

4Cell® NutriVero™ Flex 10 Medium

Next Generation Chemically Defined Medium Designed to Support the Growth of Vero Cells and Virus Production



Product Information

4Cell® NutriVero™ Flex 10 is a chemically defined, serum-free, animal component-free medium, newly developed to support Vero cell growth in 2D monolayers as well as in 3D microcarriers suspension culture systems and optimized for the production of viruses.

The chemically defined 4Cell® NutriVero™ Flex 10 is a robust medium which contains solely recombinant components and does not contain any plant extract (hydrolysates), therefore providing consistent results.

Benefits

Developed together with Intravacc, an R&D organization for translational vaccinology, this chemically defined, serum-free, animal component-free medium will give you consistent results and maximum control over your virus production process:

- Production efficacy: high cell growth and virus titer in a chemically defined format
- Operational efficiency: simplify your downstream purification and filtration processes while increasing virus productivity
- Safety and regulatory-friendly: reduced process variability and contamination risks for optimal safety

Applications

Isolated from the kidney of the African green monkey by Yasumura and Kawakita in Japan (1962), the Vero cell line is used for various purposes, most importantly for the production of cell culture-based viral vaccines. Reasons for the extensive use of the Vero cell line are the consistent high viral yields and relatively easy adaptation for growth in bioreactors on microcarriers, thus allowing greater vaccine purity as well as quantity.

Features of the Standard Product



Technical Data

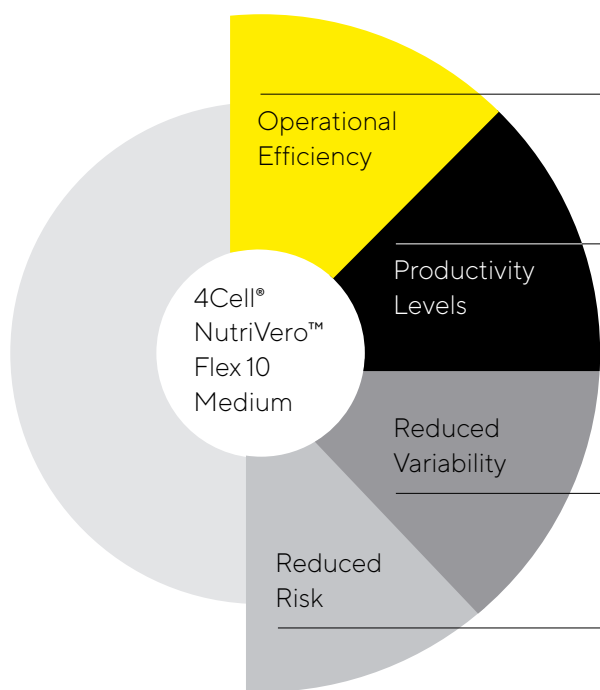
Specifications

Media Type	Chemically defined medium: does not contain serum or animal origin components
Easy-to-use	Available in liquid or as powder with supplement
Cell Line	Developed for adherent Vero cells in monolayers and microcarriers
Storage Condition	Bottle: 2-8 °C, protect from direct light Bag: 2-8 °C, protect from direct light Powder: 2-8 °C, protect from direct light Frozen liquid supplement for powder: -20 °C, protect from direct light

Features of the Standard Product

- CD** **Chemically defined:** the exact concentration and size of every component is known
- NAO** **Non-animal origin:** the formulation is entirely made from non-animal-human origin components
- RP** **Recombinant protein:** the formulation contains very low concentration of recombinant factors
- FFM** For research or for further manufacturing use
- Product available in liquid format
- Product available in powder format
- Product available in bag format

Your Benefits at a Glance



One medium from seed to manufacturing with **easy downstream processing due to serum-free composition**

