

Enhance Serum-Free Virus Production with GIBCO® Media

- Performance equivalent or superior to serum-supplemented systems
- Low protein formulations simplify downstream purification
- Animal-origin-free products minimize risk
- Convenient pre-adapted COS-7L cells save time
- Custom products and packaging available
- Easy to scale up to large volume cultures

Product	Optimized For	Applications
 VP-SFM† Low-protein < 10µg/ml.	Suspension BHK-21 cells Adherent VERO, COS-7L, MDCK, HEp-2	For culture of kidney epithelial and related cells used in virus production.
 VP-SFM AGT™† Dry granular format of VP-SFM		
 OptiPro™ SFM† Low-protein < 10µg/ml.	Adherent MDCK, VERO, PK-15, MDBK, BHK-21	For culture of kidney epithelial and related cells used in virus production.
COS-7L Cells, Adapted to VP-SFM		

 Serum-Free Media
  Pre-Adapted Cells
  Animal-Origin-Free Product

† Drug Master File available

Note: Cell lines from different sources, and different clones of the same cell line, may have highly specific nutritional requirements and may therefore prefer one medium over another. More than one medium formulation (if available) should be evaluated to determine the best option.

OptiPro™ SFM for Multiple Cell Lines

Low Protein Formulation

GIBCO® OptiPro™ SFM is designed for the cultivation of mammalian cell lines for virus production and recombinant protein production. Its low protein concentration (< 10 µg/ml) simplifies downstream purification.

OptiPro™ SFM sustains the growth of a broad range of kidney epithelial cell lines at levels equal to or better than serum-supplemented and other serum-free formulations. It has demonstrated production of viruses to high titer in kidney-derived cell lines including BHK-21, MDCK, MDBK, and PK-15. It is also suitable for the growth of COS-7 and HeLa cell lines.

OptiPro™ SFM is the only animal-origin-free, serum-free medium that does not require the addition of attachment proteins or pre-treatment of surfaces for attached growth. It is formulated without L-glutamine, providing added stability.

Growth of Cells and Virus in OptiPro™ SFM

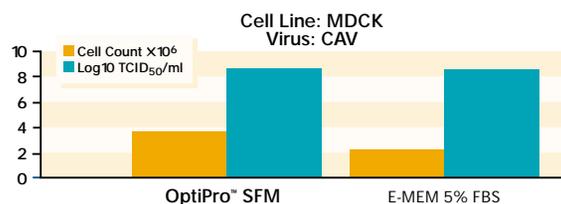


Figure 1. Cultures carried for 4 subcultures in respective media. Counts represent the average/flask × 10⁶. Titer of inoculum was 5 × 10⁵ TCID₅₀/ml. Inoculated at 0.1 ml virus/10 cells. Length of incubation dictated by % CPE in serum control.

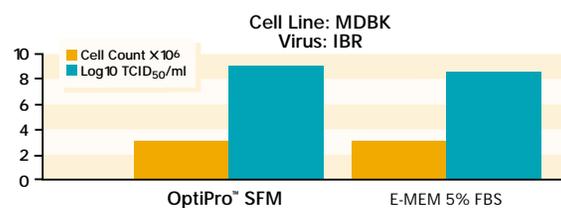


Figure 2. Cultures carried for 6 subcultures in respective media. Counts represent the average/flask × 10⁶. Titer of inoculum was 1.3 × 10⁸ TCID₅₀/ml. Inoculated at 0.1 ml virus/10 cells. Length of incubation dictated by % CPE in serum control.

SFM Serum-Free Media

GIBCO® Serum-Free Media do not require supplementation with serum, but may contain discrete proteins or bulk protein fractions.

PFM Protein-Free Media

GIBCO® Protein-Free Media contain no proteins, but may contain plant or yeast hydrolysates. Many are animal-origin-free.

CDM Chemically-Defined Media

GIBCO® Chemically-Defined Media contain no proteins, hydrolysates, or components of unknown composition. These media are animal-origin-free and all components have a known chemical structure.

