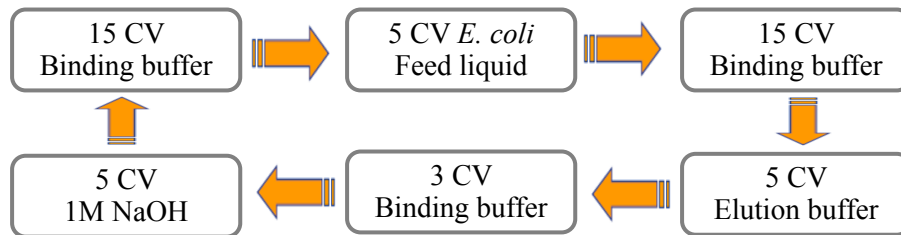
Riose IEX High Resolution

- Rigose DEAE HiRes
- Rigose Q HiRes
- Rigose SP HiRes
- Rigose CM HiRes

Rigose IEX Plus

- Rigose SP Plus

Test Data of Rigose DEAE



AC

For Tag Protein Purification

- Rigose Ni-IDA
- Rigose Ni-NTA
- Rigose Ni-TED
- Rigose Ni
- Rigose GSH

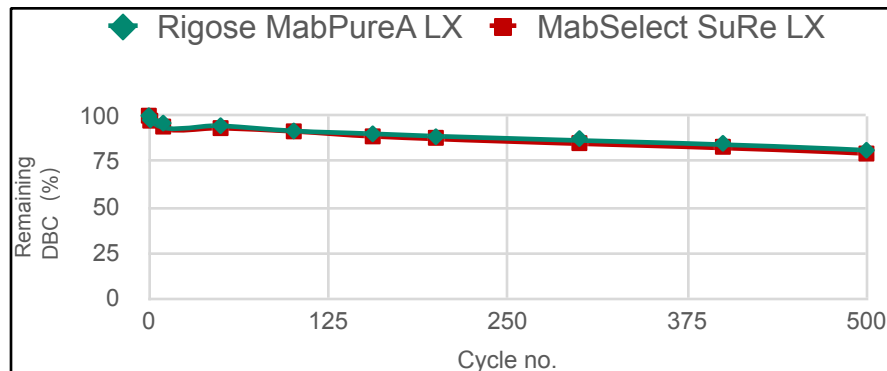
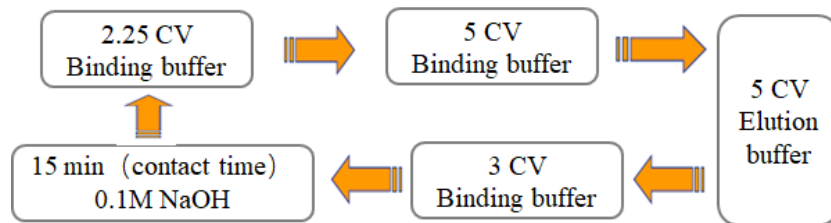
For Tag Protein Purification

