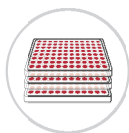


# ACCELERATING YOUR ANTIBODY DISCOVERY



HTP Recombinant  
Antibody Production



Bispecific Antibody  
(BsAb) Production



Large Scale  
Antibody Production



VHH Antibody  
Discovery



Single B  
Cell Screening



Affinity Maturation &  
Antibody Humanization



Hybridoma  
Sequencing



Afucosylated  
Antibody Expression



Stable Cell  
Line Generation



In Vivo Proteins  
and Antibodies

## COMPANY PROFILE

# ABOUT BIOINTRON

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### **Cost-Effective**

Custom Antibodies  
Top Quality  
Competitive Prices



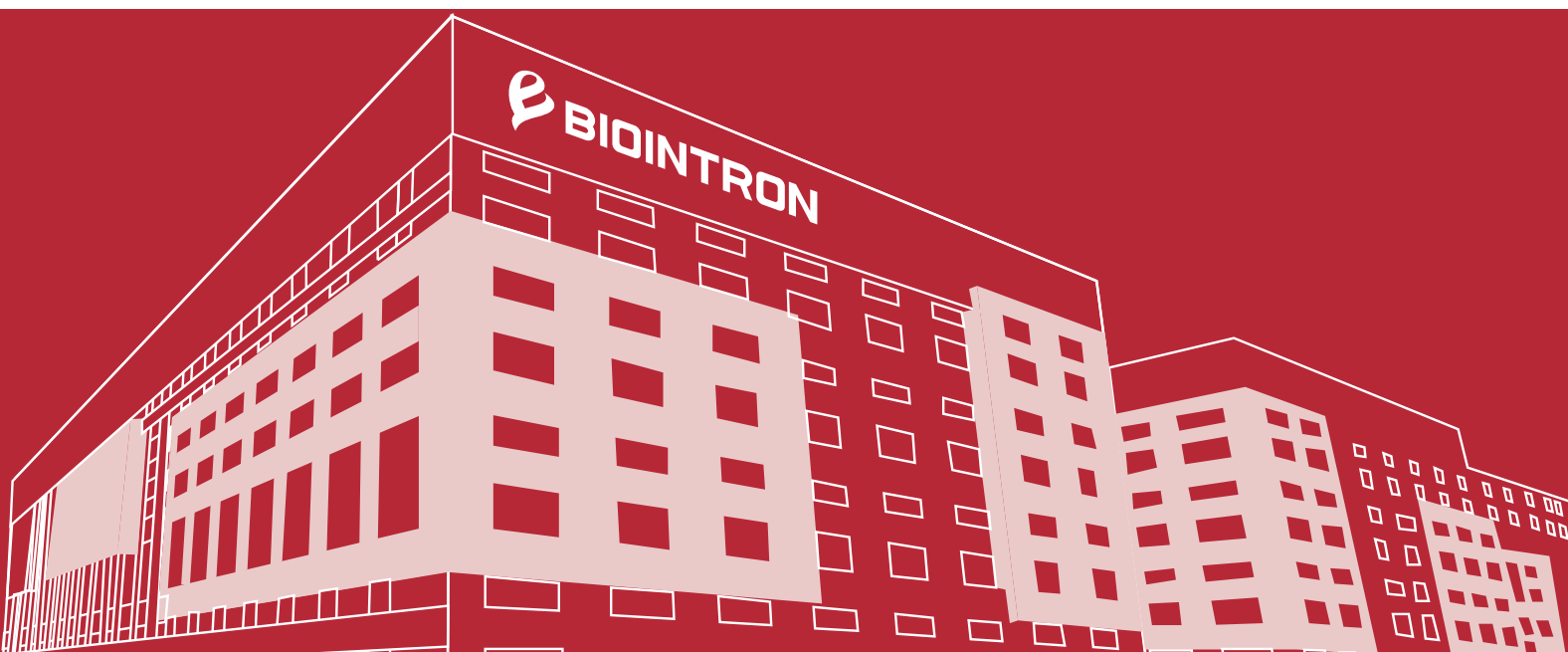
### **Time-Saving**

Automated Systems Deliver Fast  
& Precise Results



### **High-Quality Control**

Strict Standards Ensure  
Top-Notch Antibodies

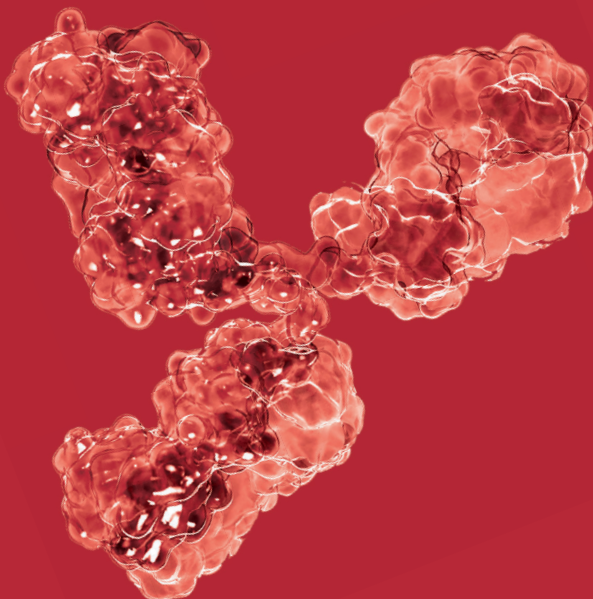


Founded in 2012 and certified to ISO 9001:2015, Biointron is a CRO specializing in antibody discovery, optimization, and expression services for global biotech and pharmaceutical companies. Biointron holds a leading position in the antibody expression industry. From gene sequence to purified antibodies, it only takes 2 weeks. We have delivered tens of thousands of recombinant antibodies for more than 1,500 biotech and pharma companies worldwide.

We provide a one-stop solution for antibody discovery and optimization - including VHH antibody discovery, single B-cell antibody screening, hybridoma sequencing, antibody humanization, antibody affinity maturation, and more.