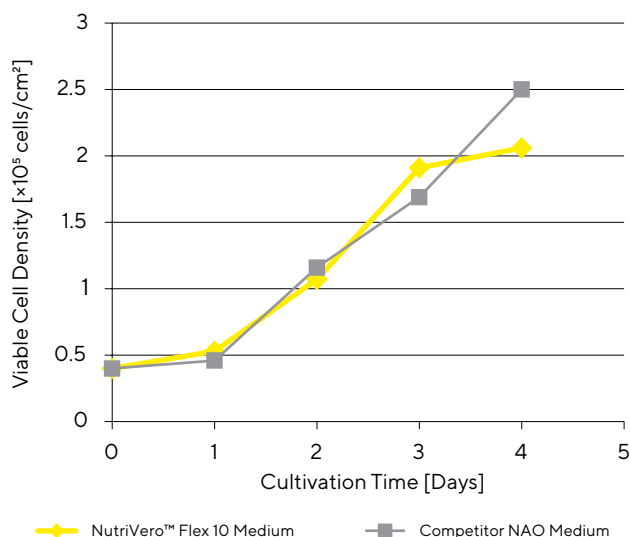
Excellent performances in supporting Vero grow and **high virus production** as 2D monolayers as well as 3D microcarriers **suspension cultures**

Absence of hydrolysates significantly reduces the amount of process variability

Fully chemically defined medium reduces the possibility of contamination by animal-derived components and **facilitates regulatory compliance**

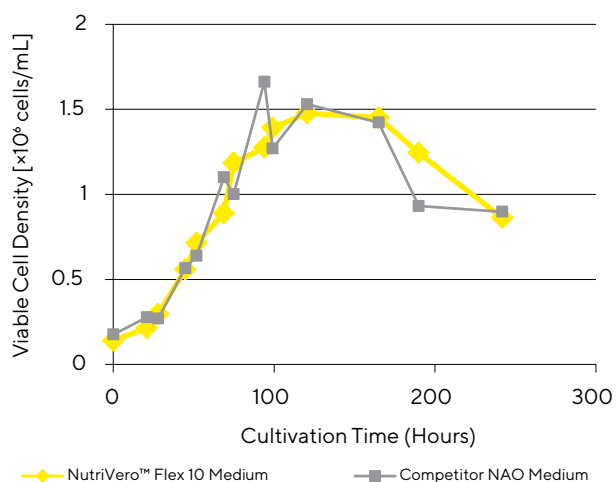
4Cell® NutriVero™ Flex 10 Medium performance have been evaluated on Vero cells' growth in adherent 2D monolayers (fig. 1A) and 3D microcarriers beads (fig. 1B). In both systems 4Cell® NutriVero™ Flex 10 Medium showed equivalent performance as reference medium containing undefined extracts (hydrolysates).

Figure 1A: 4Cell® NutriVero™ Flex 10 Performance in Vero Cell 2D Culturing System



Note. Vero cells were seeded in T25 flasks at a cell density of 40,000 cells/cm² and incubated at 37 °C in a humidified atmosphere and 5% CO₂ with 4Cell® NutriVero™ Flex 10 or reference medium.

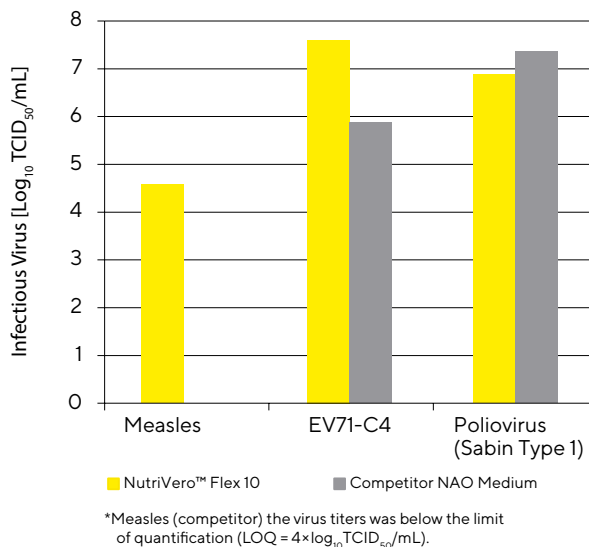
Figure 1B: Vero Cell Growth Density in a 3D Culture System



Note. Two parallel bioreactors were filled up to 2 L of working volume of chemically defined 4Cell® NutriVero™ Flex 10 and undefined reference medium. Stirring speed was set between 70 and 130 rpm, temperature set to 37 °C and pH controlled to 7.2. The bioreactors were seeded with 0.15×10⁹ cells/L and 3 g/L of microcarriers.