- Rigose MabPureA
- Rigose MabPureA LX
- Rigose iProtein L

Other AC Media

- Rigose Blue(RB5)
- Rigose Heparin
- Rigose Benzamidine
- Rigose PlasmidPure

Test Data of Rigose MabPureA LX



HIC

Rigose HIC

- Rigose Butyl
- Rigose Phenyl (HS)
- Rigose Octyl

Rigose HIC High Resolution

- Rigose Butyl HiRes
- Rigose Phenyl HiRes
- Rigose Octyl HiRes

MMC

Multimodal Rigose

- Rigose MMA
- Rigose MMC

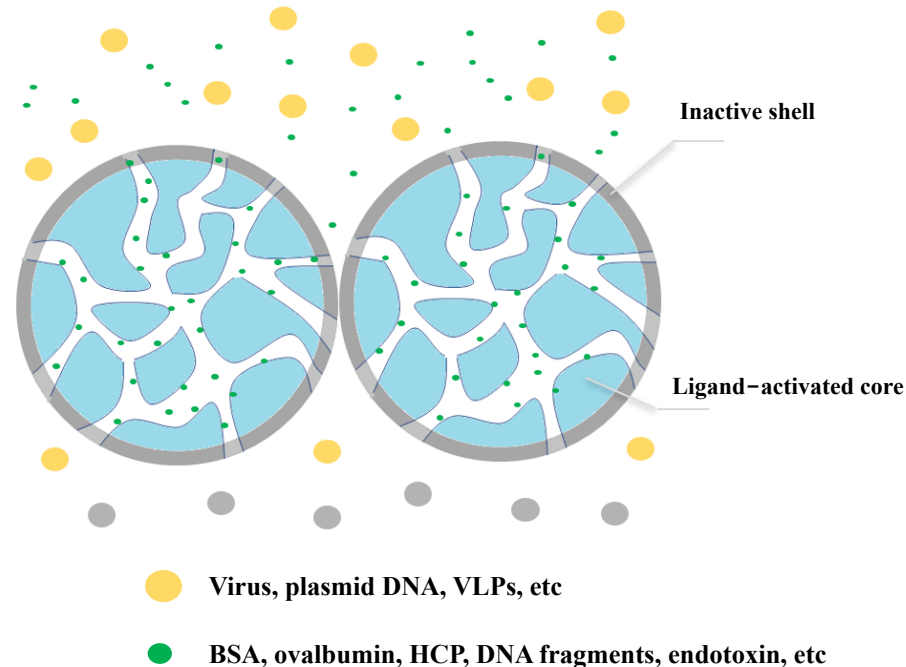
Multimodal Rigose High Resolution

- Rigose MMA HiRes
- Rigose MMC HiRes

Rigose Shell

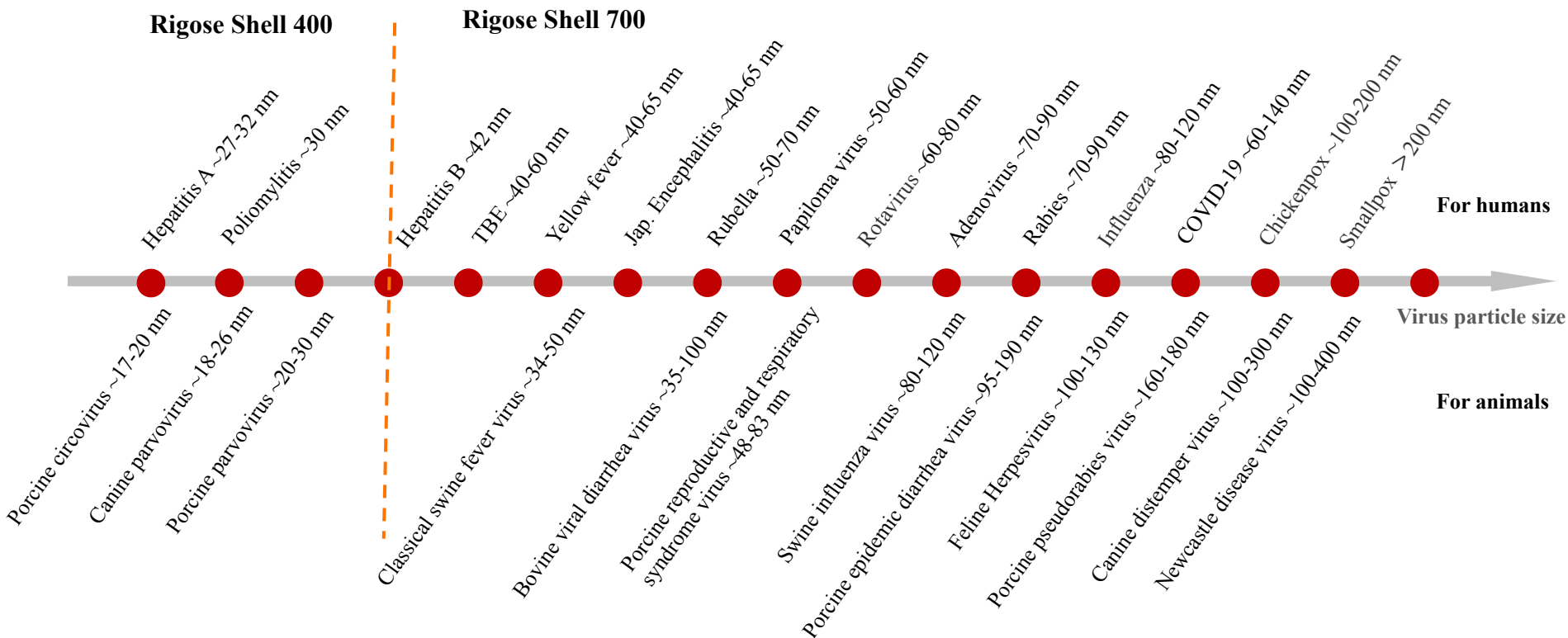
- Rigose Shell 700
- Rigose Shell 400

Rigose Shell



2.1 Rigose

Rigose Shell: Meet the purification requirements of numerous virus particles



Purose series resins are porous agarose particles based on highly cross-linked agarose, which retains the excellent hydrophilicity and large grid structure of natural polysaccharide compounds.

Key Feature:

- Good compatibility with bioactive macromolecules;
- High applicability;
- Low non-specific adsorption.



GFC

Purose Fast Flow

- Purose 4 FF
- Purose 6 FF

IEX

IEX Purose Fast Flow

- Q Purose 6 FF
- DEAE Purose 6 FF
- SP Purose 6 FF
- CM Purose 6 FF

IEX Purose Big Beads

- Q Purose 6 BB
- DEAE Purose 6 BB
- SP Purose 6 BB
- CM Purose 6 BB

IEX Purose High Performance

- Q Purose 6 HP
- DEAE Purose 6 HP
- SP Purose 6 HP
- CM Purose 6 HP

IEX Purose XL

- Q Purose 6 XL
- DEAE Purose 6 XL
- SP Purose 6 XL

AC

For Antibody Purification

iProtein Purose Fast Flow

- iProtein A Purose 4 FF
- iProtein G Purose 4 FF
- iProtein L Purose 4 FF

For Tag Protein Purification

Ni- Purose Fast Flow

- Ni-IDA Purose 6 FF
- Ni-NTA Purose 6 FF
- Ni-TED Purose 6 FF
- Ni Purose 6 FF

Ni- Purose High Performance

- Ni-IDA Purose 6 HP
- Ni-NTA Purose 6 HP
- Ni-TED Purose 6 HP
- Ni Purose 6 HP

GSH Purose Fast Flow

- GSH Purose 6 FF

Other AC Media

AC Purose Fast Flow

- Blue Purose 6 FF
- Heparin Purose 6 FF
- Benzamidine Purose 4 FF (HS)
- Benzamidine Purose 4 FF (LS)
- IgG Purose 4 FF

AC Purose High Performance

- Blue Purose 6 HP
- Heparin Purose 6 HP

Purose Endotoxin-Removal

- Purose Endotoxin-Removal

HIC

HIC Purose Fast Flow (High Sub / Low Sub)

- Butyl Purose 4 FF
- Phenyl Purose 6 FF (HS)
- Phenyl Purose 6 FF (LS)
- Octyl Purose 4 FF

HIC Purose High Performance

- Butyl Purose 6 HP
- Phenyl Purose 6 HP
- Octyl Purose 6 HP

Preactivated Media

Preactivated Purose Fast Flow

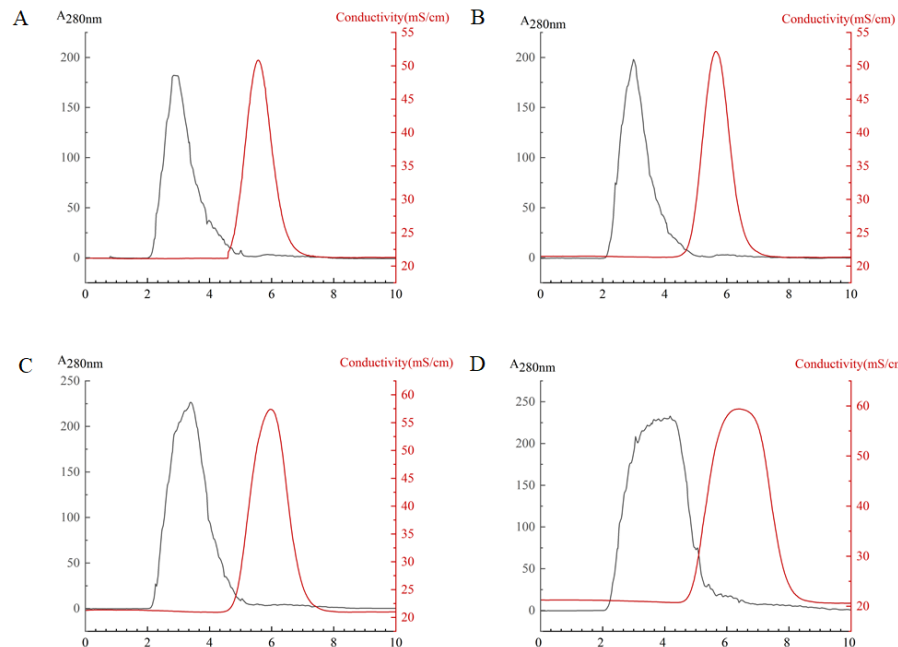
- Epoxy Purose 4 FF
- NHS Purose 4 FF
- EAH Purose 4 FF
- ECH Purose 4 FF
- Bromohydrin Purose 4 FF
- SulfoLink Purose 4 FF

Pudex series resins are made by cross-linked dextran with epichlorohydrin which is commonly used in separation of biomolecules and relatively small molecules.

