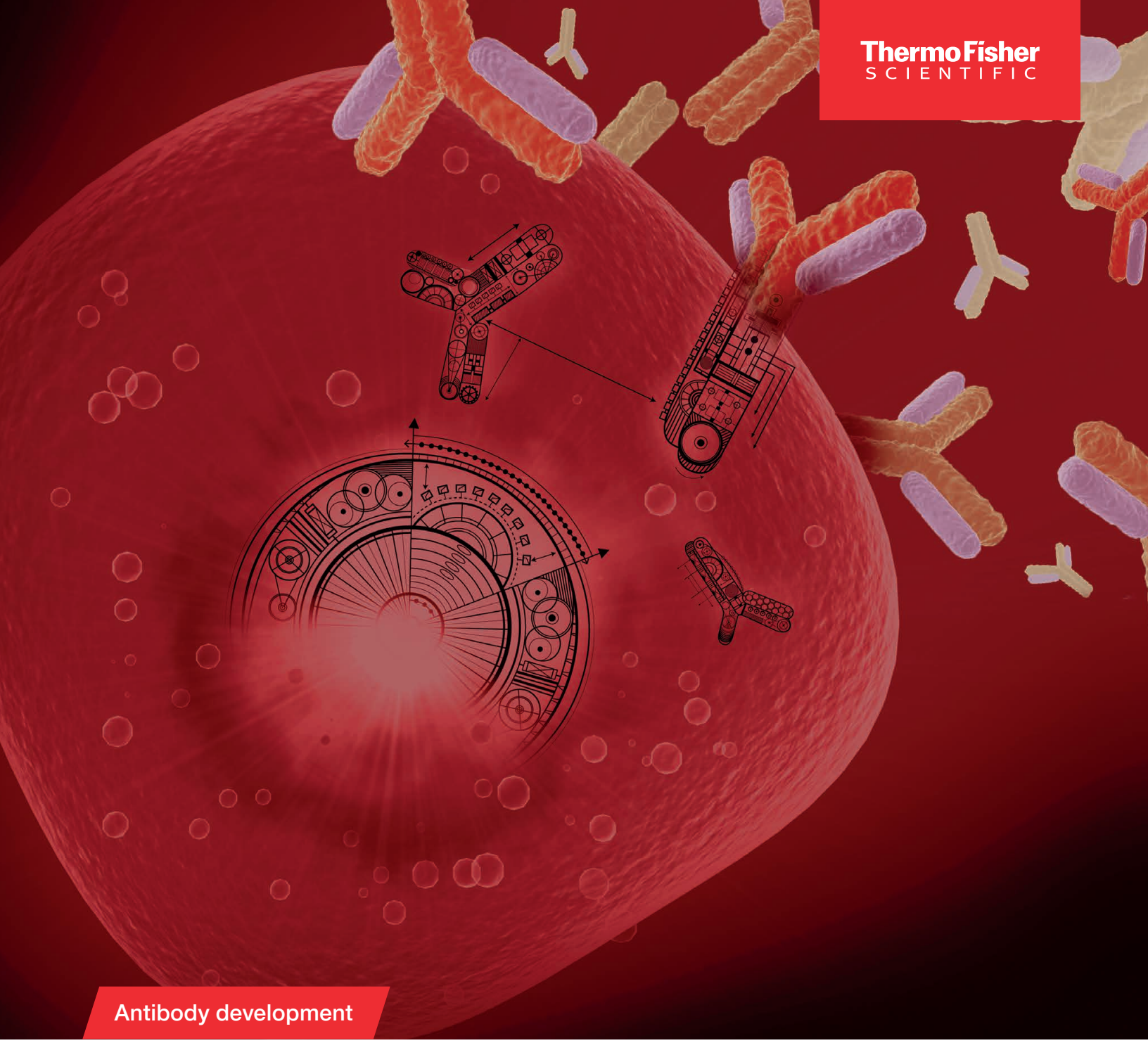


Antibody development

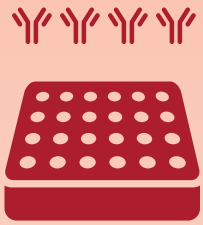
Services for antibody engineering

Supporting antibody optimization from high-throughput to scale-up studies

invitrogen

Throughput and scale

HTP



Mid-scale



Large-scale



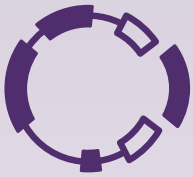
Gene synthesis and cloning



Invitrogen™ GeneArt™ HTP Strings™ DNA Fragments

Designed to integrate into your high-throughput (HTP) cloning workflow, these DNA fragments are normalized to enhance cloning efficiency and streamline the generation of expression constructs for antibody screening. Available in lengths of 200–475 bp, these fragments are an excellent choice for the variable regions of antibody constructs.