Additionally, Biointron holds global sublicensing rights for ECACC's CHO-K1. Our CHOK1BN cell line, which is derived from CHOK1, has been filed in the DMF system with the US FDA. By choosing the CHOK1BN cell line, several partners' projects have entered the multicenter international clinical trials successfully.

For more information, please visit our official website [www.biointron.com](http://www.biointron.com), or contact [info@biointron.com](mailto:info@biointron.com)



**12+**

Years of Experience

**1,500+**

Companies Served Globally

**80,000+**

Antibodies Delivered Annually



# CONTENTS

ACCELERATING YOUR ANTIBODY DISCOVERY



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## SERVICES

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## CATALOG PRODUCTS

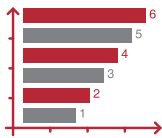
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## HTP RECOMBINANT ANTIBODY PRODUCTION

Biointron's high-throughput antibody production provides the most cost-effective option for recombinant antibodies, where you may choose to deliver either supernatant or purified antibodies (ug to gram level). From gene synthesis to purified antibodies (IgG, scFv, VHH, etc.), it takes as fast as 2 weeks. Any isotype, format, or antibody fragment can be expressed with no amount limitations.

### FEATURES



#### High Throughput

1000+ mAb/batch



#### 2 Weeks

As fast as 2 weeks for production,  
including gene synthesis



#### Expertise

12+ years of experience  
on antibody production

QC Standards: SDS-PAGE >95%, Endotoxin <1 EU/mg, SEC-HPLC Detection

### WORKFLOW



Sequence Design  
and Synthesis



Plasmid Construction  
and Preparation



Transient  
Expression



Delivery



Stringent Quality  
Control



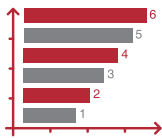
Affinity  
Purification

## BISPECIFIC ANTIBODY (BSAb) PRODUCTION

Bispecific antibodies represent a key component of the next-generation of antibody therapy. Bispecific antibodies can target more than two different antigens at the same time. For instance, they can simultaneously bind tumor cell receptors while recruiting cytotoxic immune cells.

Biointron has expressed thousands of bispecific antibodies, and we have extensive experience in bispecific antibody production. Any format can be expressed.

### FEATURES



**High Throughput**  
500+ molecules/batch



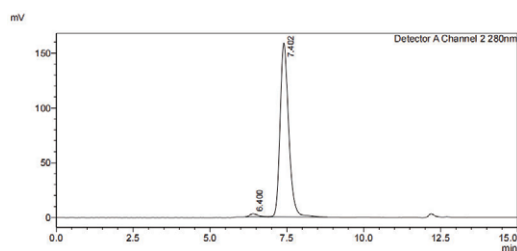
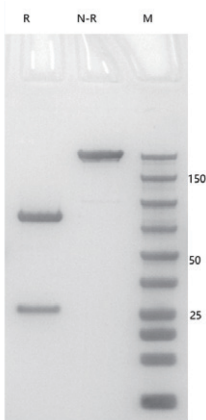
**Customized Service**  
Any format can be produced



**Fast Turnaround Time**  
As fast as 3 weeks

### CASE STUDY

#### IgG-scFv



DetectorA Channel 2 280nm

Peak#	Ret. Time	Area	Height	Conc.
1	6.400	55403	3012	1.761
2	7.402	3091146	158654	98.239
Total		3146550	161666	

Lane R: Reducing, Lane N-R: Non-Reducing, Lane M: Protein Marker

## LARGE SCALE PRODUCTION

Producing therapeutic antibodies or proteins in large quantities is required for many applications, including in vitro studies, in vivo animal studies, and pre-clinical trials. Biointron's large-scale Producing services offers scaled-up production of recombinant antibodies/proteins from hundreds of milligrams to gram levels within weeks.

### FEATURES



#### Consistency

All products come from one batch,  
SDS-PAGE >95%, SEC-HPLC >95%,  
endotoxin level <0.1 EU/mg