Key Feature:

- Low non-specific adsorption.
- High chemical stability
- Multiple separation ranges and particle sizes are available

Column: PrePack Desalting Column 5 mL
 Sample: BSA (2 mg/mL), 0.5 M NaCl
 Sample Volume: 0.8 (A), 1.3 (B), 1.7 (C), 2.2 (D) mL (16-44%CV)
 Buffer: 0.15 M NaCl



GFC

For Desalting or Buffer Exchange

- Pudex G-10
- Pudex G-15
- Pudex G-25 Coarse
- Pudex G-25 Medium
- Pudex G-25 Fine
- Pudex G-25 Superfine
- Pudex G-50 Coarse
- Pudex G-50 Medium
- Pudex G-50 Fine
- Pudex G-50 Superfine

IEX

IEX Pudex

- DEAE Pudex A-25
- DEAE Pudex A-50
- Q Pudex A-25
- Q Pudex A-50
- CM Pudex C-25
- CM Pudex C-50
- SP Pudex C-25
- SP Pudex C-50

Finedex Key Feature:

Qianchun's new generation size exclusion medium which is composed of dextran and agarose:

- Stable in a variety of physical and chemical conditions;
- Outstanding selectivity and high resolution for the separation of proteins and peptides;
- Low nonspecific interaction and high recovery;
- Rapid and high-resolution separation applications from laboratory to process scale.

Finedex	Fractionation Range(Mr)	
	Dextran	Globular proteins
Finedex 30 pg	-	$\sim < 10^4$
Finedex 75 pg	$\sim 500 - 3 \times 10^3$	$\sim 3 \times 10^3 - 7 \times 10^4$
Finedex 200 pg	$\sim 1 \times 10^3 - 1 \times 10^5$	$\sim 1 \times 10^4 - 6 \times 10^5$

Magose series media is a high-throughput magnetic bead for purification based on cross-linked agarose supplemented with Fe_3O_4 .

IEX

Magose IEX

- Magose DEAE
- Magose Q
- Magose SP
- Magose CM

AC

For Tag Protein Purification

- Magose Ni-IDA
- Magose Ni-NTA
- Magose Ni-TED
- Magose Ni
- Magose GSH

For Tag Protein Purification

- Magose iProtein A
- Magose iProtein G
- Magose iProtein L

Other AC Media

- Magose Heparin

HIC

Magose HIC

- Magose Butyl
- Magose Phenyl
- Magose Octyl

Preactivated Media

Magose

- Magose Bromohydrin
- Magose NHS

Pucarrier 1 Key Feature:

- Increase the production of cell fermentation;
- Easy to separate and remove impurities such as cells and cell fragments from the final fermentation broth;
- Easy to control and operate;
- Reduce costs in cell culture applications.

Code NO.	Product	Pack Size	Matrix	Particle Size Distribution (μm)	Ligand Density (mM/g)	Approx. area (wet) (cm^3/g)	Swelling Factor (cm^3/g)	Temperature (pH 7.0 water)	Approx. Number Of Dry Micro-carriers/g
L851-28	Pucarrier 1	100 g	Cross-linked dextran matrix with DEAE groups	100-250 (Wet)	1.4-1.6	3000	~20	115°C ,20min	4×10^6
L851-23		200 g							
L851-29		500 g							
L851-30		1 kg							
L851-41		5 kg							
L851-42		10 kg							
L851-43		25 kg							

Specification

HiTrap	5×1 mL kit
	5×5 mL kit
	1 mL kit
	5 mL kit
HiScreen	5 mL (8/100)
HiPrep	20 mL (16/100)
	40 mL (16/200)



