Streamline viral vector and vaccine development

With high performance Gibco™ products and services

gibco

Contents

Accelerate your viral vector and vaccine development and streamline manufacturing with Gibco high-performance media, supplements, services, and support. Our extensive, cutting-edge portfolio of products and services can optimize your workflow, while minimizing risk and improving cost effectiveness. Whether you are developing viral vectors for innovative gene therapies or new vaccines for emerging infectious diseases, we can help ensure your development goals are met.

We have a longstanding history of innovation, including more than 60 years helping our customers bring vaccines to market. Throughout that time we have pioneered the development of serum-reduced and serum-free vaccine media to reduce the risks of animal origin (AO) contaminants and process variability. This experience, combined with unrivaled quality systems and robust analytical services, puts our team in a position to uniquely support your viral vector and vaccine production needs. Finally, our global infrastructure with multiple qualified and equivalent manufacturing facilities and strong quality standards—including strict raw material controls—means you can rely on receiving a consistent supply of high-quality products for your viral vector and vaccine workflows.

Explore our diverse range of Gibco media, feeds, supplements, and services specifically tailored to your viral vector and vaccine cell line and process development needs.

If you want to know more about which Gibco medium is tailored for use with your specific cell line and process, please search our offerings based on cell type on page 17.

Why come to us for your viral vector and vaccine development solutions?

Looking to reduce animal origin source component risks?

Consider using serum-reduced or serum-free products.

Concerns associated with rising serum costs, supply instability, lot-to-lot consistency, and safety may be leading you to look for a way to reduce or eliminate your serum usage. With the potential to ease the regulatory approval process, reducing or removing serum may be the preferred option for your process. ***Discover our serum-reduced and serum-free product options.***

Want to streamline production and reduce costs?

Consider a format change.

Our Gibco™ Advanced Granulation Technology (AGT™) format can boost productivity by streamlining your workflow and reducing total costs, while also reducing storage space requirements when compared to liquids. ***Learn how AGT can help improve the productivity of your workflow.***

Acronym list:

Name	Acronym
Animal origin	AO
Animal origin–free	AOF
Chemically defined	CD
Protein free	PF
Serum free	SF
Serum reduced	SR

Vaccine type key:

- Whole-virus vaccines
- Viral vectors
- Chimeric vaccines
- Virus-like particles (VLPs)
- Subunit and toxoid vaccines
- DNA/RNA vaccines

Media

Are you looking for a specific medium or do you want to optimize your medium to improve your workflow?

Learn more about our innovative high-performance media, including Gibco™ Bacto CD Supreme, the first chemically defined microbial media. Or, our cutting edge Gibco AGT dry format media to streamline production scale up and reduce total costs. In addition, by pioneering the use of serum-free media for vaccine and viral vector applications we can help you reduce risks from variable animal origin components and global serum supply issues.

Gibco high-performance media can offer solutions for your vaccine, cell line, or process. Discover the Gibco medium that can streamline your viral vector or vaccine development.

Gibco™ Opti-MEM™ Reduced Serum Medium

An improved Minimal Essential Medium (MEM) that allows for a reduction of fetal bovine serum (FBS) supplementation by at least 50%, with no change in cell growth rate or morphology.

- Contains insulin, transferrin, hypoxanthine, thymidine, and trace elements
- Uses a sodium bicarbonate buffer system (2.4 g/L), and therefore requires a 5–10% CO_2 environment to maintain physiological pH

Cell lines:	Sp2, AE-1, CHO, BHK-21, HEK293, and primary fibroblasts
Classification:	CD, low protein, SR
Culture type:	Adherent or suspension
Available formats:	Custom liquid and dry powder

Compatibility
Whole-virus vaccines
Viral vectors
Chimeric vaccines
VLPs
Subunit and toxoid vaccines

Media

Gibco™ Vaccine Production Serum-Free Medium (VP-SFM)

Specifically designed to enhance the growth of Vero cells for virus production. Also suitable for use with COS-7, MDCK, BHK-21, and Hep-2 cultures for recombinant protein production.

