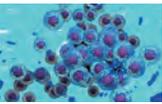
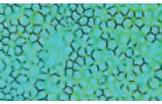


Custom Service
**Recombinant Protein &
Antibody Production**

 **Sino Biological**

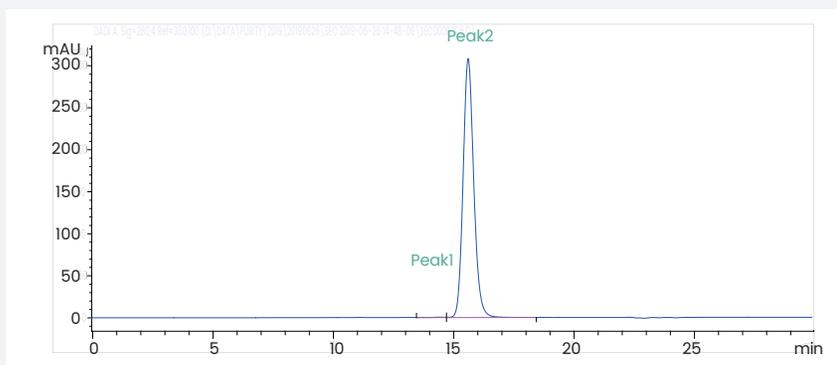
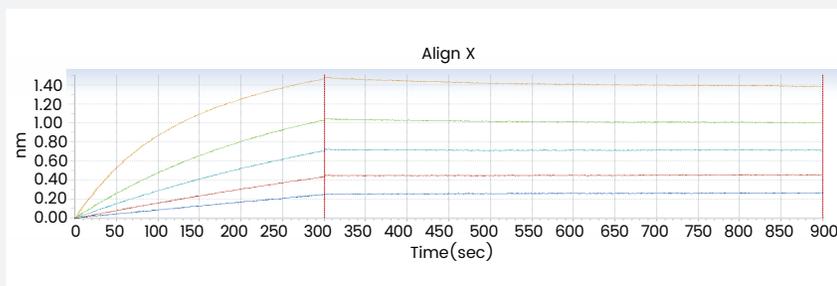
Recombinant Protein Expression Services

Sino Biological offers comprehensive solutions for recombinant protein expression. We will customize our service based on your specific need. We will take care of everything from study design, codon optimization, gene synthesis, transfection, purification, to document preparation. The available platforms are summarized below:

Expression System	Time Line	Notes	Examples
 Mammalian	6-8 weeks	<ul style="list-style-type: none"> High density cell culture High expression level Specially optimized vectors A collection of proprietary lead sequences and linkers Secreted proteins and ECD 	IL2 CLEC12A EGFRVIII DLL4 DKK1
 Insect	8-10 weeks	<ul style="list-style-type: none"> High success rate Usually used for large proteins and intracellular proteins Glycosylation Sf9 cells and High-five cells available 	Influenza HA NKG2D CD39 AG02
 <i>E.coli</i>	6-8 weeks	<ul style="list-style-type: none"> Rapid Most cost-effective Extensive experience in purification from the inclusion body Endotoxin ctrl available upon request 	IL18 IL7 IL1-Beta PflDH

Quality Control

The protein expression service program is supported by Sino Biological's QC group, which employs a variety of state-of-the-art platforms including HPLC, FACS, BiaCore, Octet, among others. The quality of the final products will be evaluated based on your request. All data will be included in the COA.



Recombinant Antibody Expression Services

Sino Biological's core strength is its in-house developed mammalian cell culture and recombinant expression platforms. The platform employs several proprietary reagents that are specially optimized to enhance the expression level of recombinant antibodies in 293 and CHO cells. The company provide a variety of packages for customers who need antibody expression services.



Expression System	Time Line	Notes
SinoExpress HTP mAb expression service (mAb only)	3 weeks*	<ul style="list-style-type: none"> • 0.1–5mg mAb production • >95% purity • Endotoxin ctrl upon request • A minimum of 5 constructs required
Sino Transient Expression Services (mAb and other antibody-like constructs known to have comparable expression level)	4–10 weeks	<ul style="list-style-type: none"> • 5mg-gram level • 95% by SEC • <1EU/mg guaranteed • Conjugation service available upon request
Sino Customized Expression Services (heavily engineered mAb, Bi-specific, ScFv, and other modified antibody-like constructs)	6–8 weeks	<ul style="list-style-type: none"> • Customized expression • May require pilot expression • Customized QC standard • Affinity testing available (ELISA, BiaCore, and Octet)
Sino Corporate Expression Service Program	TBD	<ul style="list-style-type: none"> • High volume corporate customers • Customized Master Service Agreement • All projects receive highest priority • Corporate package tailored to specific demand • May include both protein and antibody expression services