2.8 QCXKC Columns





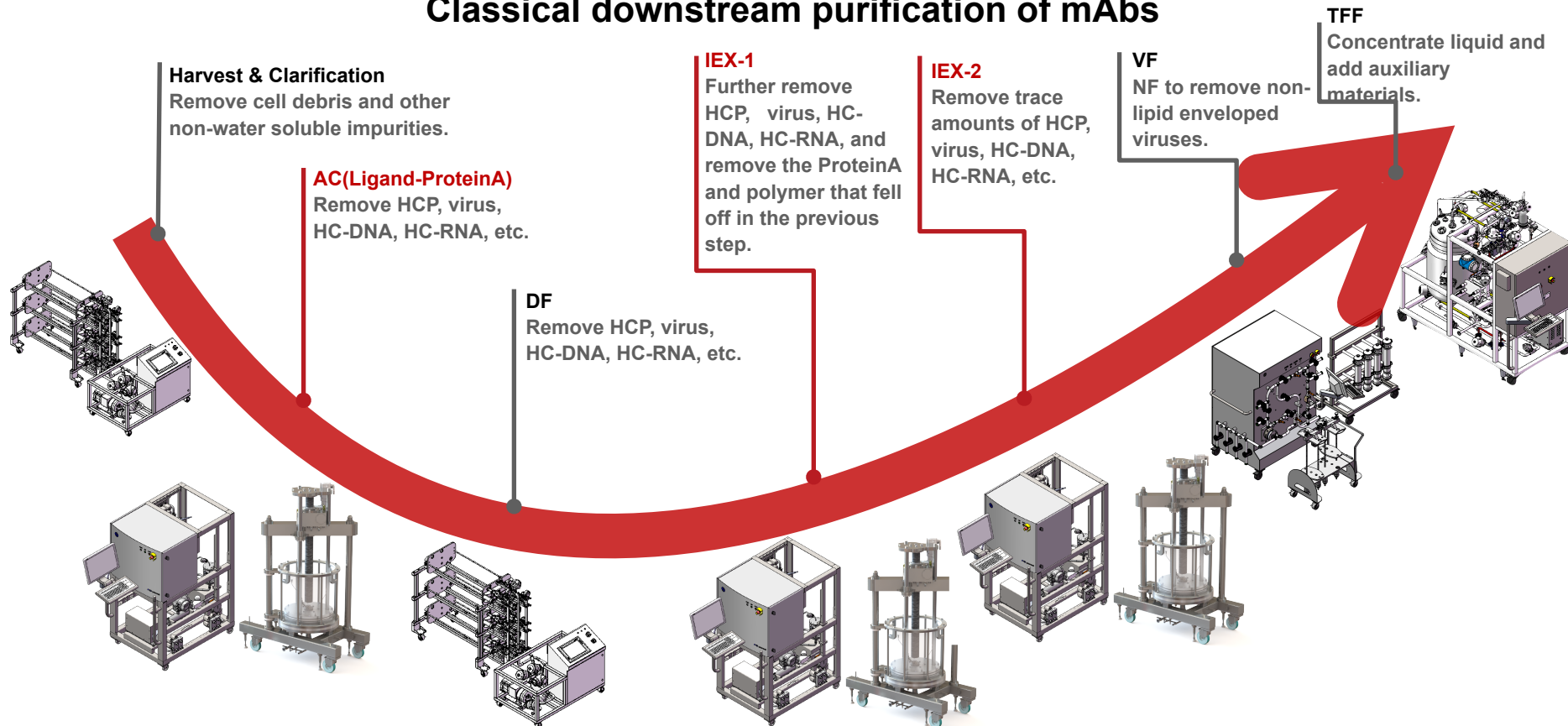
PART 3

Product Application



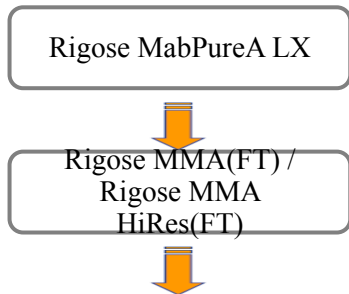
3.1 Application in Antibody

Classical downstream purification of mAbs

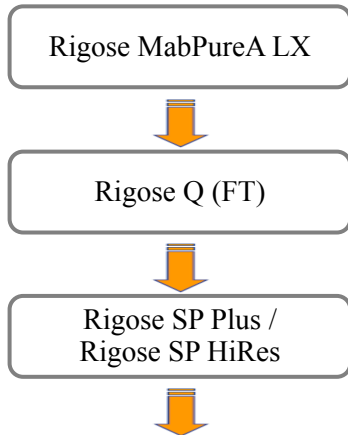


Recommended purification process of mAbs:

Two steps

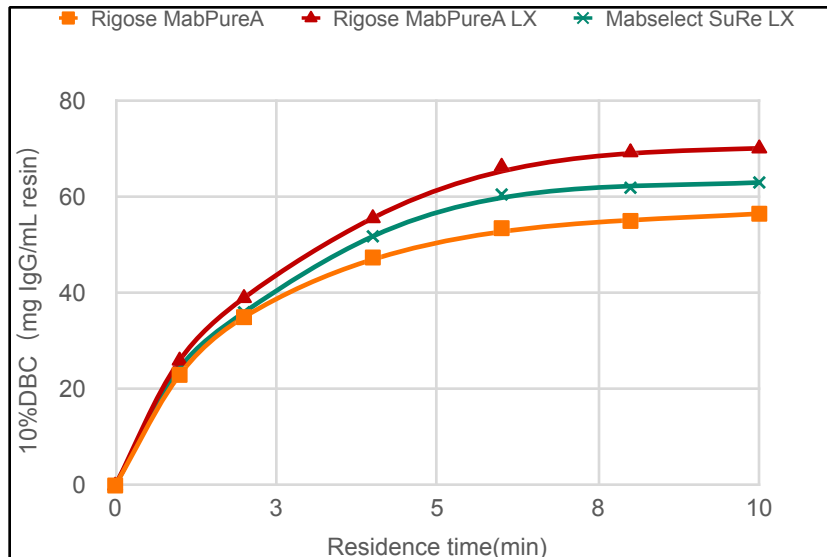


Three steps

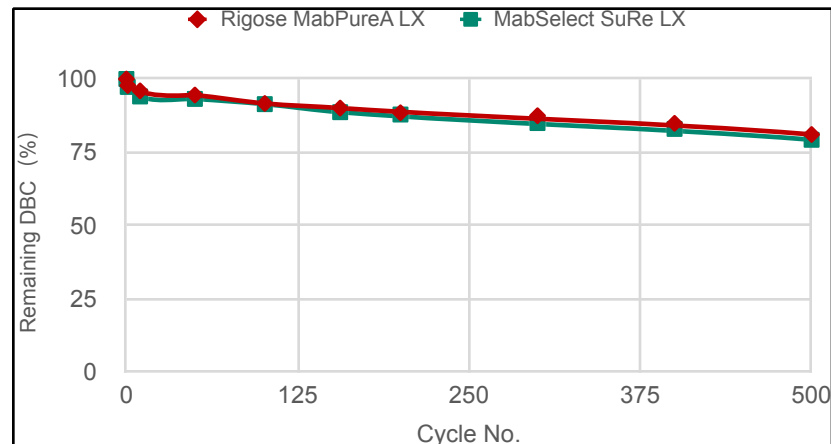
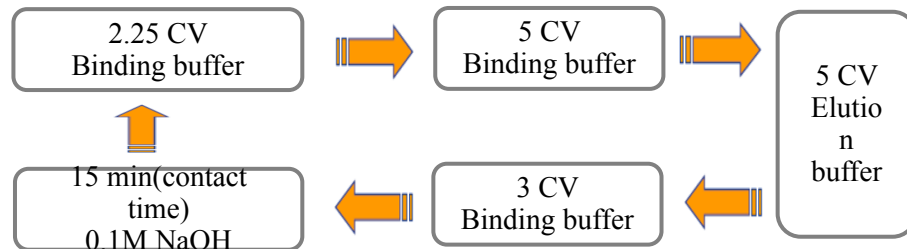


Products	Particle Size (μm)	DBC(/mL)	Maximal Pressure(MPa)	Maximal Flow Rate(MPa)
- New generation antibody purification media - Tolerance 0.1-0.5 M sodium hydroxide inline cleaning - Suitable for industrial production				
Rigose MabPureA LX	85	~60 mg IgG	0.5	500
- The anionic mixing mode, which tolerates the combination of ionic and hydrophobic interactions between samples and media under high salt conditions, provides customers with a different resolution option from traditional media - Fine purification such as antibody or recombinant protein is preferred - Fast flow rate - High resolution				
Rigose MMA	75	35 mg BSA	0.5	600
Rigose MMA HiRes	40	45-85 mg IgG	0.5	300
- Rigid agarose matrix with higher flow rate and lower backpressure than traditional ion exchange media. - Faster mass transfer and high dynamic binding load - High resolution - High physicochemical stability, can still maintain high dynamic binding load after hundreds of CIP cycles - Widely used, suitable for moderate and fine purification				
Rigose SP Plus	50	100 mg IgG	0.5	400
Rigose SP HiRes	40	70 mg lysozyme	0.5	300
Rigose Q	90	100 mg BSA	0.5	700