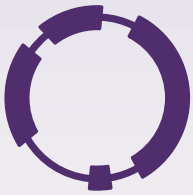
thermofisher.com/htpdna



Molecular cloning essentials

To support your in-house cloning workflow with Invitrogen™ GeneArt™ Strings™ DNA Fragments, we offer advanced product options like Invitrogen™ Gateway™ recombination technology Invitrogen™ GeneArt™ Gibson Assembly™ cloning kits. A variety of competent cell strains are available in multiple ready-to-use formats to match your priorities and throughput needs.

thermofisher.com/cloning



Gene synthesis and cloning service

Choose from an ever-expanding list of direct cloning vectors for fast delivery of your gene in a finished plasmid. Subcloning and vector onboarding are also available for maximum customization.

thermofisher.com/genesynthesis

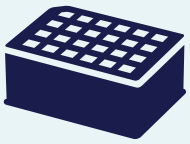


Plasmid purification

Scale up to microgram or milligram amounts of ready-to-use plasmid with extremely low levels of endotoxin.

thermofisher.com/geneartplasmid

Protein expression and purification



HTP antibody expression service

Rely on this small-scale HTP antibody expression service with consistent expression and recovery for early-stage testing of your candidate designs. Supernatant or one-step protein A/G purification is available with customizable delivery and analysis options for mAbs or antibody derivatives.

thermofisher.com/HTPantibodies



Express antibody service

Get custom human IgG antibodies expressed in human or CHO cells and protein A purified in 12–13 business days. This rapid production service is available for 35–250 mL culture scales and an excellent choice when you need quick answers for your research.

thermofisher.com/fastab



Protein expression service and systems

Increase efficiency by entrusting our protein expression team with your antibody production and purification while you focus on your innovative research. Offering transient expression in culture volumes of 2.5 mL to over 25 mL, our team has experience producing complex antibodies and antibody derivatives.

thermofisher.com/genetoprotein

An exceptional advantage of using Invitrogen™ GeneArt™ Protein Expression Services is our use of advanced Gibco™ ExpiCHO™, Expi293™, and Expi293™ PRO Expression Systems, which are also commercially available. This enables you to shift easily between in-house and outsourced protein expression with exceptional consistency.

thermofisher.com/expi



Antibody conjugation services

The Thermo Fisher Scientific custom conjugation services team can provide high-quality basic or advanced conjugates. Services include standard conjugation, site-specific conjugation, bispecific conjugation, and 1:1 antibody conjugation.

thermofisher.com/proteinlabeling

Antibody vectors

Boost workflow efficiency by choosing vectors that already contain mAb constant regions.

Select from the following with sequences optimized for expression in either CHO cells or human cells:

- Human IgG1 heavy chain
- Human IgG4 heavy chain
- Human Ig kappa light chain
- Human Ig lambda light chain
- Mouse IgG1 heavy chain
- Mouse IgG2a heavy chain
- Mouse IgG2b heavy chain
- Mouse Ig kappa light chain
- Mouse Ig lambda light chain
- Rat IgG1 heavy chain
- Rat IgG2a heavy chain
- Rat IgG2b heavy chain
- Rat Ig kappa light chain
- Rabbit IgG heavy chain
- Rabbit Ig kappa light chain

Alternatively, onboard your own custom vector for use in your current and future projects.

Explore vector options:
thermofisher.com/genesynthesisvectors

Innovations to drive efficiency

Increase protein yields with sequence optimization

One of the advantages of starting with *de novo* gene synthesis is the ability to optimize the coding sequence for more efficient expression. Submitted protein sequences are assessed using the proprietary Invitrogen™ GeneArt™ GeneOptimizer™ algorithm to generate a DNA sequence matched to the expression system for better efficiency. In addition to codon optimization, over 20 parameters are considered to improve transcription, mRNA stability, and translation.