- Completely defined system eliminates variability
- Consistent performance improves reproducibility
- Decrease possibility of contamination by adventitious agents
- Save time with simplified purification and downstream processing

VP-SFM

Low Protein Formulation

VP-SFM is designed specifically for the culture of VERO cells, but is also suitable for the growth of COS-7, MDCK, BHK-21, and HEp-2 cell lines. It is particularly suitable for growing viruses, as well as for producing recombinant proteins and monoclonal antibodies. Its low protein concentration ($\leq 10 \mu\text{g/ml}$) simplifies downstream purification.

Most serum-free media that contain trace proteins are derived from transferrin or albumin. VP-SFM has an iron chelate providing the transferrin function and a plant hydrolysate that contributes low molecular weight peptides.

Many cell lines, such as VERO, BHK, and HEp-2, require no adaptation to VP-SFM; however, some cells may require sequential adaptation. This medium is formulated without L-glutamine, providing added stability.

VP-SFM is available in a ready-to-use (1X) liquid format and in a new, easy-to-use granular format Advanced Granulation Technology™ (AGT™). AGT™ Media are complete, pH pre-adjusted and require only standard supplementation with L-glutamine or GlutaMAX™-I Supplement for L-glutamine-dependent systems. AGT™ media can help to reduce total cycle costs, decreasing time involved in raw material planning, procurement, and testing, as well as media preparation.

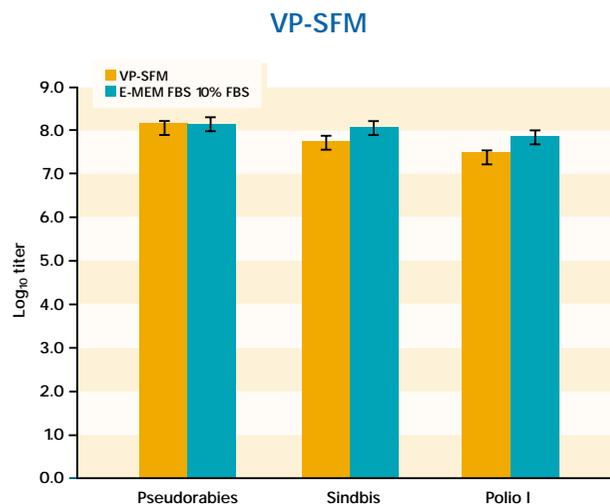


Figure 3. Virus titration results in VERO cells. Virus production in triplicate plates using VERO cells grown in either VP-SFM or E-MEM with 10% FBS.

VP-SFM Growth Studies

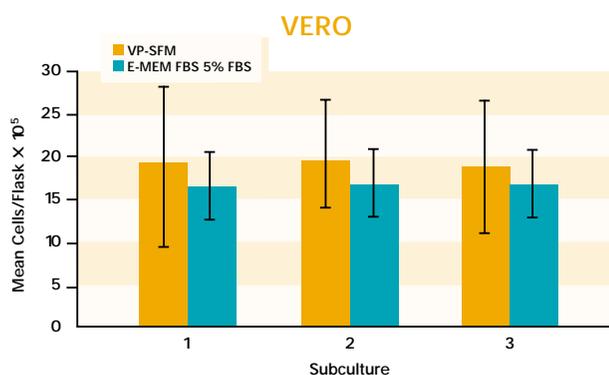


Figure 4. VERO cell growth comparison. VERO cells were passaged every 4 days for 3 subcultures at 2.5×10^5 cells/25 cm² plastic flask in VP-SFM or E-MEM with 5% FBS.

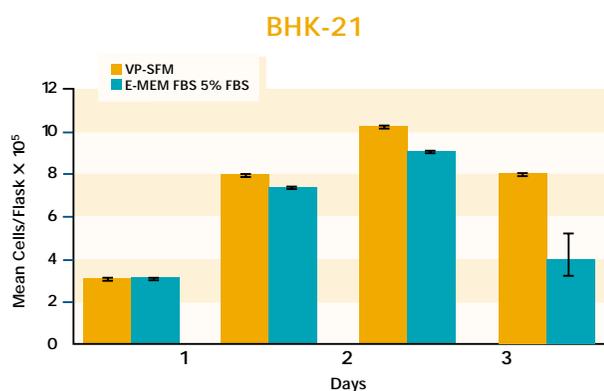


Figure 5. BHK-21 cell growth comparison. BHK-21 cells were grown in suspension in shaker flasks in duplicate on an orbital shaker platform for 5 days without refeeding in VP-SFM or E-MEM with 5% FBS.