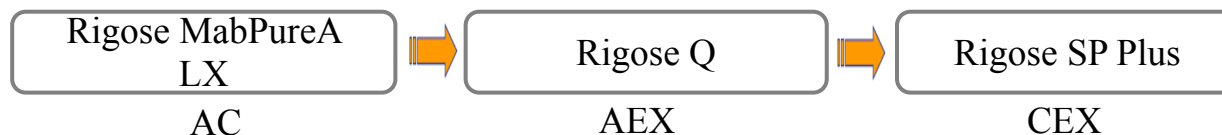
Capacity of Protein A Resins



Alkali-resistant of Rigose MabPureA LX



Example of 3 steps purification:

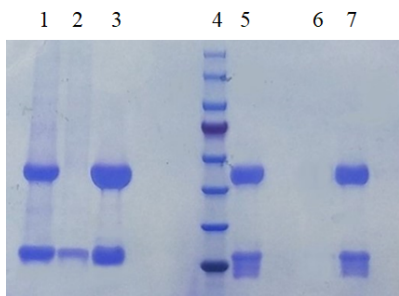
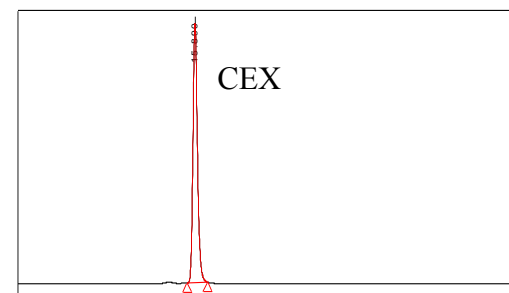
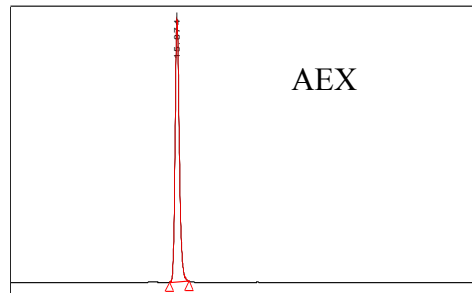
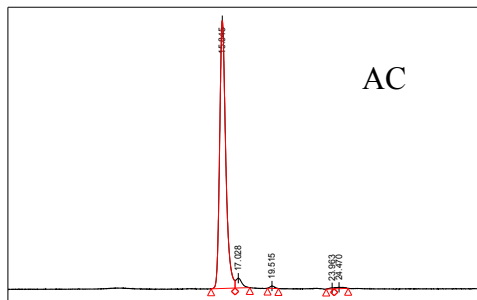


Rigose MabPureA LX

Rigose Q

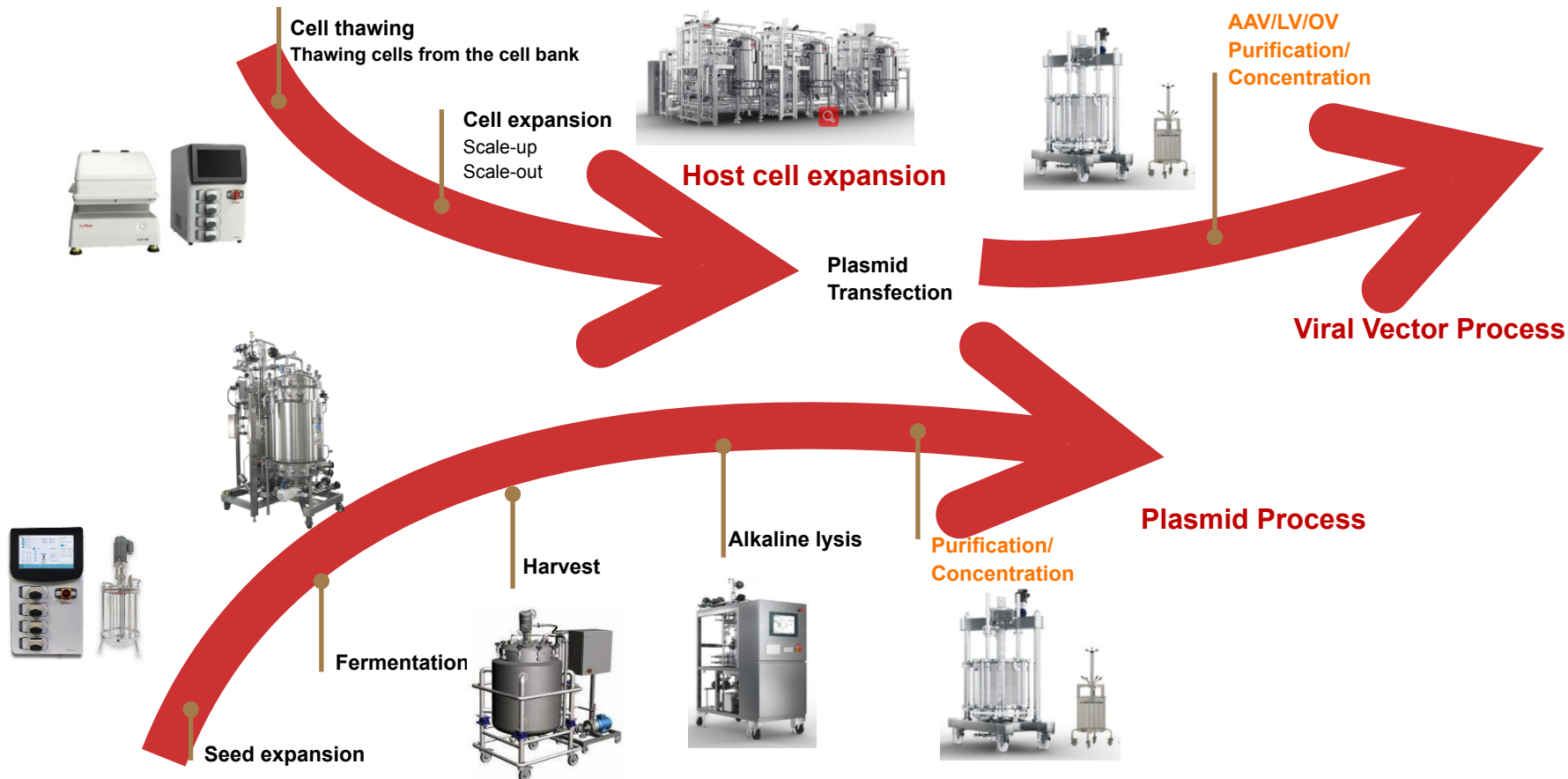
Rigose SP Plus

Example of 3 steps purification:

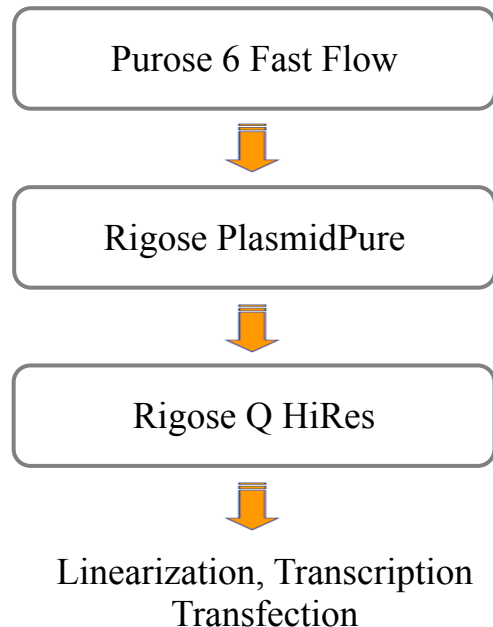


- 1: Sample
- 2: Flowthrough fraction, Rigose MabPureA LX
- 3: Eluate, Rigose MabPure A LX
- 4: Marker
- 5: Flowthrough fraction, Rigose Q
- 6: Flowthrough fraction, Rigose SP Plus
- 7: Eluate, Rigose SP Plus

	AC	AEX	CEX
	Rigose MabPureA LX	Rigose Q	Rigose SP Plus
Recovery(%)	98.55	92.47	95.36
SEC-HPLC Purity(%)	95.76	100	100
HCP residual (ppm)	115.498	36.45	13.3
Protein A residual (ppm)	0.025	0.093	0.043
Endotoxin residual (EU/mL)	0.068	0.049	0.034



Recommended purification process of plasmid



Products	Particle Size (μm)	DBC(/mL)	Maximal Pressure(MPa)	Maximal Flow Rate(MPa)
- Highly cross-linked agarose, good flow properties - Low unspecific adsorption, high recovery - Stable in all common aqueous solution, 8 M urea, 6 M guanidine hydrochloride, 70% ethanol and 1-2 M NaOH for CIP				
Purose 6 FF	45-165	/	0.3	600
- For plasmid DNA purification - Excellent choice for process scale				
Rigose PlasmidPure	36-44	≥3mg	0.5	500
- Rigid agarose matrix with higher flow rate and lower backpressure than traditional ion exchange media. - Faster mass transfer and high dynamic binding load - High resolution - High physicochemical stability, can still maintain high dynamic binding load after hundreds of CIP cycles - Widely used, suitable for moderate and fine purification				
Rigose Q HiRes	40	55 mg BSA	0.5	500

Step 1 GFC - Purose FF

Experiment condition:

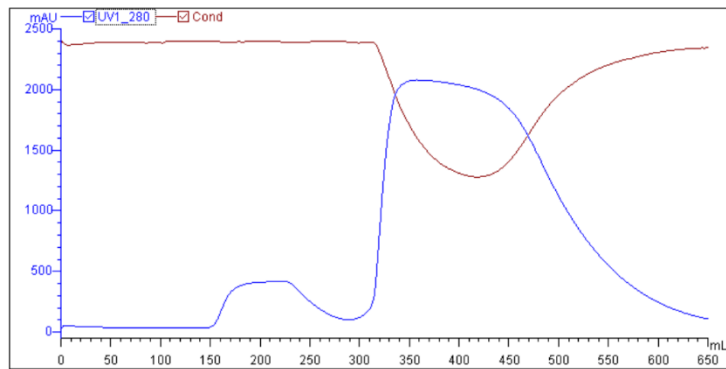
Plasmid: pUC57

Sample: Clarified alkaline lysate

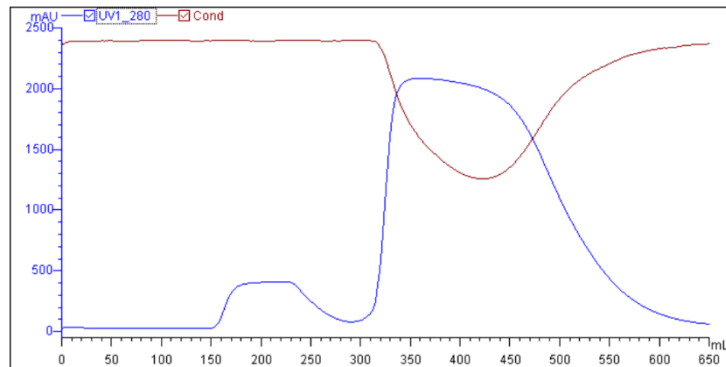
Sample load: 0.3 CV

Column: Purose 6 FF, 20 cm

Buffer: 2.1 M $(\text{NH}_4)_2\text{SO}_4$,
10 mM EDTA,
100 mM Tris-HCl, pH 7.5

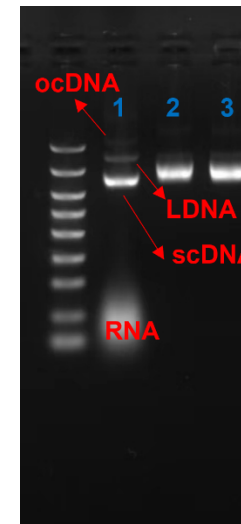


Purose 6 FF



Sepharose 6 FF

Agarose electrophoresis



1. Alkaline lysate (20×)
2. pDNA after Purose 6FF
3. pDNA after Sepharose 6FF

Step 2

AC - Rigose PlasmidPure

Experiment condition:

Sample: Plasmid DNA after group separation

Sample load: 3 mg

Column: Rigose PlasmidPure, 1mL

Binding buffer: 2 M $(\text{NH}_4)_2\text{SO}_4$,

10 mM EDTA,

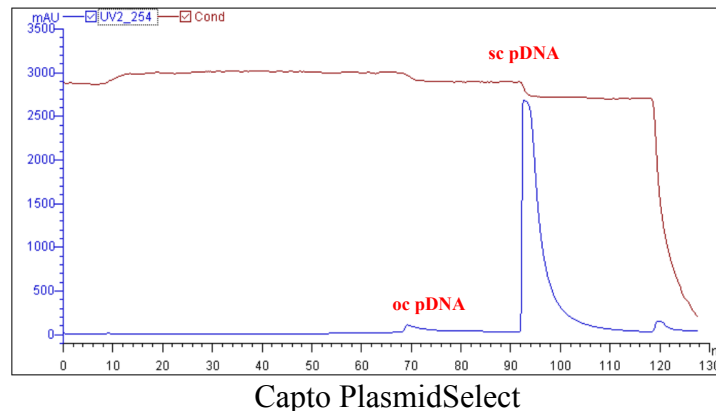
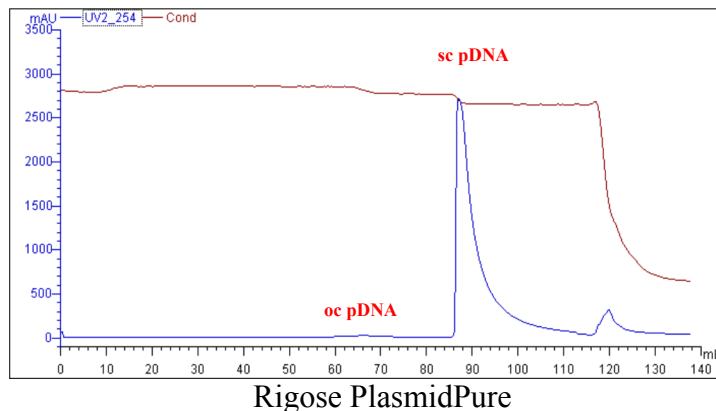
100 mM Tris-HCl, pH 7.5