#### Fast Turnaround Time

As fast as 4 weeks for  
gram-level production

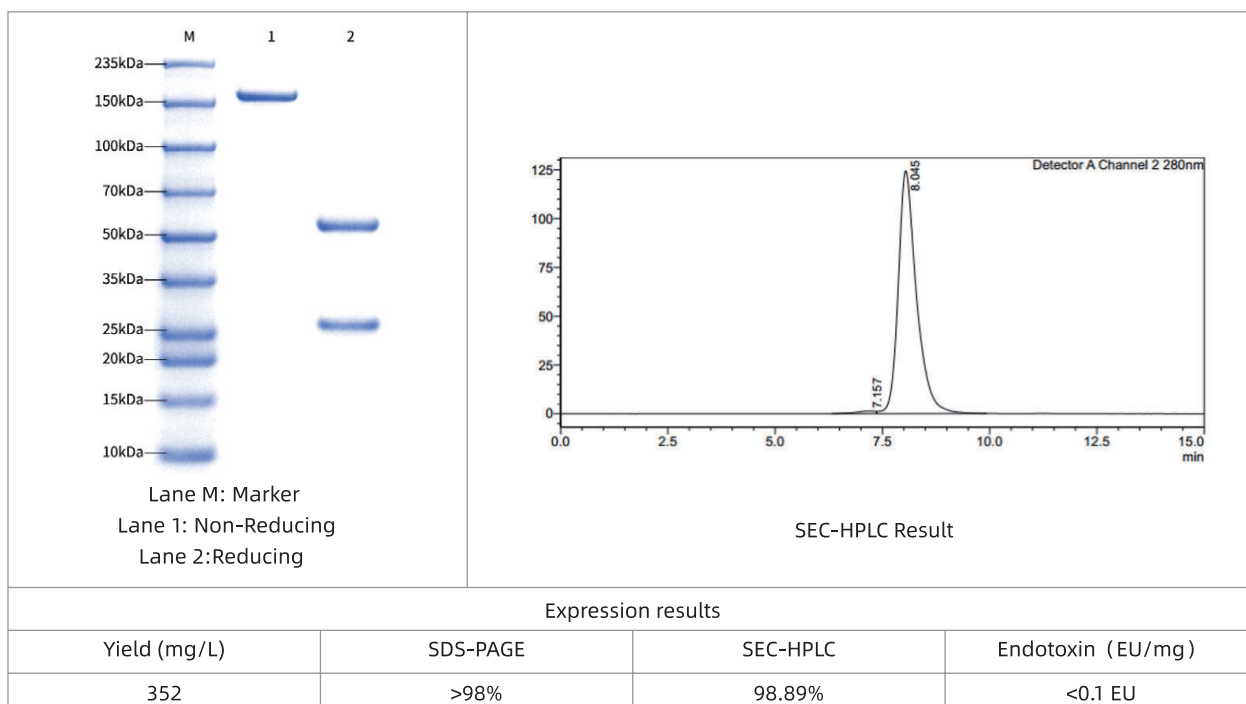


#### High Capacity

Up to the hundred-gram

### CASE STUDY

#### 1000 mg recombinant mAb production in CHO cells





# VHH ANTIBODY DISCOVERY

SdAb or VHH is a promising next-generation therapeutic antibody technology for cancer immunotherapy and other applications.

Biointron is a well-recognized leader in the field of single domain antibody discovery. Based on our advanced phage display technology and high-throughput antibody expression platform, our scientists are specialized in the production and discovery of specific single domain antibodies.

## FEATURES



**Self-owned Alpaca  
Breeding Farm**

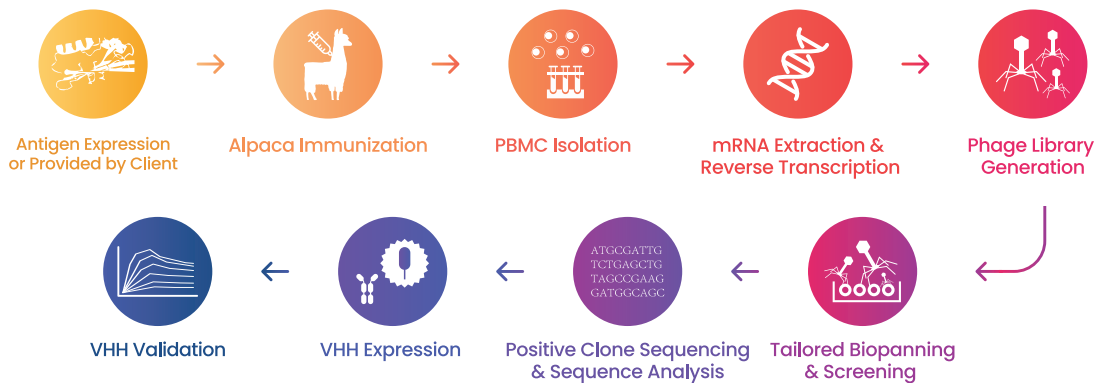


**200+ Projects  
Delivered**

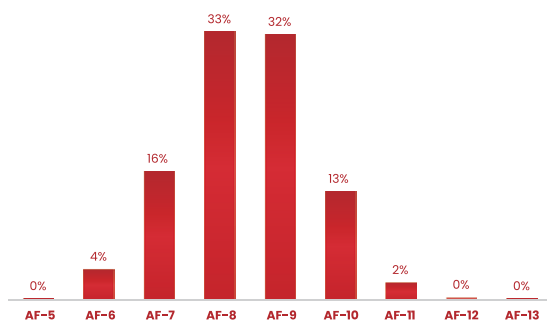


**High Diversity &  
Large Capacity**

## WORKFLOW



**Biointron VHH Affinity distribution \***

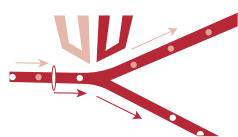


From our platform, VHH antibody hits with affinity ranges from 10<sup>-6</sup> to 10<sup>-11</sup> M have been generated, with most falling within 10<sup>-8</sup> and 10<sup>-9</sup> M. It should be noted that the presented data represents only a portion of projects from one client and may have sampling bias. The distribution of hits with different affinity may not reflect the variance between different targets. The data is from SPR affinity measurement.

## SINGLE B CELL ANTIBODY DISCOVERY

Biointron offers a high-throughput, fully integrated platform for accelerating antibody discovery. Biointron's high-throughput single B cell screening platform can screen  $2 \times 10^6$  plasma B-cells from immunized animals. Antigen specific antibody-secreting cells can be isolated. It allows the detection of potentially rare antibodies or drugs with unique properties.