- Excellent performance—supporting high cell densities and titers
- Minimal adaptation necessary, with streamlined transition to serum-free production
- Provides comparable performance in vaccine applications to serum-supplemented media
- Ideal for adherent and microcarrier use

Cell lines:	Vero, MDCK, Hep2, BHK-21, COS-7
Classification:	AOF, ultra-low protein (5 µg/ml), SF
Culture type:	Adherent
Available formats:	Liquid and AGT format

Compatibility

- Whole-virus vaccines
- Viral vectors
- Chimeric vaccines

Gibco™ CD BHK-21 Production Medium

Specifically designed to support the growth of BHK-21 cells in serum-free suspension culture for large-scale manufacturing applications.

- Superior cell growth performance and consistent antigen yields
- Simplified transition to serum-free with higher titers and streamlined scale-up for upstream process development and downstream purification
- The first cell culture medium supporting complete serum-free and protein-free processes for BHK-21 cells, and the only product of its kind on the market

Cell lines:	BHK-21
Classification:	CD, PF, SF
Culture type:	Suspension
Available formats:	Dry powder

Compatibility

- Whole-virus vaccines
- Viral vectors
- Chimeric vaccines

Media

Gibco™ Sf-900™ III SFM

Optimized for the growth and maintenance of *Spodoptera frugiperda* (Sf9 and Sf21) cells and for recombinant gene expression using baculovirus and stable insect expression systems.

- Superior long-term, high-density (maximum cell densities of 10–14 x 10^6 cells/mL) growth and protein production
- Improved lot-to-lot consistency
- Designed for high performance and high yield using commercially available Sf9 and Sf21 cells

Cell lines:	Sf9, Sf21
Classification:	AOF, PF, low hydrolysate, SF
Culture type:	Suspension
Available formats:	Custom dry powder

Compatibility

- Viral vectors
- VLPs
- Subunit and toxoid vaccines

Gibco™ OptiPRO™ SFM

Specifically designed for the culture of kidney-derived cells with minimal adaptation for virus or recombinant protein production

- Excellent performance—supports high cell densities, titers, and streamlined transition to serum-free production
- Formulated with a very low protein concentration (< 10 µg/ml), allowing for easier purification of your recombinant protein
- Ideal for adherent and microcarrier use

Cell lines:	HeLa, MDCK, BHK-21, PK-15, COS-7, MDBK, Vero
Classification:	AOF, low protein, SF
Culture type:	Adherent
Available formats:	Liquid and AGT format

Compatibility

- Whole-virus vaccines
- Chimeric vaccines

Media

Gibco™ CD 293

Optimized for the growth of suspension cultures of HEK293 cells with no proteins or peptides of animal, plant, or synthetic origin.

- Eliminates the risks associated with serum while offering lower costs
- No undefined hydrolysates in the formulation
- Formulated without L-glutamine for increased stability

Cell lines:	HEK293
Classification:	AOF, CD, PF, SF
Culture type:	Suspension
Available formats:	Liquid and AGT format

Compatibility

- Viral vectors
- Chimeric vaccines
- VLPs
- Subunit and toxoid vaccines

Gibco™ Diploid Serum-Reduced Medium System

A specially designed serum-reduced system composed of two media (Gibco Diploid Growth Serum-Reduced Medium and Gibco Diploid Production Serum-Free Medium) optimized to enhance cell growth and virus production.

- Supports vaccine manufacture under serum-reduced or serum-free conditions, with no adaptation required
- Maintains viral titers and reduces risk from AO components, while also minimizing bioproduction costs associated with serum
- Supports chicken embryo fibroblasts (CEF) and human diploid cells in the production of chimeric vaccines and whole virus vaccines

Cell lines:	MRC-5, WI-38, KMB17, 2BS, CEF
Classification:	SR
Culture type:	Adherent
Available formats:	Dry powder and custom liquid

Compatibility

- Whole-virus vaccines
- Chimeric vaccines

Media

Gibco™ FreeStyle™ F17 Expression Medium

Developed to support the growth and transfection of HEK293 cells in suspension.

- Little to no adaptation required when transitioning from other serum-free media or when using cells in suspension
- Compatible with multiple transient production systems
- Scalability in spinner flasks and bioreactors

Cell lines:	FreeStyle™ 293-F cells, CHO, HEK293
Classification:	AOF, CD, PF, SF
Culture type:	Suspension
Available formats:	Liquid

Compatibility

- Viral vectors
- VLPs
- Subunit and toxoid vaccines

Gibco™ Dynamis™ Medium

Specifically designed to offer the highest batch and fed-batch performance and yield with recombinant CHO cells in a CD environment. It also has been shown to support robust growth of HEK293 cells for adenovirus production.

