

**Cytion293F-X Cells | 305927****General information****Description**

Cytion293F-X refers to a suspension-adapted human embryonic kidney cell line equivalent to HEK293F cells, derived from the original HEK293 lineage. These cells originate from human embryonic kidney tissue and have been adapted for growth in serum-free, chemically defined media under suspension culture conditions. This adaptation enables high-density growth in shaker flasks or bioreactors, making them particularly suitable for large-scale protein expression. Like other HEK293 derivatives, 293F-X cells retain the adenoviral E1A/E1B genomic integration that supports robust transgene expression.

Cytion293F-X cells are optimized for transient transfection workflows, especially for the production of recombinant proteins, monoclonal antibodies, and viral vectors. They exhibit high transfection efficiency using chemical methods such as polyethyleneimine (PEI) or lipid-based reagents, and are capable of producing substantial protein yields within short timeframes. Their suspension growth and scalability allow for efficient upscaling from small laboratory volumes to industrial bioprocessing systems, while maintaining consistent expression performance.

In addition to protein production, Cytion293F-X cells are widely used in virology and gene delivery research, including the generation of adeno-associated virus (AAV) and lentiviral particles. They maintain key characteristics of HEK293-derived systems, including human-like post-translational modification machinery, which is critical for proper protein folding and glycosylation. However, as with other HEK293 variants, genomic heterogeneity and clonal variation may influence expression outcomes, and optimization of culture and transfection parameters is often required for specific applications.

**Organism** Human**Tissue** Kidney**Applications** Transfection host**Characteristics****Age** Fetus**Gender** Female**Morphology** Epithelial-like**Growth properties** Suspension**Regulatory Data****Citation** Cytion293F-X (Cytion catalog number 305927)

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**Biosafety level** 1

**NCBI\_TaxID** 9606

**GMO Status** GMO-S1: This Cytion293F-X cell line contains SV40, enabling high transfection efficiency and robust growth in suspension culture. The modification is stably present in embryonic kidney cells. This classification applies only within Germany and may differ elsewhere.

## Biomolecular Data

**Receptors expressed** Vitronectin

**Protein expression** CEA negative, p53 positive

**Tumorigenic** In nude mice

**Viruses** Transformed with adenovirus 5 DNA adenovirus 5 DNA

## Handling

**Culture Medium** Expi293 Expression Medium

**Dissociation Reagent** None

**Subculturing** Remove the old medium from the adherent cells and wash them with PBS that lacks calcium and magnesium. For T25 flasks, use 3-5 ml of PBS, and for T75 flasks, use 5-10 ml. Then, cover the cells completely with Accutase, using 1-2 ml for T25 flasks and 2.5 ml for T75 flasks. Let the cells incubate at room temperature for 8-10 minutes to detach them. After incubation, gently mix the cells with 10 ml of medium to resuspend them, then centrifuge at 300xg for 3 minutes. Discard the supernatant, resuspend the cells in fresh medium, and transfer them into new flasks that already contain fresh medium.

**Seeding density** 0.3 to  $1 \times 10^6$  cells/ml

**Fluid renewal** 2 times per week

**Post-Thaw Recovery** After thawing, plate the cells at  $5 \times 10^4$  cells/cm<sup>2</sup> and allow the cells to recover from the freezing process and to adhere for at least 24 hours.

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### Freeze medium

As a cryopreservation medium, we use complete growth medium (including FBS) + 10% DMSO for adequate post-thaw viability, or CM-1 (Cytion catalog number 800100), which includes optimized osmoprotectants and metabolic stabilizers to enhance recovery and reduce cryo-induced stress.

### Thawing and Culturing Cells

1. Confirm that the vial remains deeply frozen upon delivery, as cells are shipped on dry ice to maintain optimal temperatures during transit.
2. Upon receipt, either store the cryovial immediately at temperatures below -150°C to ensure the preservation of cellular integrity, or proceed to step 3 if immediate culturing is required.
3. For immediate culturing, swiftly thaw the vial by immersing it in a 37°C water bath with clean water and an antimicrobial agent, agitating gently for 40-60 seconds until a small ice clump remains.
4. Perform all subsequent steps under sterile conditions in a flow hood, disinfecting the cryovial with 70% ethanol before opening.
5. Carefully open the disinfected vial and transfer the cell suspension into a 15 ml centrifuge tube containing 8 ml of room-temperature culture medium, mixing gently.
6. Centrifuge the mixture at 200 x g for 5 minutes, carefully discard the supernatant containing freezing medium.
7. Follow the procedure described under Post-Thaw Recovery

### Incubation Atmosphere

37°C, 5% CO<sub>2</sub>, humidified atmosphere.

### Shipping Conditions

Cryopreserved cell lines are shipped on dry ice in validated, insulated packaging with sufficient refrigerant to maintain approximately -78 °C throughout transit. On receipt, inspect the container immediately and transfer vials without delay to appropriate storage.

### Storage Conditions

For long-term preservation, place vials in vapor-phase liquid nitrogen at about -150 to -196 °C. Storage at -80 °C is acceptable only as a short interim step before transfer to liquid nitrogen.

## Quality Control & Molecular Analysis