### FEATURES



Microfluidic Technology

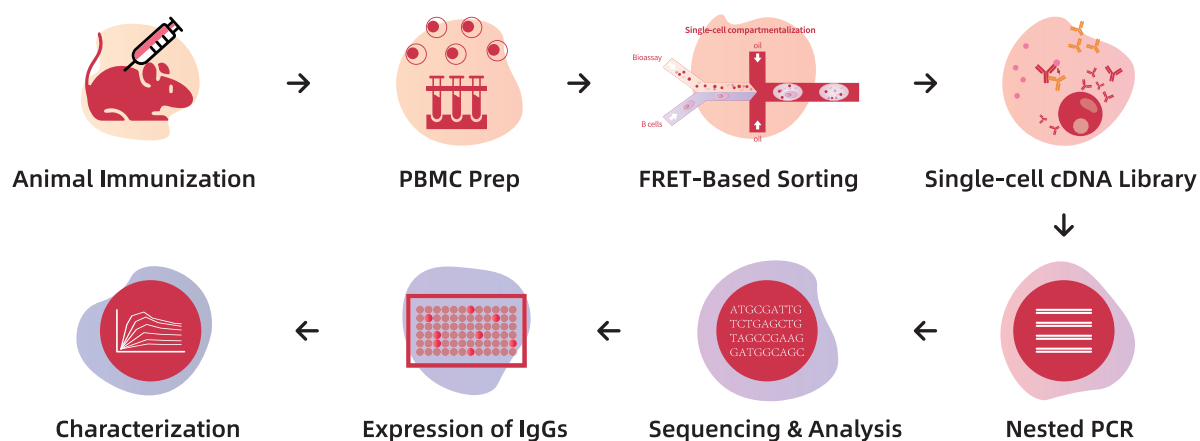


High Efficiency

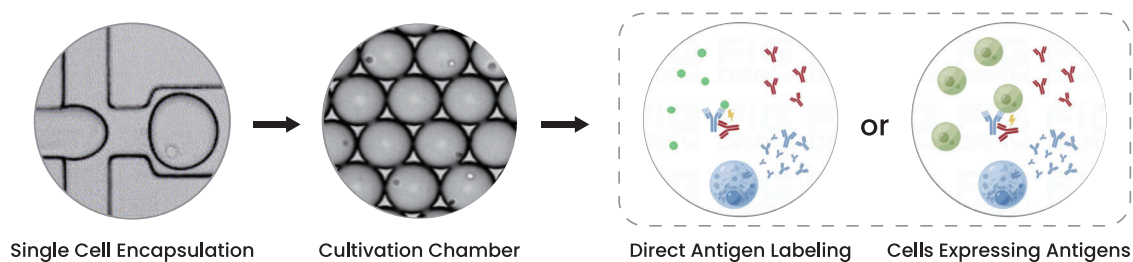


2-3 Months

### WORKFLOW



### SINGLE B CELL SCREENING PROCESS



# AFFINITY MATURATION

## FEATURES

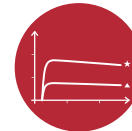


### FCMES - AM<sup>®</sup>

Full Coverage Mammalian  
Expression System



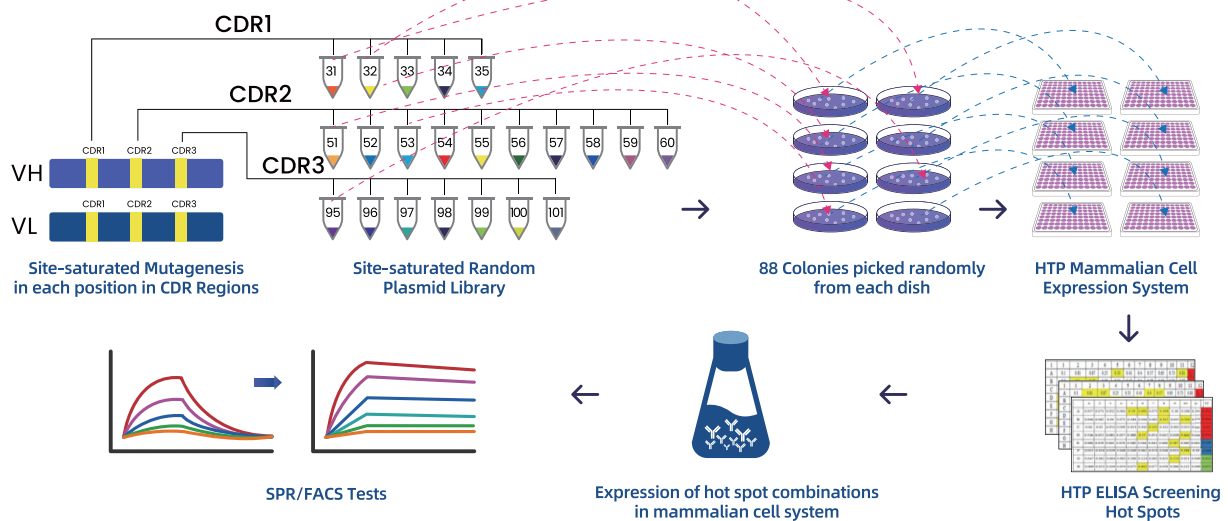
### No-bias Site Saturation Mutagenesis in CDR Region



### At least 5-fold Affinity Improvement Guaranteed

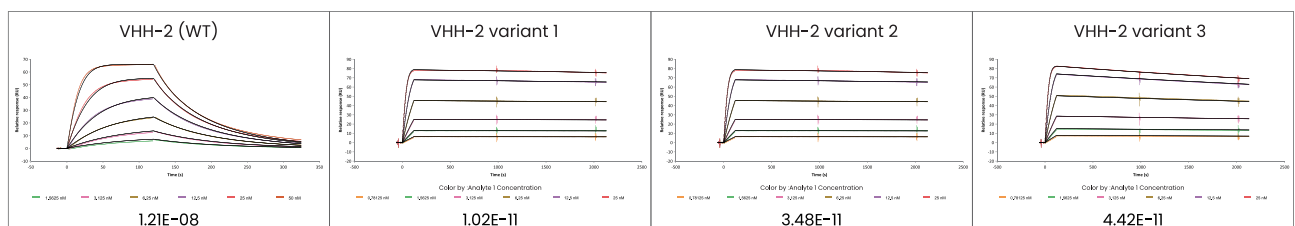
FCMES - AM<sup>®</sup> (Full Coverage Mammalian Expression System) is Biointron's proprietary platform for affinity maturation. Each amino acid in the CDR region will be mutated to the other 18 amino acids (except Cysteine) with equal ratios. The clones will be expressed in a mammalian system and an ELISA binding assay will be conducted as an initial test, followed by SPR or FACS for further affinity measurement.

## WORKFLOW



## CASE STUDY

The affinity increases 1186-fold, 348-fold and 274-fold separately.



## ANTIBODY HUMANIZATION

Recombinant antibody technologies are rapidly becoming available and showing considerable clinical success. However, murine monoclonal antibodies may induce immunogenic responses, potentially limiting their application for humans. Humanized antibodies can overcome these problems and are considered to be a promising alternative therapeutic agent.

Biointron's antibody humanization service is based on CDR grafting and back mutation with PTM analysis.