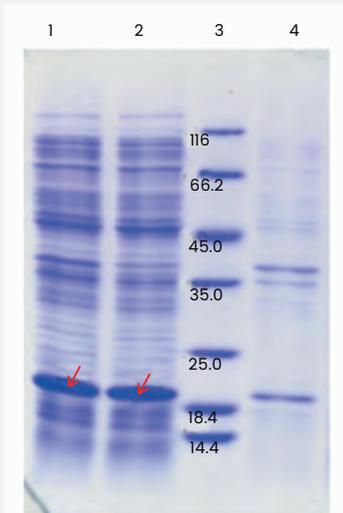
Recombinant Production Service Case Study

Protein Expression in *E. coli*

Project: Soluble tag free protein

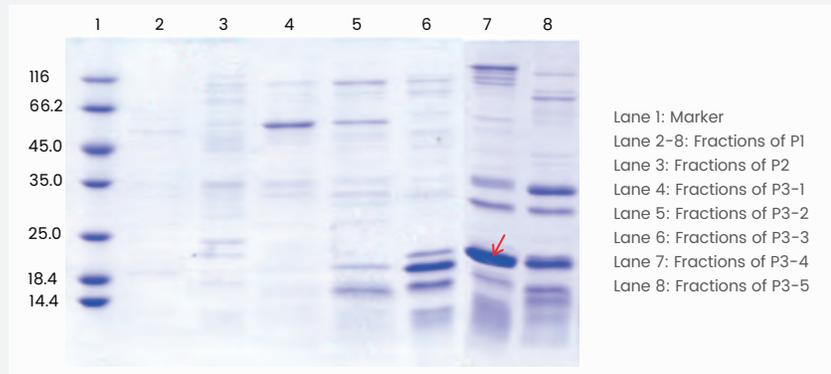
Process: Three-step purification (based on isoelectric point, hydrophobicity and molecular weight)

SDS-PAGE (reducing gel) Target Protein Expression

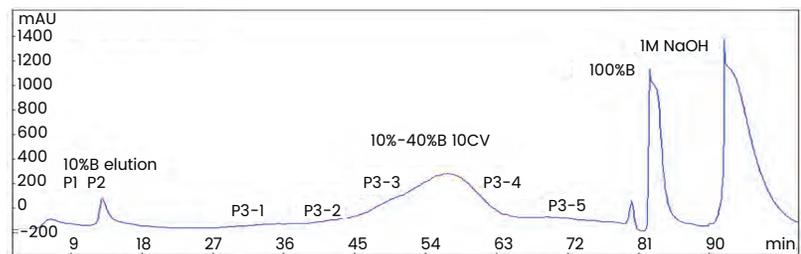


Lane 1: Cell lysate after induction
Lane 2: Soluble fraction
Lane 3: Marker
Lane 4: Pellet

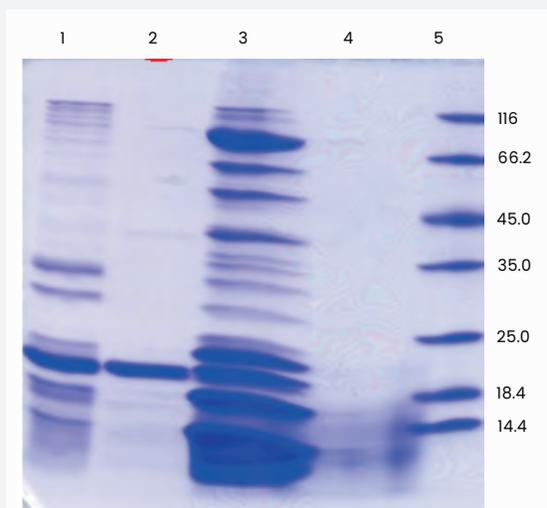
1st step: Protein Purification by SP-FF



Lane 1: Marker
Lane 2-8: Fractions of P1
Lane 3: Fractions of P2
Lane 4: Fractions of P3-1
Lane 5: Fractions of P3-2
Lane 6: Fractions of P3-3
Lane 7: Fractions of P3-4
Lane 8: Fractions of P3-5

