

Uniting Drug Development Expertise with Protein Production Excellence



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WuXi Biologics Protein Sciences

WuXi Biologics' industry-leading Protein Sciences (PS) Department specializes in the development and production of monoclonal, bispecific and multispecific antibodies, fusion-proteins, cytokines, enzymes and other biologics. Our team of experts can support the preparation of the most complex proteins to provide one to hundreds of standard antibodies and proteins for your diverse needs.

Projects can be structured by either a FTE (Full Time Equivalent) or FFS (Fee For Service) model to meet your project needs. Our labs feature high-throughput expression and purification systems to maximize efficiency.



Mammalian Platform Features

- CHO, HEK293 cell lines for antibodies and non-antibodies such as Fc-fusion proteins and His- or Flag-tagged proteins
- Engineered CHO cell lines for glycan modulation of antibodies and proteins
- NS0 cell line is well suited to produce hard to express proteins such as cysteine rich proteins; successfully delivered hundreds of challenging proteins which failed in other expression systems
- Offer developability studies that deliver data that is highly representative of eventual large-scale production processes
- Automated expression, purification, and analytics
- Offer CMC-like process providing highly-representative developability study results for therapeutic products

WuXian™ Transient

Timeline	Average Yield (CHO)	Expression Volume
3-5 weeks	2.2 g/L	1 mL to 20 L

WuXian™ Express

Timeline	Average Yield (CHO)	Expression Volume
6-7 weeks	3.5 g/L	20 mL to 25 L

WuXian Transient and WuXian Express Platform Features:

- Projects start from customer-provided amino acid sequence (with codon optimization), DNA sequence, or plasmids
- Deliver high-quality products after 1-2 purification steps suitable for most *in vitro* and *in vivo* studies
- Provide comprehensive QC data

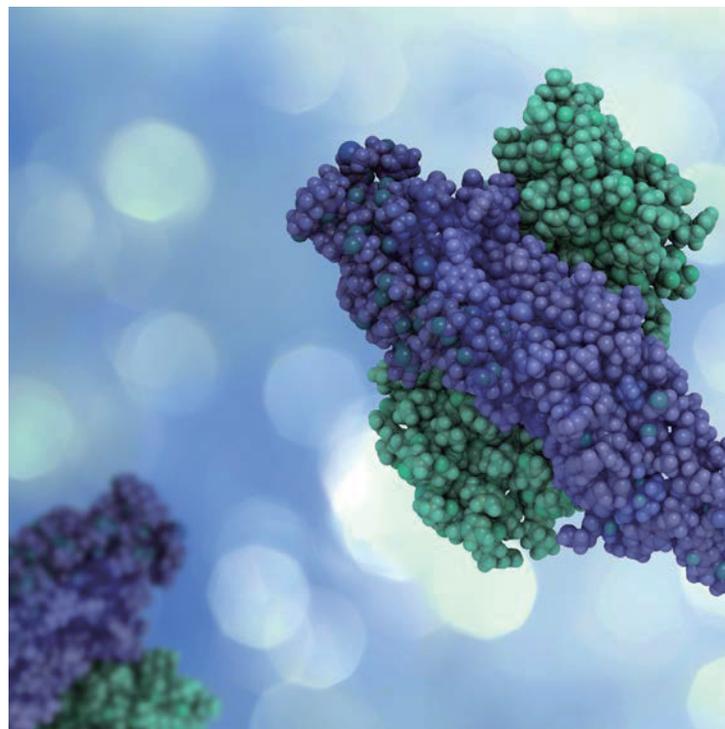


Expedited 777 Mammalian Transient Production Service for Standard mAbs such as IgG

Standard Antibody Production Platform

7 Days	Construct Generation	VH & VL segments
7 Days	Expression	5-5,000 mg
7 Days	Purification & QC	>95% purity 2-step purification

These timelines represent the typical turnaround time for a regular monoclonal antibody. More complex molecules such as bispecific antibodies, Fc-fusion proteins, and other recombinant proteins usually have longer timelines.