### FEATURES



#### Affinity Guaranteed

No less than 3 times drop



#### Fast Turnaround Time

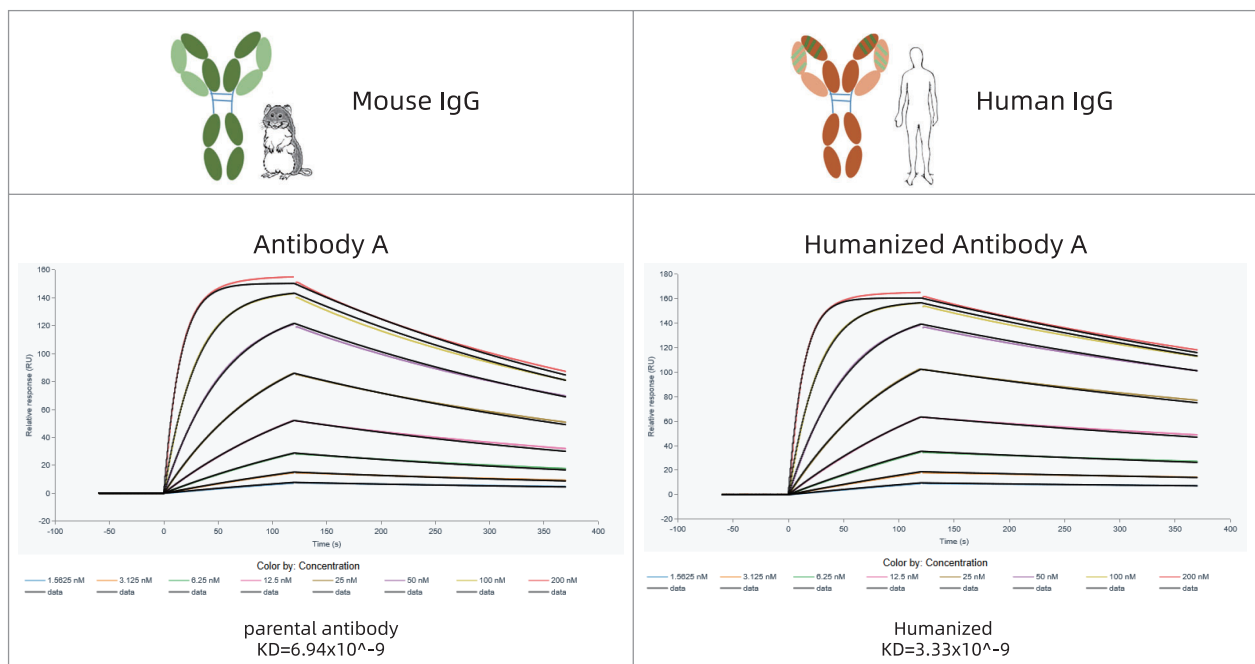
As fast as 4 weeks



#### Expertise

10+ years in humanized antibody design

### CASE STUDY



## HYBRIDOMA SEQUENCING

The antibody sequence is crucial for patent applications (distinguish your antibody from others), recombinant antibody expression, antibody engineering (humanization & affinity maturation), and more.

Biointron offers a high-quality hybridoma sequencing service, for the sequencing of variable regions of monoclonal antibodies produced from hybridoma cell lines. Once the sequences are confirmed, the recombinant antibody can be expressed and purified in as fast as 2 weeks.

### FEATURES



#### 5' RACE

Simple and reliable



#### Fast Turnaround Time

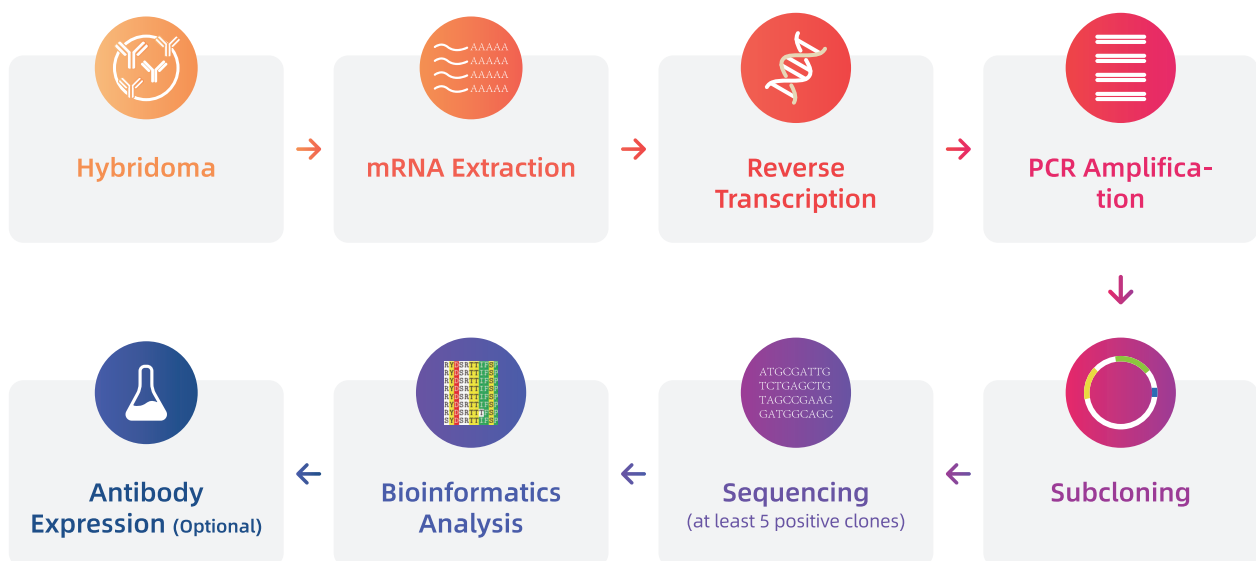
1 week



#### 100% Accuracy

Cross-verified with 5 independent clones

### WORKFLOW



## AFUCOSYLATED ANTIBODY EXPRESSION

Biointron' s fucose-free host cell CHOK1BN-Fut8KO can be used for industrial production following antibody characterization and functional verification. Compared to the unmodified CHOK1BN cell line, the antibody produced by the modified cell line not only achieves afucosylation but also maintains consistency in terms of expression quantity and quality.