Elution buffer: 0.3 M NaCl,

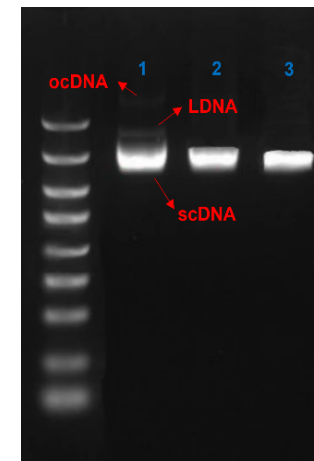
1.7 M $(\text{NH}_4)_2\text{SO}_4$,

10 mM EDTA,

100 mM Tris-HCl, pH 7.5



Agarose electrophoresis



1. pDNA after Purose 6FF
2. Elute of Rigose PlasmidPure
3. Elute of Capto PlasmidSelect

Step 3 IEX - Rigose Q HiRes

Experiment condition:

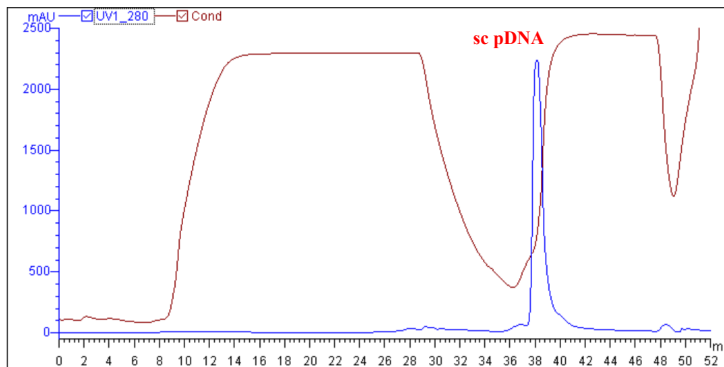
Sample: Supercoiled plasmid DNA
from PlasmidPure (1: 2)

Sample load: 2.0 mg

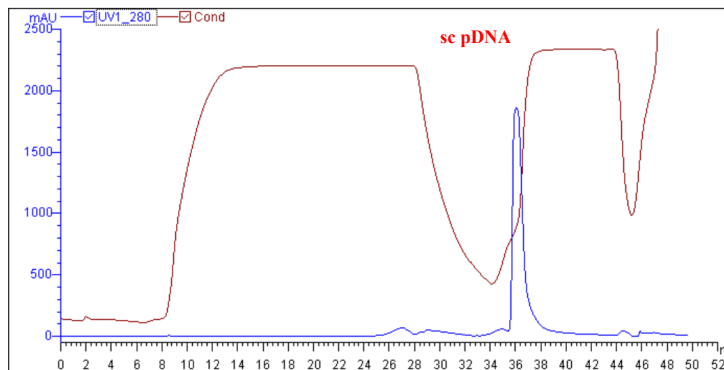
Column: Rigose Q Hires, 1mL

Binding buffer: 0.4 M NaCl,
10 mM EDTA,
100 mM Tris-HCl, pH 7.5

Elution buffer: 1 M NaCl,
10 mM EDTA,
100 mM Tris-HCl, pH 7.5



Rigose Q HiRes



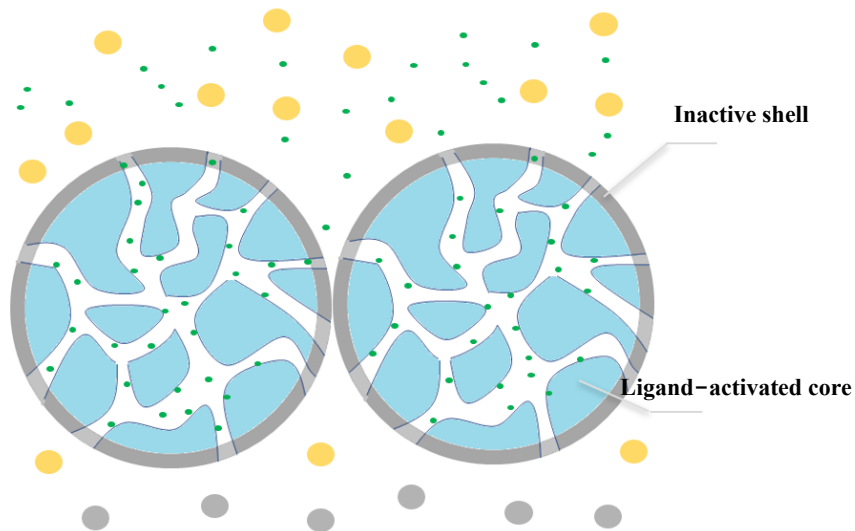
Capto Q ImPres

Agarose electrophoresis



1. Elute of Rigose Q Hires
2. Elute of Capto Q Impres

Rigose Shell



● Virus, plasmid DNA, VLPs, etc

● BSA, ovalbumin, HCP, DNA fragments, endotoxin, etc

Rigose Shell 400
For 20-35 nm



For **AAV** Purification

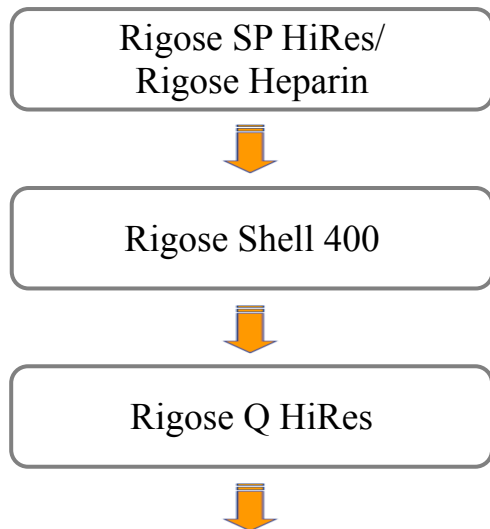
Rigose Shell 700
For Larger than 35nm



For **LV** or **OV** Purification

Products	Particle Size (μm)	DBC(/mL)	Maximal Pressure(MPa)	Maximal Flow Rate(MPa)
• Unique bead structure, composed of inactive shell and ligand-activated core • Average cut offs: ~ Mr 400 000 for Rigose Shell 400, ~Mr 700 000 for Rigose Shell 700 • High binding capacity, up to 100-fold higher sample load than traditional GFC • Significantly higher flow rate than traditional GFC • Reduce equipment, site, buffer, time and labor costs compare with traditional GFC • Suitable for process scale				
Rigose Shell 400	90	25 mg BSA	0.5	700
Rigose Shell 700	85	15 mg BSA	0.5	500