- Achieves higher and longer sustained cell densities compared to other market offerings
- Enables faster process development and streamlined, or simplified, transfer to manufacturing scale
- Designed for use with transfected CHO-K1, CHO-GS, CHO-S, or HEK293 cell lines

Cell lines:	CHO-DG44, CHO-S, CHO-K1, GS-CHO, HEK293
Classification:	AOF, CD, PF, SF
Culture type:	Suspension
Available formats:	Liquid and AGT format

Compatibility

- Subunit and toxoid vaccines

Media

Gibco™ ExpiCHO™ Stable Production Medium

Specifically designed to simplify your cell line development process into production with minimal effort and a high degree of confidence.

- Supports consistency, product quality, and scalability for large-scale bioproduction
- Easy transition from transient to stable production clones

Cell lines:	ExpiCHO-S
Classification:	AOF, CD, PF
Culture type:	Suspension
Available formats:	Liquid and AGT format

Compatibility

- Subunit and toxoid vaccines

Gibco™ Bacto™ CD Supreme Fermentation Production Medium

Designed specifically for fermentation applications to support high cell density cultures utilizing *Escherichia coli* for recombinant protein or plasmid production.

- Reduced variability with CD formulation
- Eliminates the need to source traditional AO or AOF hydrolysates
- Reduces regulatory burden and risk of viral contamination
- One-part fermentation media increases productivity, saving time on weighing and blending
- Flexible sterilization methods allow the media to be filter sterilized or autoclaved

Cell lines:	*Escherichia coli*—multiple strains including BL21, DH5a, DH10b, DH-1, Stbl2, Stbl3, and TOP10
Classification:	CD
Culture type:	Microbial
Available formats:	Dry powder

Compatibility

- Whole-virus vaccines
- Viral vectors
- Subunit and toxoid vaccines
- DNA/RNA vaccines

Media

Gibco™ Viral Vector HEK Media Panel

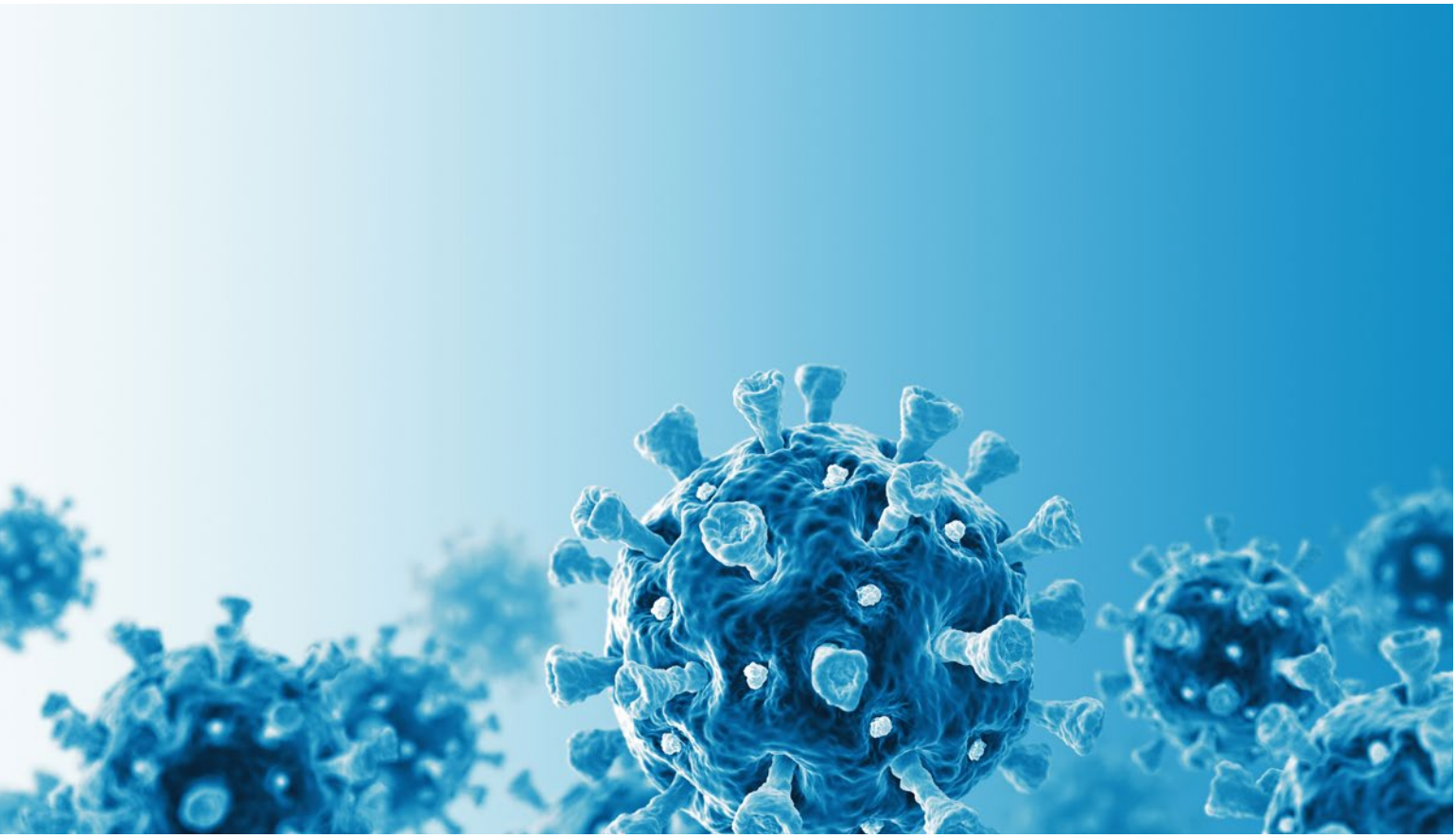
A diverse media library to accelerate adeno-associated virus production. The ready-to-use formulations—which cover a broad variety of HEK293 cells lines and are not tied to specific transfection reagents or techniques—will help you identify an optimal medium for your target cell line.