Cell Lines Tested

Cell Line Tested	Growth Medium	Mean Time Required for Cell Release	Mean Viability	Mean Cell Yield Expressed as Percent of Porcine Trypsin Control
VERO	VP-SFM	5 min	100 %	104 %
VERO	OptiPro™ SFM	7 min	98 %	130 %
PK-15	OptiPro™ SFM	11 min	98.8 %	106 %
MDCK	OptiPro™ SFM	28.5 min	98 %	87 %

Figure 6. No inhibitors were used following rProtease™ treatment. Following dissociation, cells were centrifuged and washed in growth medium. All cell lines were tested over at least 6 consecutive passages.

COS-7L Cells

For your convenience, we offer COS-7L cells pre-adapted to VP-SFM.

rProtease™

Animal-Origin-Free Cell Dissociation Enzyme

rProtease™ is a novel, microbially-produced alternative to animal trypsin. It is a recombinant protease manufactured in a controlled fermentation process, completely free of components derived from animals or humans.

rProtease™ maintains cell viability, yield, and morphology, and demonstrates equivalent performance and superior stability to trypsin. Stored frozen, refrigerated, or at room temperature, rProtease™ remains stable for at least six months. Because inactivating the enzyme is not necessary, rProtease™ can save you time and money while reducing risk and simplifying downstream processing.

Custom Production and Packaging

When you need a unique formulation or special packaging, our Custom Product Services team can modify GIBCO® catalog media formulations and packaging to meet your particular requirements.

Media are available in different formats for easy scale-up to meet the needs of various levels of product development: R&D, process development, pilot plant, and manufacturing.

We can produce volumes as small as a few liters to > 30,000 liters, or > 100,000 liters in dry format. In addition, we offer large media bag packaging options up to 500 liters.

The Custom Product Services team can also assess feasibility and provide options for formulation design, testing, and packaging for your proprietary formulations.

For information call 1-800-955-6288, Ext. 46966.

Reference

VP-SFM

Price, P. and Evege, E. (1997) *Focus*® **19**, 67.

Ordering Information

Description	Catalog No.	Size
 VP-SFM (1X), liquid	11681-020	1,000 ml
 VP-SFM AGT™ Dry granular format of VP-SFM.	12559-027 12559-019	1 L 1 × 10 L (case)
 OptiPro™ SFM (1X), liquid	12309-019	1,000 ml
 COS-7L Cells	11622-016	1.5 ml
 rProtease™ An animal-origin-free cell dissociation enzyme.	12563-011 12563-029	100 ml 500 ml

Related Products

Nutritional Supplements

GlutaMAX™-I Supplement Stable form of L-glutamine.	35050-061	100 ml
L-Glutamine-200 mM (100X), liquid	25030-081	100 ml

Selective Antibiotics

Geneticin® Selective Antibiotic, powder	11811-031	5 g
Geneticin® Selective Antibiotic, liquid 500 mg/ml.	10131-035 10131-027	20 ml 100 ml

For use with VP-SFM AGT™ Media

 Distilled Water	15230-196	20 × 100 ml (case)
	15230-162	500 ml
	15230-204	10 × 500 ml (case)
	15230-147	1,000 ml

All media listed above can be customized to suit your needs. Please inquire.



www.invitrogen.com



Corporate Headquarters: Invitrogen Corporation • 1600 Faraday Avenue • Carlsbad, California 92008 U.S.A.
Tel: 1 760 603 7200 • Tel (Toll Free): 1 800 955 6288 • Toll Free Fax: 1 800 331 2286 • E-mail: tech_service@invitrogen.com
European Headquarters: Invitrogen Ltd • 3 Fountain Drive • Inchinnan Business Park • Paisley PA4 9RF, UK
Tel: + 44(0) 141 814 6100 • Fax: + 44(0) 141 814 6260 • E-mail: eurotech@invitrogen.com



These products are for research use, and where appropriate, as raw material components in further cell culture manufacturing applications. They are not intended for human or animal diagnostic, therapeutic, or other clinical uses, unless otherwise stated. © 2003 Invitrogen Corporation PAS03-057MS Part No. 332-032443D