### FEATURES



#### Fut8 Gene Knock-Out Cell Line

We guarantee the host cell line will have fucose removed



#### High Yield and Quality

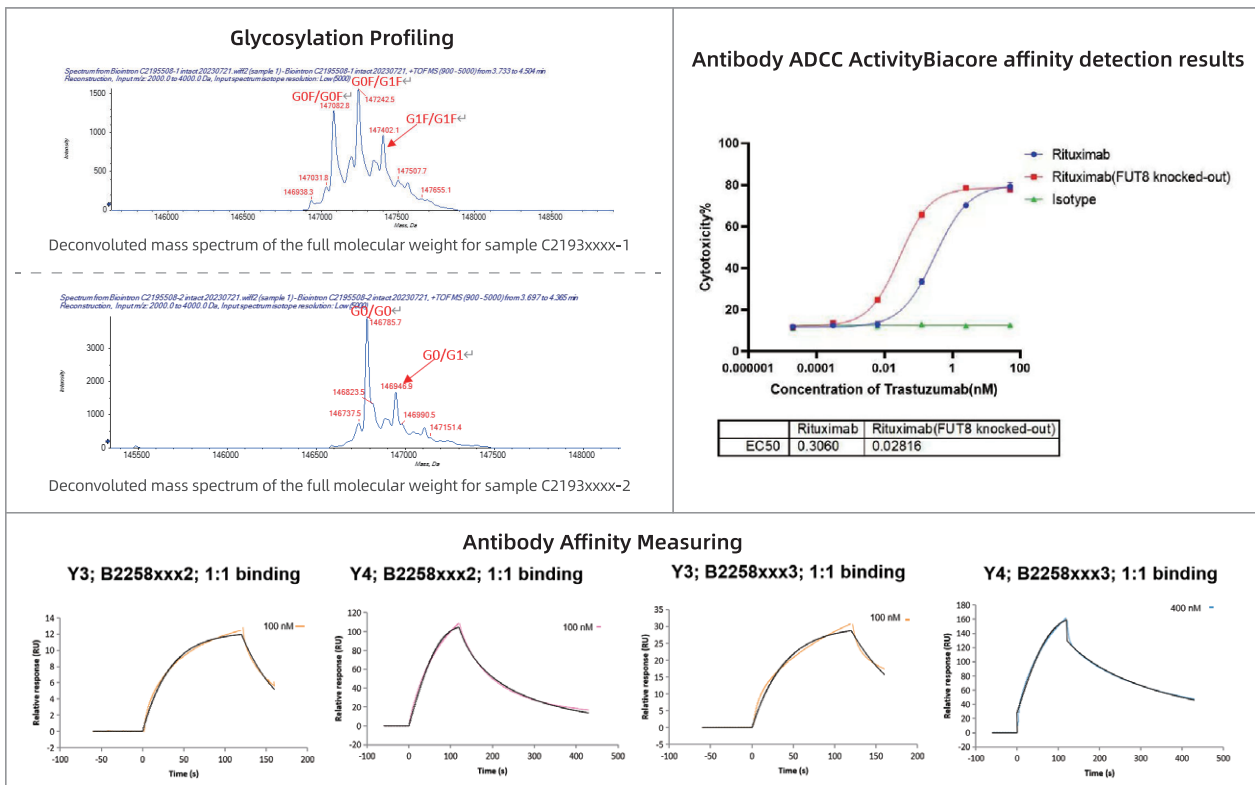
Produce antibodies with high purity and low endotoxin levels



#### Customized Services

Fast antibody delivery cycle for purified antibodies

### CASE STUDY



## CHO-K1 STABLE CELL LINE GENERATION

Biointron provides a stable cell line development service for bioproduction purposes. Our stable cell line service, based on ECACC licensed CHO-K1 cells, aims to provide a high-yield guaranteed and speedy timeline to meet your downstream applications.

### FEATURES



**High-Yield**  
>5 gram/L for antibody



**Expertise**  
10+ years of experience,  
100+ cell lines delivered



**No Royalty Fee**  
For multiple products

### WORKFLOW



## COMMERCIAL LICENSE FOR CHOK1BN

Biointron's CHOK1BN cell line, licensed from ECACC (CHO-K1), is suspension-adapted in basic CD media. The cell line can be sublicensed for commercial use, and it meets the requirements for registration in both China and US.

### FEATURES

Worldwide  
Sublicense

No Royalty Fee

Perpetual &  
Irrevocable

Meets the requirements  
for registration in  
both China and US

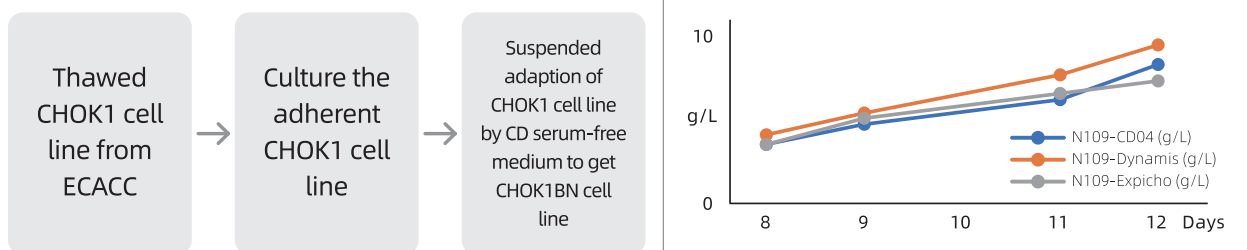
### FEATURES OF CHOK1BN

Suspension-adapted in  
basic CD medium and can  
apply to various medium

High stability and  
productivity (>5 g/L)