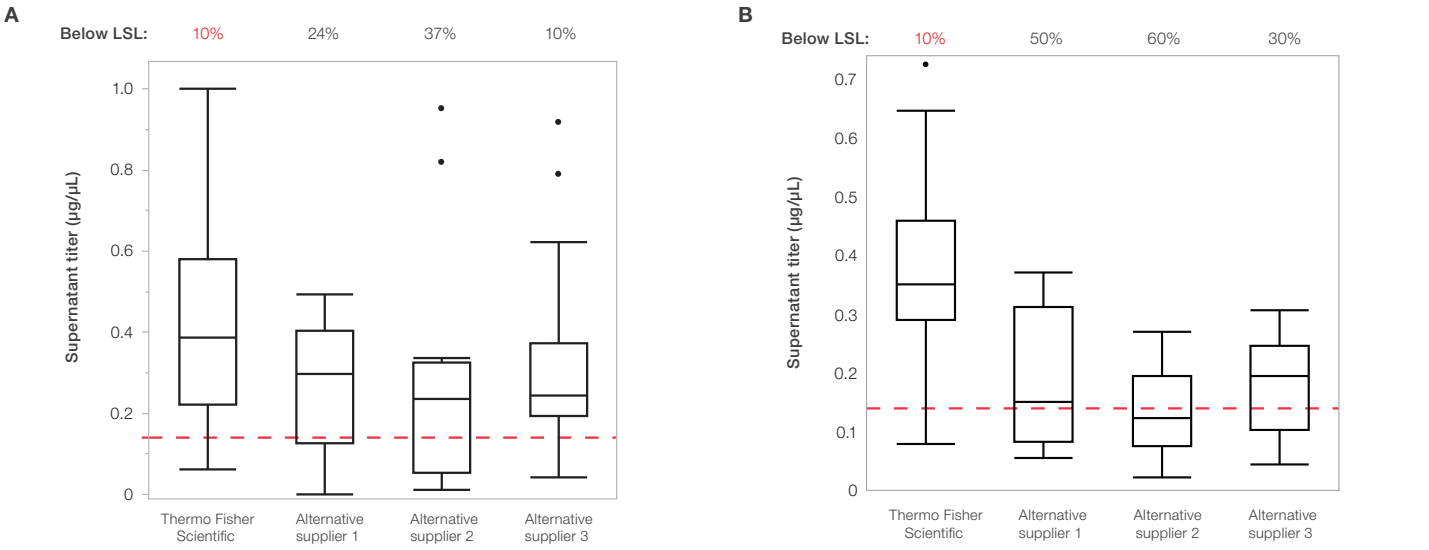


Figure 1. The GeneArt GeneOptimizer algorithm gives rise to higher titers in antibody supernatants than competitor codon optimization algorithms. A set of 10 antibody sequences was optimized with the GeneArt GeneOptimizer algorithm or one of three competitor algorithms. All constructs were transfected and expressed for **(A)** 7 days using the Expi293 Expression System or **(B)** 10 days using the ExpiCHO Expression System. Supernatant titers were measured in duplicate by biolayer interferometry (BLI). Lower specification limit (LSL—red dashed line) is the minimum titer needed for multiple downstream assays.

Next-generation protein expression

Antibody expression services are now available using the Expi293 PRO Expression System for exceptional protein yield and speed. Fast expression kinetics enable early harvest without sacrificing yield.

Learn more at thermofisher.com/expi293pro-services

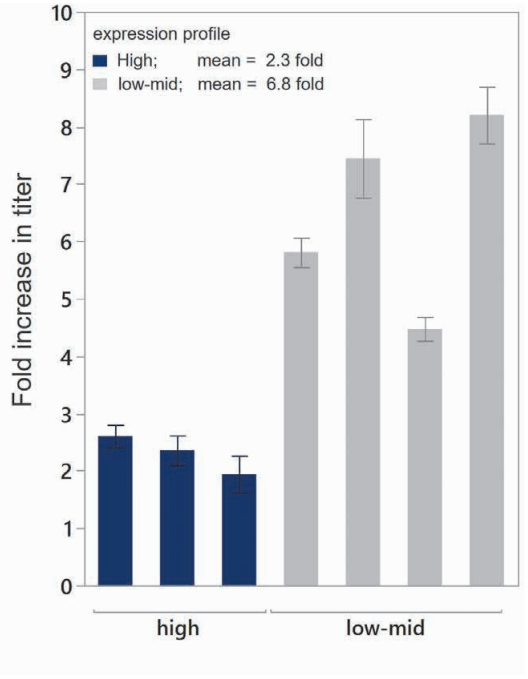
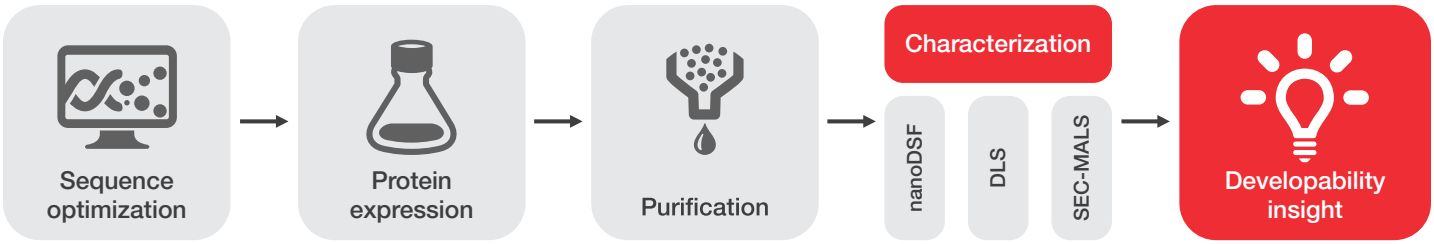