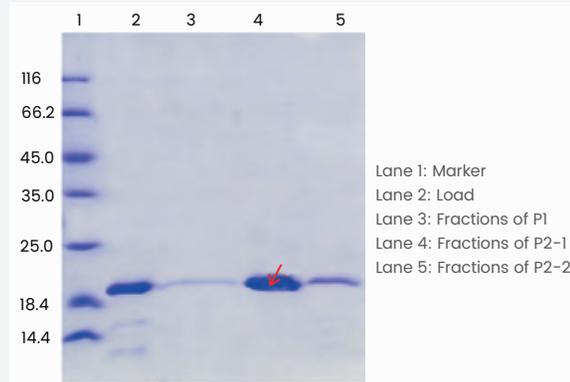


2nd step: Protein Purification by HIC-FF

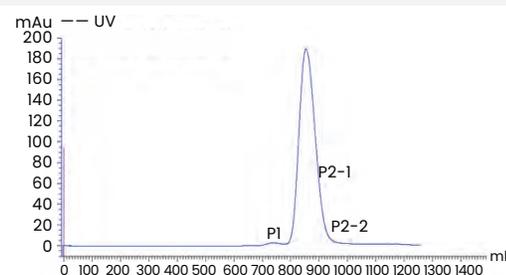


Lane 1: Load
Lane 2: Flow through
Lane 3: Elution 1
Lane 4: Elution 2
Lane 5: Marker

3rd step: Protein Purification by SEC



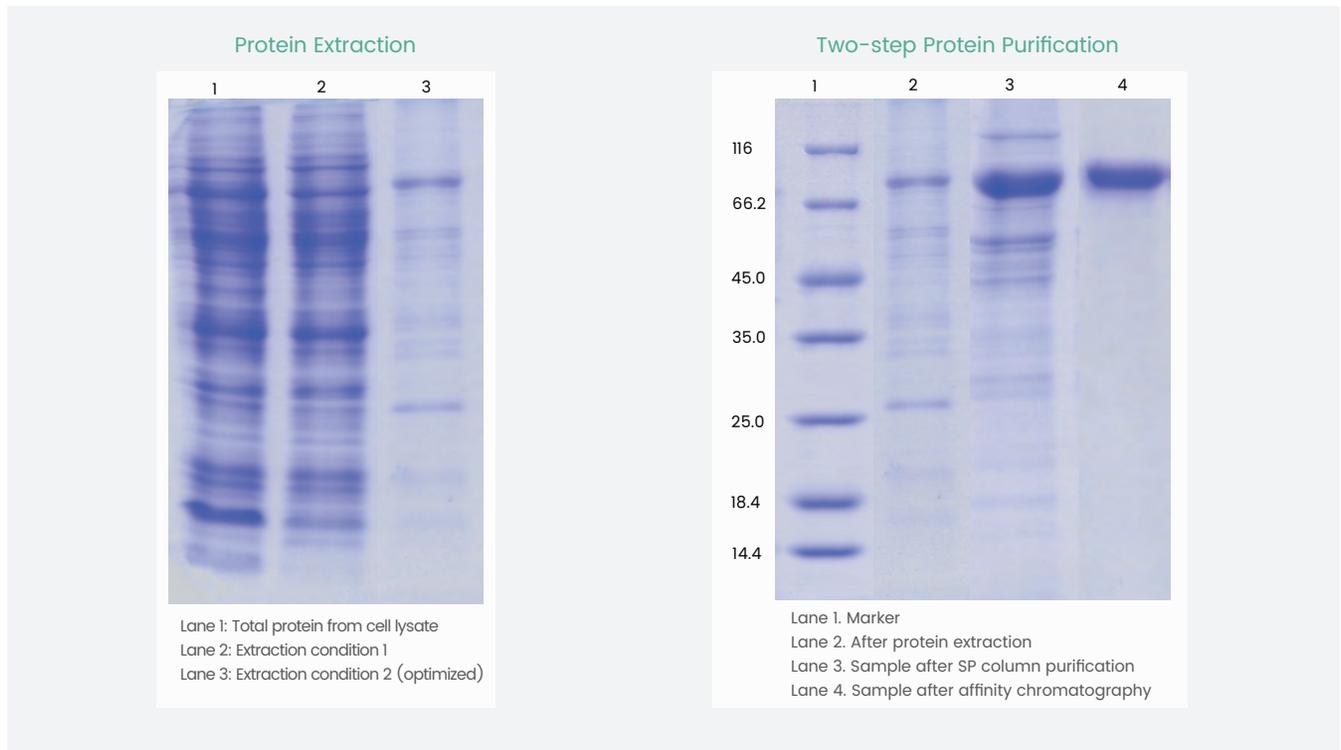
Lane 1: Marker
Lane 2: Load
Lane 3: Fractions of P1
Lane 4: Fractions of P2-1
Lane 5: Fractions of P2-2