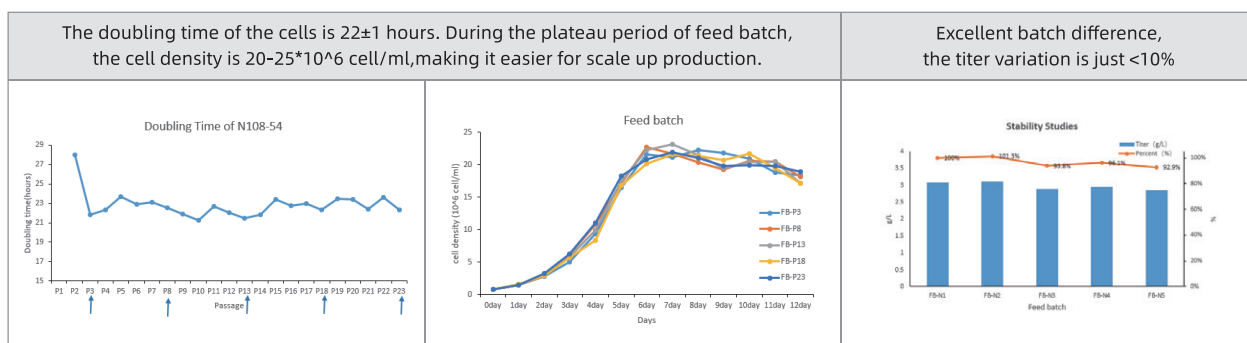
Suitable for monoclonal  
antibody, bispecific  
antibody, factors, etc

### Adaption of CHOK1BN



Suitable for various medium with high monoclonal antibody yield

### FOR RECOMBINANT PROTEINS: STABILITY TEST FOR OVER 2 MONTHS





## BENCHMARK POSITIVE ANTIBODY

- ✓ To benchmark novel biotherapeutics (biologics) for pre-clinical lead identification
- ✓ For the development of potency assays

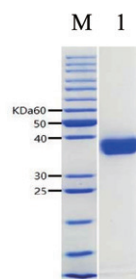
FOR RESEARCH USE ONLY

### SPECIFICATIONS

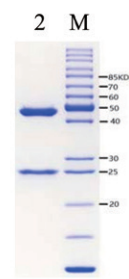
Endotoxin < 1.0 EU/mg determined by the LAL method

Purity > 95% determined by SEC-HPLC

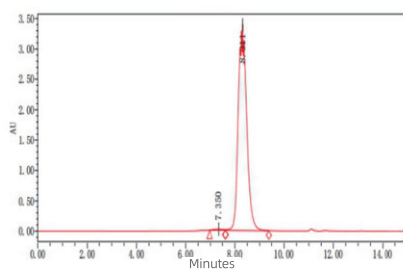
SDS-PAGE Image of Human PDL1/His Protein



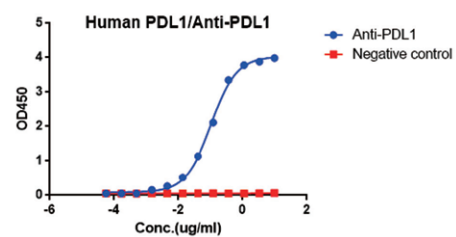
SDS-PAGE Image of Anti-PDL1 Antibody



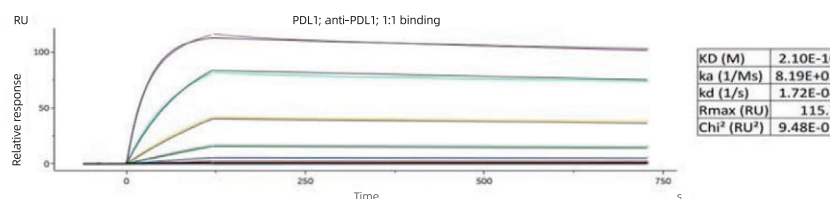
The purity was more than 99% as determined by SEC-HPLC



Human PD-L1 Protein, His Tag (Cat. No. H-PDL1-1) can bind Research Grade Anti-PDL1 Antibody



Kinetics analysis for PDL1(Cat: H-PDL1-1) binding to Research Grade V6 Anti-Human PD-L1 (Atezolizumab) (Cat: B2016)(Top dose 40nM, 3-fold dilution)



**Observations:**

Close KD values were obtained for PDL1 binding to anti-PDL1 antibody compared with historical data (0.4m).

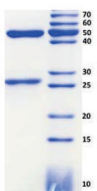
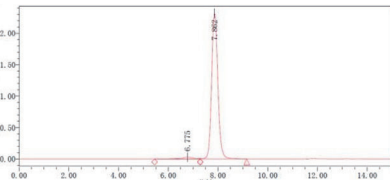
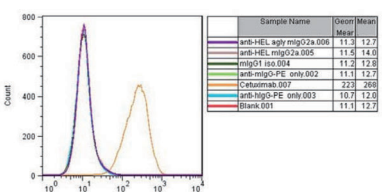
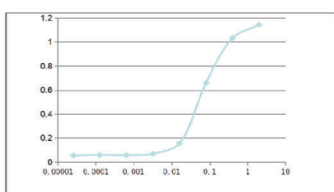
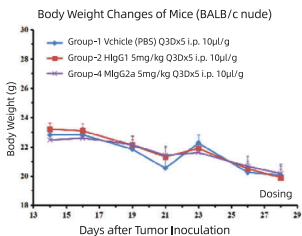
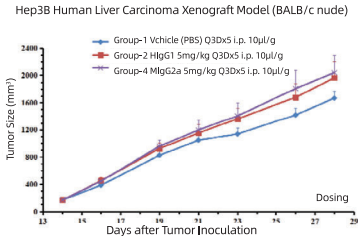
## ISOTYPE NEGATIVE ANTIBODY

Choosing the correct isotype control antibody is an important part of most antibody-based experiments. Isotype control antibodies have no relevant specificity, and they enable the researcher to distinguish non-specific backgrounds binding from antigen-specific antibody binding.