Figure 2. Increase in supernatant titer for seven antibodies expressed with the Expi293 PRO system compared to the Expi293 system. Antibodies are categorized by relative expression profile (low-mid vs. high).

Accelerate your antibody engineering workflow



From sequence optimization to developability insight, we help antibody discovery and protein engineering teams move candidates forward fast with integrated services designed for speed, quality, and scalability.

End-to-end workflow support

Sequence optimization

Improve expression and reduce sequence complexity for efficient DNA synthesis.

Protein expression

Rapid transient protein expression of antibodies, fragments, bispecifics, and engineered formats in HEK or CHO cells.

Purification

High-quality purification workflows designed to enable screening-ready material with high purity and low aggregation.

Characterization

Generate actionable developability data with:

- nano–differential scanning fluorimetry (nanoDSF)
- Dynamic light scattering (DLS)
- Size exclusion chromatography with multi-angle light scattering (SEC MALS)

Built for antibody discovery and engineering teams

Whether you need overflow capacity or an integrated workflow collaborator, we help accelerate design–test cycles without adding operational burden.

Why teams collaborate with us

- Fast turnaround times
- Antibody-specific experience
- Flexible project scale
- Scientist-to-scientist support
- Transparent QC and communication
- Scalable from discovery through development

Service	HTP antibody service	Express antibody service	Standard protein service
Protein amount	100 µg–3 mg	10–200 mg	10 mg to >1 g
Protein type	Antibodies and antibody derivatives; up to 4 chain co-expression	Human IgG	Standard to complex antibodies and antibody derivatives; other proteins
Expression system	ExpiCHO, Expi293, Expi293 PRO systems		
Purification	• One-step protein A/G • Expression-only option	One-step protein A	• One-step or multi-step purification for secreted proteins • Expression-only option for secreted or cellular proteins • Customizable to your protocol
QC and characterization	**Standard** • Analytical SEC (purity) • UV/vis (yield) • BLI (titer; for expression-only proteins) **Optional** • CE-SDS (non-reducing) • BLI (titer; for purified proteins) • NanoDSF • DLS • SEC MALS	**Standard** • Analytical SEC (purity) • UV/vis (yield)	**Standard** • Analytical SEC (purity) • UV/vis (yield) • SDS-PAGE (reducing) • Western blot (reducing)* **Optional** • Endotoxin determination • SDS-PAGE (non-reducing) • CE-SDS (reducing/non-reducing) • Western blot (reducing/non-reducing)** • Freeze-thaw stability analysis • Titer determination • NanoDSF • DLS • SEC MALS
Delivery format	• 1 mL Thermo Scientific™ Matrix™ tubes (default) • 96 deep-well plates, 1 mL per well • 1 mL Azenta™ FluidX™ tubes	Bulk in 15 mL tube	• Up to 75 x 2 mL aliquots, remainder bulk; frozen (default) • Non-frozen • Variable aliquot volume
Documentation	• Product information sheet (CSV and PDF) • SEC chromatograms (PDF) upon request • CE-SDS electropherograms (PDF) upon request	• Basic product information sheet (PDF)	• Product information sheet (PDF)
Flexibility of service options	++	-	+++
Production time	Starting at 15 business days	Starting at 12 business days	Starting at 15 business days

* For non-antibodies and expression-only services

** For antibodies and antibody-like molecules only

Note: SEC, size exclusion chromatography; CE-SDS, capillary electrophoresis sodium dodecyl sulfate.

Accelerate antibody optimization at
thermofisher.com/antibodyservices

invitrogen

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