Protein Expression in Baculovirus-insect cells

Project: Single-pass membrane protein

Process: Protein extraction optimization and two-step protein purification



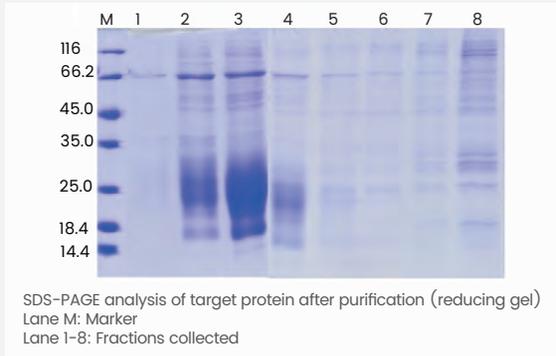
Sino Biological specializes in recombinant protein & antibody production. Powered by its in-house developed technology platforms and proprietary reagents, Sino Biological has rapidly grown into one of the largest protein vendors around the globe. During the past ten years, the company has successfully developed over 10,000 catalog protein products, and completed thousands of customized protein & antibody production projects.

Protein Expression in Mammalian Cells

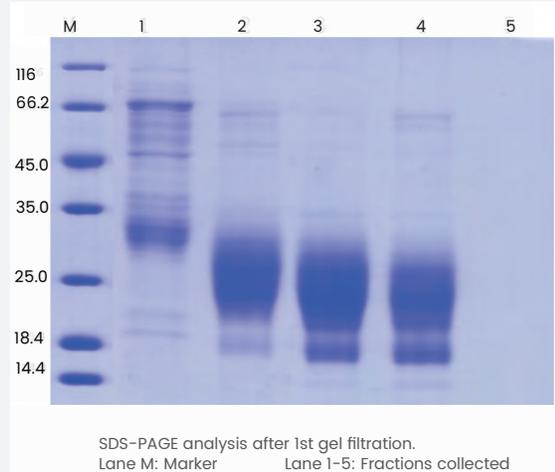
Project: Tag free protein

Requirements : 10 mg, purity >95% by both SEC-HPLC and SDS-PAGE, homodimer fraction >99%, cell-based activity

1st step: Ion Exchange Chromatography

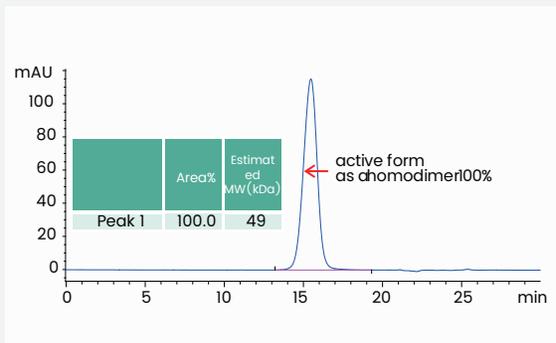


2nd step: Gel Filtration (Fractions 2-4 of Step1 Loaded)

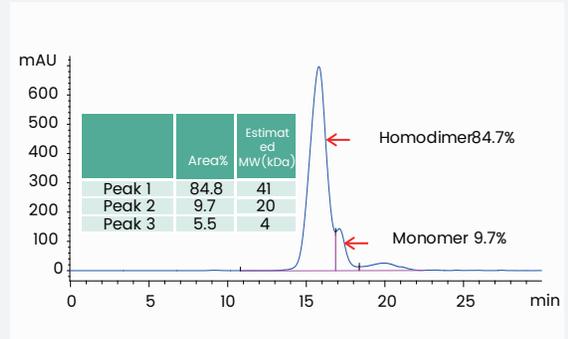


3rd step: Protein Purification by SEC

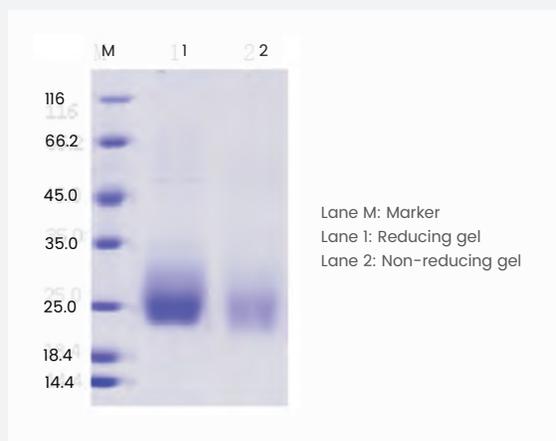
SEC-HPLC Analysis of Protein after 2nd Gel Filtration.