- Simplicity—ready-to-use formulations
- Diversity—distinct formulations to match each cell lineage's nutritional requirements
- Productivity—improved titers over industry standard

Cell lines:	HEK293
Classification:	CD, PF
Culture type:	Suspension
Available formats:	Liquid and AGT format

Compatibility

Viral vectors



Feeds and supplements

We have several diverse feeds and supplements that can be leveraged to support your vaccine development.

From Gibco peptones—a versatile supplement to help support vaccine production—to Gibco TrypLE™ Select Enzyme, an easy-to-use, room-temperature-stable alternative to trypsin, the Gibco feeds and supplements portfolio can accelerate your workflow. Learn more about how our offering can support your development goals.

Gibco™ EfficientFeed+ Supplements

Overcome traditional solubility limitations impacting total bioreactor working volume with Gibco EfficientFeed™ A+, B+, and C+ Supplements, which deliver super-concentrated nutrients in complete, ready-to-use liquid or easy-to-prepare dry format.

- Achieve 2- to 5-fold increases over batch culture
- Reach higher titers using super concentration flexibility
- Reduce product dilution to maximize working volume
- Reduce feed volume for less dilution and maximum working volume

Available formats:	Concentrated liquid and AGT format

Features	
✓	Easy-to-use
✓	Provides improved productivity
✓	Flexible

Feeds and supplements

Gibco™ peptones

Nutrient-rich protein hydrolysates suitable for use as a medium in bacterial cultures or as a supplement with mammalian cell types.

- Improve protein quality and product titers while requiring only a minimal basal medium (buffer + salt) and one additional carbon source
- Optimizes production by reducing the need for serum—driving down costs and risk factors
- Tailored peptone schemes—available through screening and key driver analysis —can also reduce costs and enhance process performance

Available formats:	Dry powder

Features	
✓	Versatile
✓	Suitable as a medium for whole virus, chimeric, VLP, DNA/RNA, subunit, and viral vector vaccine types
✓	AO or AOF
✓	For use in adherent, suspension, or microbial cultures

Gibco™ Sera for Bioprocessing

Thermo Fisher Scientific is a proven supplier of quality fetal bovine sera (FBS) and other animal sera in cell culture to help meet biopharmaceutical manufacturing requirements.