Non-Mammalian Platform Features

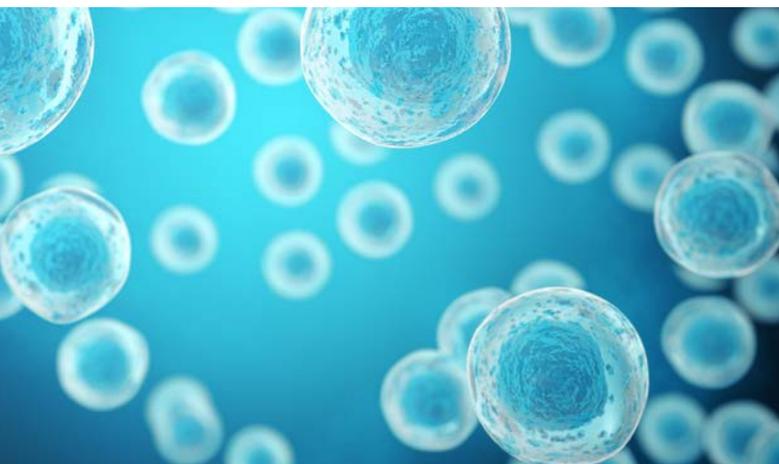
- High-throughput protein refolding condition screen
- Screening and engineering of GPCR constructs
- Easy to scale-up process for manufacturing
- Development of multi-step, non-tag protein purification method

Insect

Process	Timeline
Bac-to-Bac	4-6 weeks
flashBac	3-5 weeks
S2 transient	3-4 weeks
S2 stable pool	5-6 weeks

Insect Platform Features:

- Projects start from customer-provided amino acid sequence (with codon optimization), DNA sequence, or plasmids
- Deliver product and QC data after multiple purification steps
- Multiple insect production cell lines available, including: Sf9, Sf21, HighFive, ExpiSf9, Drosophila S2 cell, with flexible transfection strategies (classical Bac-to-Bac, flashBac, S2 transient, and stable pool)
- Experience working with challenging molecules like membrane proteins and tag-less proteins requiring, for example, screening and reformation of GPCR mutants or development of multi-step purification processes from scratch
- Expertise available for reconstitution of membrane proteins into nanodiscs



E. coli

Process	Timeline
Cell free	2-3 weeks
Soluble protein production	2-4 weeks
Inclusion body and refolding production	4-6 weeks

E. coli Platform Features:

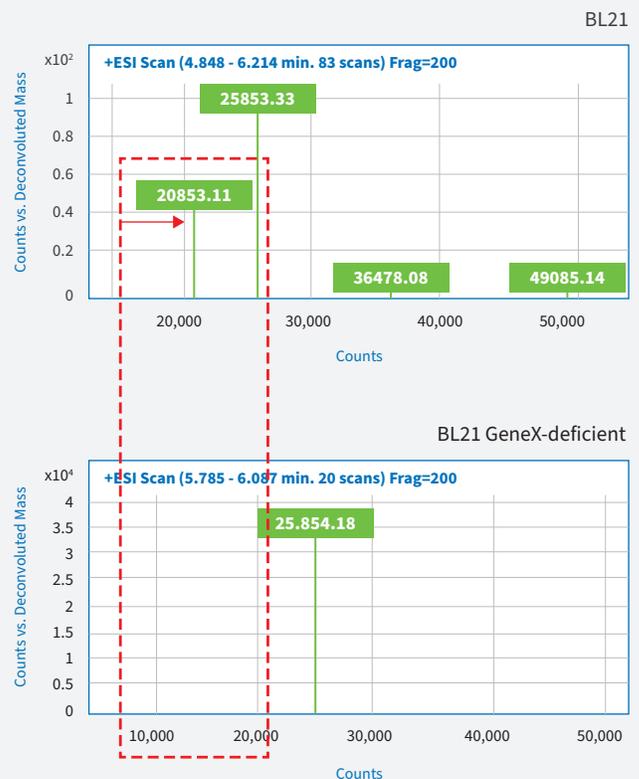
- Projects start from customer-provided amino acid sequence (with codon optimization), DNA sequence, or plasmids
- Deliver product and QC data after multiple purification steps
- A toolbox for hard-to-express targets, including host strains, cultural conditions, and plasmid designs
- High-throughput screening for evaluation of protein refolding conditions (over 200 refolding conditions established)
- Cell-free expression system available for the screening of hard-to-express proteins and various mutants