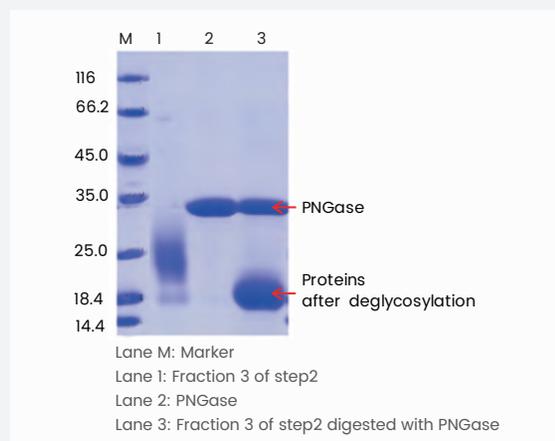
SEC-HPLC Analysis of Protein after 1st Gel Filtration



SDS-PAGE Analysis
(target protein after 2nd gel filtration)



Verification of Glycosylation

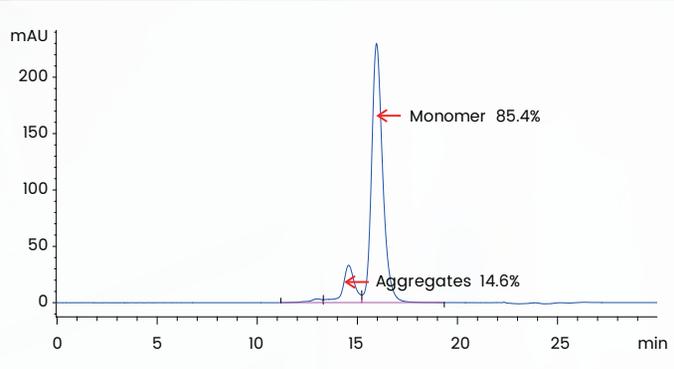




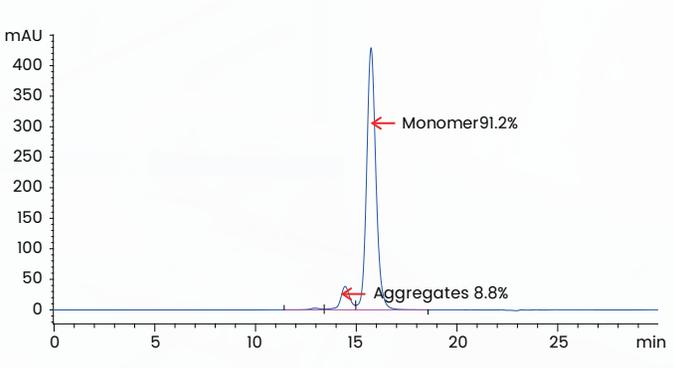
Recombinant Antibody Production in Mammalian cells

Project: Recombinant full length antibody
 Requirements : Purity >99% by SEC-HPLC, ET <0.5 EU/mg

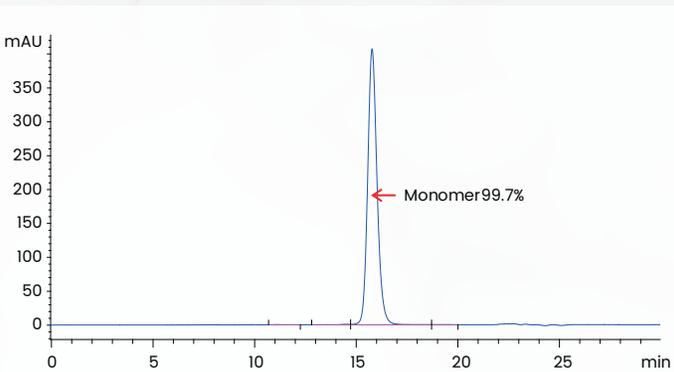
1st step: Protein A Affinity Chromatography



2nd step : 1st Ion Exchange Chromatography



3rd step: 2nd Ion Exchange Chromatography





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