Classical adeno-associated virus (AAV) purification process

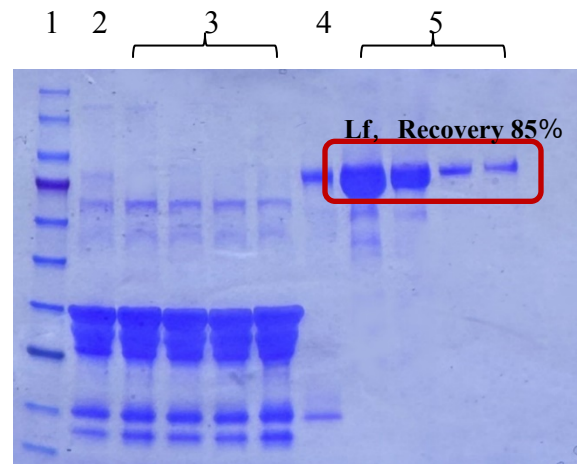


Products	Particle Size (μm)	DBC(/mL)	Maximal Pressure(MPa)	Maximal Flow Rate(MPa)
- Unique microsphere structure with inert "shell" and activated "core" - The interception molecular weight > 400 kDa - High binding capacity, up to 100 times the processing capacity of the traditional gel filtration process, and maintain high purity - High flow rate - Compared with the traditional gel filtration process, it can save the cost of equipment, site, buffer, time and labor - Highly suitable for industrial production, more suitable for the production and use of animal biological drugs (suitable for the purification of virus particles with a diameter of 20-35 nm)				
Rigose Shell 400	90	≥25 mg BSA	0.5	700
- High resolution - High flow rate - Widely used, suitable for moderate and fine purification				
Rigose SP HiRes	40	70 mg lysozyme	0.5	300
Rigose Q HiRes	40	55 mg BSA	0.5	300
Rigose Heparin	75	1.4mg antithrombin III	0.5	600

- Column: **SP Purose 6BB in QCXKC 16/300**
- Sample: **Skimmed milk (200 CV)**
- Binding buffer: **20mM PB, PH 6.8**
- Washing buffer: **20mM PB, 0.4 M NaCl, PH 6.8**
- Elution buffer: **20mM PB, 0.8 M NaCl, PH 6.8**
- Flow rate: **600 cm/h**

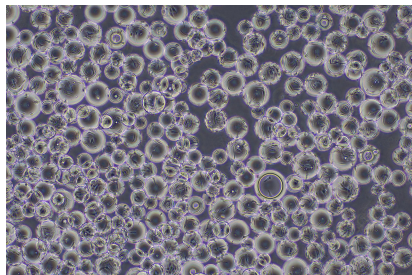
Products	Particle Size (μm)	DBC (/mL)	Maximal Pressure (M Pa)	Maximal Flow Rate (cm/h)
SP Purose 6 BB	100-300	110 mg lysozyme	0.3	1800

- High resolution
- High flow rate
- Widely used, suitable for moderate and fine purification

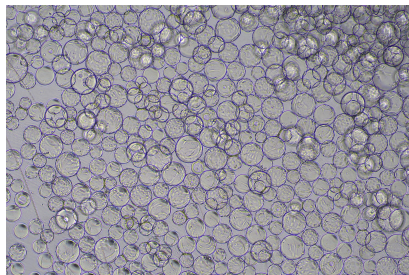


1. Marker
2. Sample
3. Flowthrough fraction
4. Wash
5. Elution

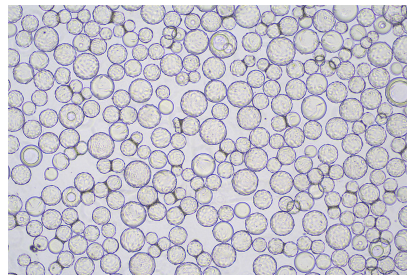
Yield: generally 70-80 mg LF / 1L fresh milk



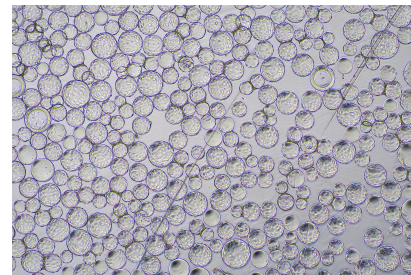
Day1



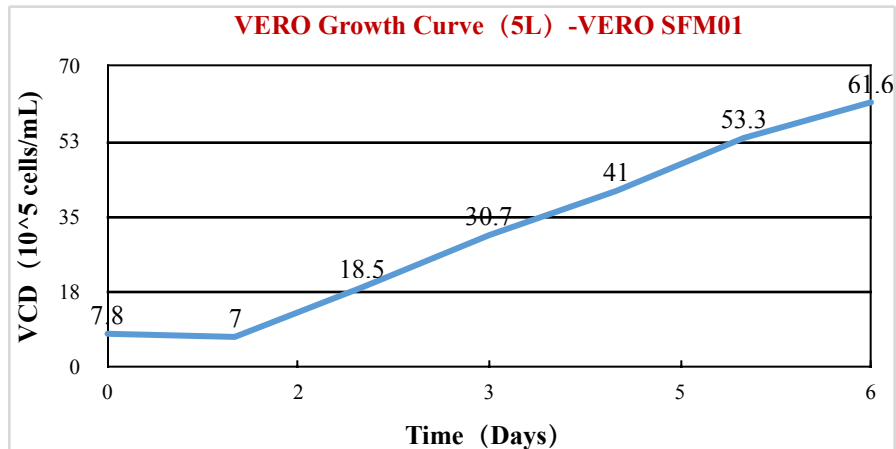
Day3



Day5



Day6



Medium	VERO SFM01
Carrier Model	Pucarrier 1
Culture Volume	2L
Carrier Concentration	10g/L
Seeded Cells	1.55*10 ⁹

Data from the Tofflon laboratory