E. coli Strain Engineering:

- Optimizes the purification of desired proteins

Case Study: Engineering of E. coli HCP Free Strain

LC/MS results showing before and after purification of a GeneX-deficient protein and elimination of GeneX contamination



Industry-Leading Timelines

We offer industry-leading timelines from construct generation to shipment of your product based on the quality and quantity of protein requested.

Timeline	Quantity	Product
2-7 weeks	unlimited	Regular antibody
3-10 weeks	unlimited	Bispecific/multispecific antibody
8 days	gram-level	COVID-19 antibody expression and purification
2.5 months	unlimited	Completion of COVID-19 antibody IND application

In special expedited scenarios (e.g., COVID-19/pandemic emergency production), we can deliver gram level quantities of antibody in 8 days or less! For most recombinant proteins, depending on scale and scope of the production required, the timelines represented here may apply contingent upon protein expression in our cell lines.

Unlimited Capacity

Extensive facilities, high-throughput equipment, and highly-trained staff available to deliver:

- 5,000+ proteins delivered each year
- 2,000+ bispecific antibody product experience
- 3,000+ antigen product experience
- Fast response and immediate initiation of your projects (after receiving AA/DNA sequence)
- Diversified expression platforms, including mammalian, *E. coli*, insect, and yeast
- FTE-based service models



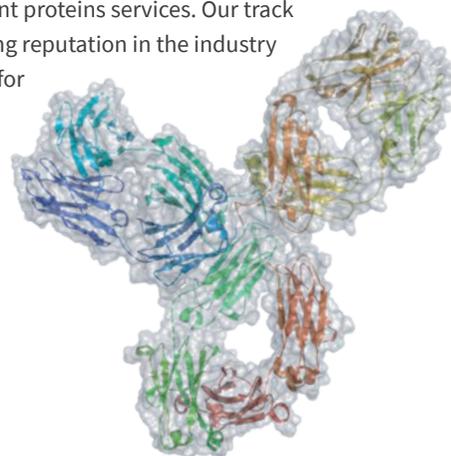
Elite Quality

- Proprietary codon optimization algorithm generates higher expression and improved protein quality on WuXian Platform
- Multiple cell lines and cell culture processes offer more solutions for optimization of product quality
- Same vector system and host cell line for transient and stable transfection ensures consistent quality across all production platforms
- High-throughput automated expression, purification, and analytic systems
- Unique protein production toolbox for bispecific/multispecific antibodies to ensure successful delivery with outstanding efficiency

WuXi Biologics Protein Sciences

Equipped with the industry-leading expertise, extensive experience, state-of-the-art facilities and proprietary technologies, WuXi Biologics' PS Department offers our customers the high-throughput, high titer and high purity antibody and protein production for a variety of applications, including but not limited to antibody drug development, small molecular drug targets, animal health, as well as agriculture.

With a commitment to innovation and quality, WuXi Biologics' PS Department is well-positioned to support the growing demand for antibodies and recombinant proteins services. Our track record of success and strong reputation in the industry make us a trusted partner for clients around the world.



About WuXi Biologics

WuXi Biologics is a leading contract research, development and manufacturing organization (CRDMO) that provides end-to-end capabilities to healthcare organizations worldwide. With operations in China, the United States, Ireland, Germany, and Singapore, we enable our partners to effectively and efficiently bring biologics and vaccines to patients worldwide through our comprehensive and high-quality drug development model.

The world's leading global single-source platform from concept to commercialization.

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WuXi Biologics
Global Solution Provider