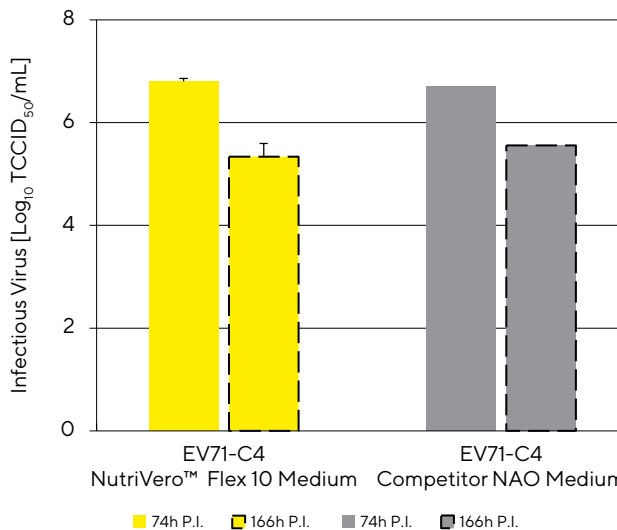
Virus quantification was performed by calculating the TCID₅₀ (50% Tissue Culture Infective Dose) index. 4Cell® NutriVero™ Flex 10 Medium showed high abilities in supporting Vero infection and virus productivity in 2D monolayers (fig. 2A) and suspension in microcarriers beads (fig. 2B) compared to reference medium containing undefined extracts (hydrolysates).

Figure 2A: Initial Assessment of Defined 4Cell® NutriVero™ Flex 10 Medium Viral Production Capacity



Note. Vero cells were seeded in 6-well plates at a cell density of 30,000 cells/cm² of culture, the cultures were infected with various viruses: Measles, Sabin poliovirus type 1 and EV71-C4. Following 7 days the cultures showed a positive CPE and the supernatant was harvested and analyzed for the amount of infectious particles by means of a virus titration procedure.

Figure 2B: Enterovirus 71-C4 Virus Production in a 3D Microcarriers Culture System



Note. Vero cells were cultured in 1 L bioreactors at 0.12±0.03×10⁶ cells/mL for 3 days, up to a concentration of 0.9±0.2×10⁶ cells/mL. At 66 hours post seeding, the cells were infected with EV71-C4 at a titer of 7.55 log₁₀ TCID₅₀/mL. Samples were taken at indicated time points post infection, and analyzed for virus titer.

Ordering Information

Description	Form	Package	Volume*	Order Code
4Cell® NutriVero™ Flex 10 Medium	Liquid	Bottle	0.5 L	CFV3FA4009
4Cell® NutriVero™ Flex 10 Medium	Liquid	Bottle	1 L	CFV3FA4010
4Cell® NutriVero™ Flex 10 Medium P-Red Medium	Liquid	Bottle	0.5 L	CFV3FA4000
4Cell® NutriVero™ Flex 10 Medium P-Red Medium	Liquid	Bottle	1 L	CFV3FA4001
4Cell® NutriVero™ 10 L Bag	Liquid	Bag	10 L	CFV3FA4013
4Cell® NutriVero™ 20 L Bag	Liquid	Bag	20 L	CFV3FA4014
4Cell® NutriVero™ Powder and Supplement 10 L**	Powder and frozen supplement	Bucket and bottle	10 L	CQV3FA5002
4Cell® NutriVero™ Powder and Supplement 50 L**	Powder and frozen supplement	Bucket and bottle	50 L	CQV3FA5003
4Cell® NutriVero™ Powder and Supplement 100 L**	Powder and frozen supplement	Bucket and bottle	100 L	CQV3FA5004

* Other sizes are available on request

** Articles delivered in two parts: powder bucket and frozen liquid supplement

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