Our isotype controls are specific anti-HEL (Hen Egg Lysozyme) and has no known cross-reactivities to humans.

Number	Product Name	Number	Product Name
B118301	V6 Mouse IgG1-Kappa Isotype control-B118301	B109801	V6 Human IgG1(N297A)-Kappa Isotype control
B115101	V6 Mouse IgG2A-Kappa Isotype control	B107803	V6 Human IgG2-Kappa Isotype control
B192301	V6 Mouse IgG2A LALA-kappa Isotype control	B109803	V6 Human IgG3-Kappa Isotype control
B117901	V6 Human IgG1-Kappa Isotype control	B109805	V6 Human IgG4(S228P/L235E)-Kappa Isotype control
B109802	V6 Human IgG1 LALA-Kappa Isotype control	B107804	V6 Human IgG4(S228P)-Kappa Isotype control

\* FOR MORE PRODUCTS AND RELATED DETAILS, PLEASE CONTACT US AT WWW.BIOINTRON.COM

<p>SDS-PAGE Image of Human IgG1 Isotype Control mAb</p> 	<p>The purity was more than 98% as determined by SEC-HPLC</p> 
<p>No cross-reactivity (e.g. A549 cells, FACS)</p> 	<p>Specific binding to HEL (ELISA)</p> 
<p>Body Weight Changes of Mice (BALB/c nude)</p> 	<p>Hep3B Human Liver Carcinoma Xenograft Model (BALB/c nude)</p> 

**12<sup>+</sup>**

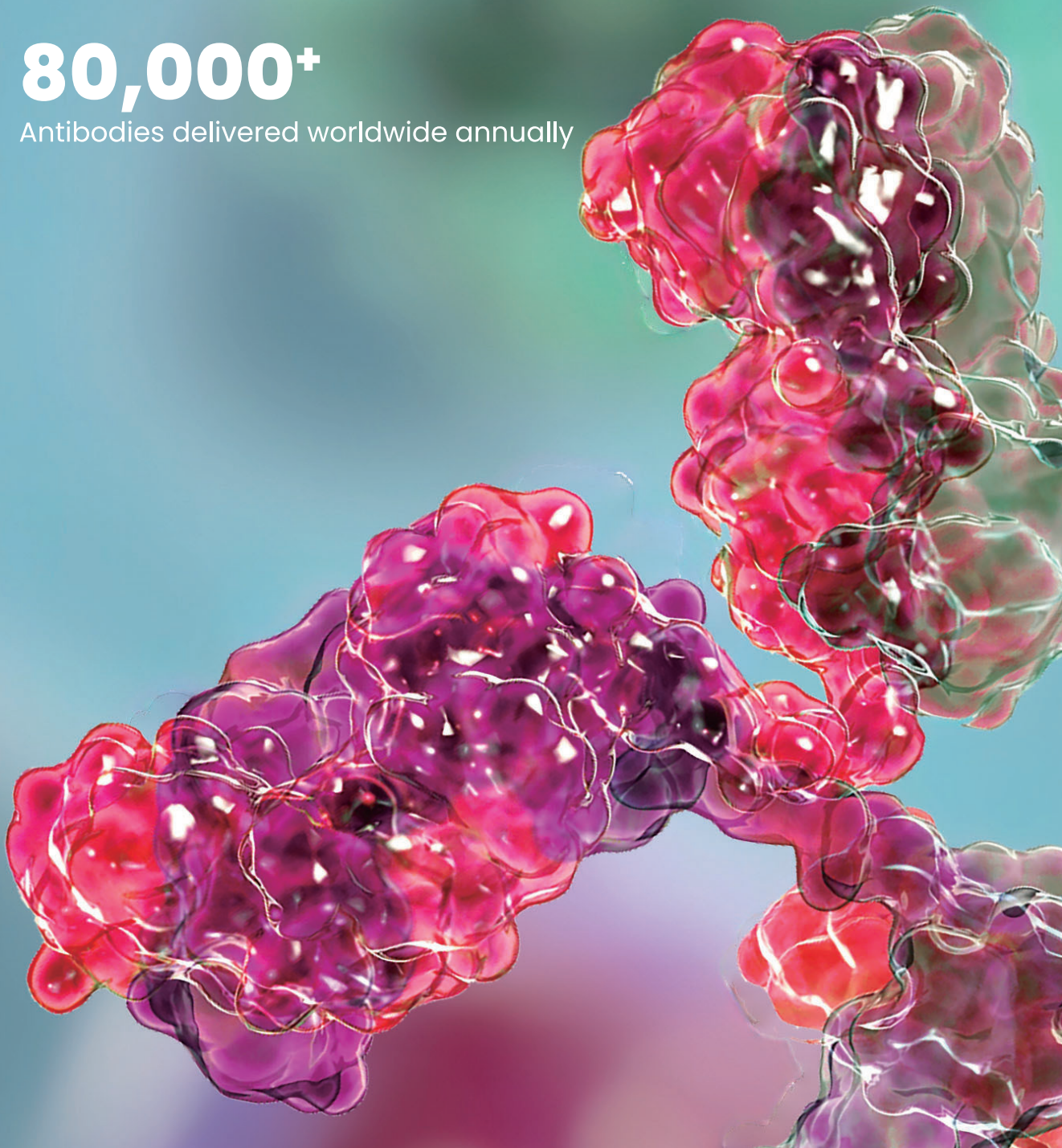
Years of experience in antibody  
discovery, production, and optimization

**1,500<sup>+</sup>**

Companies Served Globally

**80,000<sup>+</sup>**

Antibodies delivered worldwide annually





We specialize in antibody production and discovery - dedicating ourselves to advancing human health and promoting sustainability with more than 10 years of experience. We offer premium solutions at competitive rates, all anchored in our commitment to a brighter and healthier future.


- Founded in 2012 in Taizhou, China
- Global sublicensing rights for ECACC's CHO-K1
- One-stop solution for antibody development
- ISO-9001:2015 certificate





## CONTACT US


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