- An extremely effective growth supplement, used in vaccine production for 60 years
- Gibco sera is the most cited sera in global scientific journals and used by 14 of the top 15 pharmaceutical companies
- Thermo Fisher has added measures—such as origin tracing and proprietary screening for BVDV—to help ensure the integrity of its FBS products
- Customization and best-in-class technical & analytical support

Features	
✓	cGMP complaint manufacturing process
✓	ISO certified
✓	ISIA traceability certified
✓	Processed to minimize risk of viral contamination

Gibco™ GlutaMAX™ Supplement

An alternative to L-glutamine, with increased stability to improve cell health. Suitable for both adherent and suspension cultures of mammalian cells with no adaptation required.

- Minimizes toxic ammonia build-up
- Improves cell viability and growth
- Remains stable across a wide range of temperatures

Features	
✓	AOF
✓	Convenient storage and handling

Feeds and supplements

Gibco™ AlbuMAX™

A convenient and effective means to reduce or replace the requirement for serum supplementation in cell culture media. Produced from a proprietary purification process that preserves greater BSA activity.

- Available as high lipid and low lipid formulations to meet specific customer needs
- Reduces customer dependence on serum
- Mitigates exposure to risk of fluctuating serum prices

Features	
✓	NZ sourced
✓	Helps eliminate serum
✓	High performance
✓	Cost effective

Gibco™ TrypLE™ Select Enzyme

AOF (non-porcine origin) trypsin-like recombinant enzyme for dissociating a wide range of adherent mammalian cells, including CHO, HEK293, A529, primary human keratinocytes, and embryonic stem cells.

- Gentle on cells—maintains cell health for reproducible results
- Easy to use—substitutes directly into existing protocols, with no inactivation required
- Room-temperature stable—convenient to use while reducing footprint on freezer space

Features	
✓	Easy storage
✓	AOF
✓	Comparable performance to trypsin

Gibco™ Defined Trypsin Inhibitor

AOF solution recommended for quenching trypsin and TrypLE activity in serum-free cell cultures.

- Supports cell health for reproducible results with adherent, serum-free cultures
- Purified soybean trypsin inhibitor can be used at 1X or 2X

Features	
✓	AOF

Feeds and supplements

Gibco™ Transferrin

Promotes cell growth in a variety of applications and formulations. The perfect combination, with insulin and other supporting reagents, to reduce or eliminate serum from a vaccine process.

- Ability to eliminate serum
- Excellent companion for Gibco AlbuMAX
- A necessary supplement for serum-free cultures in conjunction with insulin and trace metals

Features	
✓	NZ sourced
✓	Eliminate serum
✓	Lower cost

Gibco™ Recombinant AOF Insulin

High quality AOF insulin to meet your needs from validation to scale-up. As the exclusive supplier of Biocon insulin for cell culture applications, Thermo Fisher offers it as a raw material or blended with your custom media formulations.

- Available in 1 and 5 g sample sizes from multiple lots to simplify validation, and a variety of larger pack sizes to meet larger scale demands
- The only tertiary AOF insulin available on the market
- Value priced up to 50% less than major competitors
- Meets and exceeds competitive insulin product performance in cell culture growth assays

Features	
✓	A wide range of product sizes
✓	No compromises on performance

Gibco™ BSA Fraction V

Produced from a proprietary purification process that preserves greater BSA activity. Also available as low IgG formulation to meet specific customer needs.

- Ability to eliminate or reduce serum
- Mitigates exposure to the risk of fluctuating serum prices

Features	
✓	NZ sourced
✓	Eliminate serum
✓	High performance
✓	Cost effective

Services

We offer leading services that can help improve your workflow, no matter the scale or scope.

From pilot-scale testing using our Gibco Rapid Prototyping Service to our large-scale cGMP media manufacturing services, your diverse viral vector and vaccine development goals can be met.

1.

Gibco™ PD-Express Services

A portfolio of customizable process development options to help you achieve your objectives and get to market quickly. Our streamlined solutions can help reduce risk, save time, and cost while enhancing productivity, scalability, and product quality.

Services include:

- Cell line development
- Catalog media evaluations
- Media panel evaluations
- Media development
- Bioproduction analytics

2.

Gibco™ Rapid Prototyping Service

Accelerate media development and scale up with fast, non-cGMP, custom media manufacturing at pilot scale. Test the manufacturability and scalability of your formulation or modify existing formulations by adding novel components or reducing components not driving cell culture performance.

Features include:

- cGMP-quality raw materials and processes for easy transfer to cGMP scale
- Liquid, DPM, and AGT formats—available with batches up to 200 L or 10 kg (DPM)
- Rapid lead times—standard orders are typically shipped within 10–20 working days

3.

cGMP Media Manufacturing Services

Outsource the manufacturing of your own media formulation and benefit from supply assurance, consistent quality, harmonized facilities, and our global site equivalency.

Features include:

- Large-scale, cGMP manufacturing for clinical or commercial applications
- Mammalian or microbial platform compatibility, with multiple formats available (liquid, liquid concentrates, DPM, and our proprietary AGT) and customization options including packaging and QC testing
- Short lead time target, with competitive pricing and best-in-class service

**Subject to change and dependent on complexity.*

Can't find the perfect fit for your process?

All of the products listed within this brochure are also available as customized products.

Other customization options include:

- QC Testing
- Formats
- Packaging
- Manufacturing

Contact us to discuss how to customize our products and services to meet your unique vaccine and viral vector development needs.

Looking for a Gibco medium that will work with your cell line?

Search for compatible media by cell line to streamline your process.

Cell line	Tissue and type	Culture type	Compatible Gibco media
2BS	Human—lung fibroblast	Adherent	• Gibco Diploid Growth Serum-Reduced Medium
BGM	Green monkey—kidney	Adherent	• Gibco VP-SFM • Gibco OptiPRO SFM
BHK-21	Hamster—kidney	Either	• Gibco VP-SFM • Gibco OptiPRO SFM • CD BHK-21 Production Medium
CEF	Chicken embryo—fibroblast	Adherent	• Gibco Diploid Growth Serum-Reduced Medium
CHO DG44	Hamster—ovary	Either	• Gibco Dynamis Medium
CHO-K1	Hamster—ovary	Either	• Gibco Dynamis Medium
CHO-S	Hamster—ovary	Suspension	• Gibco Dynamis Medium
COS-7	Green monkey—kidney	Adherent	• Gibco VP-SFM • Gibco OptiPRO SFM
***Escherichia coli*—multiple strains including BL21, DH5a, DH10b, DH-1, Stbl2, Stbl3, and TOP10**	Bacterial	Microbial	• Bacto CD Supreme
ExpiCHO-S	Hamster—ovary	Suspension	• Gibco ExpiCHO Stable Production Medium
ExpiSf9	Insect—ovary	Suspension	• Gibco ExpiSf CD Medium
FRhK-4	Rhesus macaque—kidney	Adherent	• Gibco OptiPRO SFMM
FreeStyle 293-F cells	Human—kidney	Suspension	• Gibco FreeStyle F17 Expression Medium
GS-CHO	Hamster—ovary	Suspension	• Gibco Dynamis Medium
HEK293	Human—kidney	Either	• Gibco CD 293 • Gibco Dynamis Medium • Gibco FreeStyle F17 Expression • Gibco Viral Vector HEK Media Panelm
HeLa	Human—cervix	Adherent	• Gibco OptiPRO SFM
Hep2	Human—epithelial	Adherent	• Gibco VP-SFM

Media by cell line

Cell line	Tissue and type	Culture type	Compatible Gibco media
KMB17	Human—lung	Adherent	• Gibco Diploid Growth Serum-Reduced Medium
MDBK	Bovine—kidney	Adherent	• Gibco OptiPRO SFM
MDCK	Canine—kidney	Adherent	• Gibco OptiPRO SFM • Gibco VP-SFM
MRC-5	Human—lung fibroblast	Adherent	• Gibco Diploid Growth Serum-Reduced Medium
PG13	Mouse— fibroblast	Adherent	• Gibco Diploid Growth Serum-Reduced Medium
PK-15	Porcine—kidney	Adherent	• Gibco OptiPRO SFM
Sf9	Insect—ovary	Suspension	• Gibco Sf-900 III SFM • Gibco ExpiSf CD Medium
Sf21	Insect—other	Either	• Gibco Sf-900 III SFM • Gibco ExpiSf CD Medium
VERO	Green monkey—kidney	Adherent	• Gibco VP-SFM • Gibco OptiPRO SFM
WI-38	Human—lung fibroblast	Adherent	• Gibco Diploid Growth Serum-Reduced Medium

Find out more at **thermofisher.com/vaccineproduction**