Product sheet

HEK293 suspension-adapted | 300686

General information

Description	The adaptation of the HEK293 cell line to suspension culture resulted in robust growth and achieved similar or improved maximum cell density compared to adherent cultures. This transition to suspension culture simplifies subcultivation, enhances scalability, and reduces production costs, making it an advantageous approach for large-scale manufacturing of biotechnological products. The HEK293 cell line, initially derived in the 1970s, arose from the transformation of human embryonic kidney cells with sheared adenovirus 5 DNA, leading to approximately 30% of cells exhibiting hypotriploid karyotypes with 64 modal chromosomes and 4.2% with higher ploidies. The multiple copies of adenovirus E1A and E1B genes in HEK293 cells result in high transfection efficiency, making them valuable in biotechnology for protein expression, gene therapy, and vaccine production. Moreover, the pharmaceutical industry employs HEK293 cells for high-throughput screening assays due to their ability to be transfected with plasmids encoding drug targets and cultured in large numbers. In industrial biotechnology, HEK293 cells serve as hosts for producing recombinant proteins, enzymes, and biosensors. Additionally, HEK293 cells are essential in toxicology research for studying the effects of chemicals and environmental toxins on cellular processes and gene expression. Notably, the HEK293 cell line is also utilized to generate recombinant viruses like adenovirus and lentivirus for gene therapy, viral replication, and host-virus interactions. Overall, the suspension-adapted HEK293 cell line, along with its versatile applications in biomedical research, biotechnology, pharmaceuticals, and toxicology, signifies a significant advancement in the field of cell culture technology.
Organism	Human
Tissue	Kidney
Applications	Transfection host

Characteristics

Age	Fetus
Gender	Female
Growth properties	Suspension

Identifiers / Biosafety / Citation

Citation	HEK293 suspension-adapted (Cytion catalog number 300686)
Biosafety level	1
NCBI_TaxID	9606

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CellosaurusAccession	CVCL_0045

Expression / Mutation

Receptors expressed	Vitronectin
Protein expression	CEA negative, p53 positive
Tumorigenic	In nude mice
Virus susceptibility	transformed with adenovirus 5 DNA adenovirus 5 DNA

Handling

Culture Medium	Panserin 293S
Passaging solution	The utilization of a passaging solution is not necessary when passaging cells that are cultured in suspension. The appropriate procedure is to dilute the cells in accordance with the indicated guidelines.
Subculturing	Cultures can be maintained by addition or replacement of medium. Start new cultures at 3 x 10^5 viable cells/ml and subculture at 1 x 10^6 cells/ml.
Seeding density	3 x 10^5 cells/ml
Fluid renewal	2 to 3 times per week
Freeze medium	CM-1 (Cytion catalog number 800100) or CM-ACF (Cytion catalog number 806100)

Handling of cryopreserved cultures	The cells come deep-frozen shipped on dry ice. Please make sure that the vial is still frozen. If immediate culturing is not intended, the cryovial must be stored below -150 degree Celsius after arrival. If immediate culturing is intended, please follow the below instructions: Quickly thaw by rapid agitation in a 37 degree Celsius water bath within 40-60 seconds. The water bath should have clean water containing an antimicrobial agent. As soon as the sample has thawed, remove the cryovial from the water bath. A small ice clump should still remain and the vial should still be cold. From now on, all operations should be carried out under aseptic conditions. Transfer the cryovial to a sterile flow cabinet and wipe with 70% alcohol. Carefully open the vial and transfer the cell suspension into a 15 ml centrifuge tube containing 8 ml of culture medium (room temperature). Resuspend the cells carefully. Centrifuge at 300 x g for 3 min and discard the supernatant. The centrifugation step may be omitted, but in this case the remains of the freeze medium have to be removed 24 hours later. Resuspend the cells carefully in 10 ml fresh cell culture medium and transfer them into two T25 cell culture flasks. All further steps are described in the subculture section.
Handling of proliferating cultures	One or two cell culture flasks come filled with cell culture medium. Collect the entire medium in 1 or 2 x 50 ml centrifuge tubes, respectively. Carefully add 5 ml of cell culture medium to each T25 cell culture flask. Control the cell morphology and confluency under the microscope. Incubate at 37 degree Celsius for a minimum of 24 hours. Spin down the collected medium at 300 x g for 3 minutes to collect the cells which may have detached during transit. If a cell pellet is visible, resuspend the cells in 5 ml of cell culture medium and transfer to a T25 cell culture flask. Incubate at 37 degree Celsius for a minimum of 24 hours.

Quality control / Genetic profile / HLA

Sterility	Mycoplasma contaminations are ruled out through PCR-based and luminescence-based mycoplasma assays. The absence of bacterial, fungal or yeast contamination is controlled through daily visual cell monitoring.
STR profile	**Amelogenin**: x,x **CSF1PO**: 11,12 **D13S317**: 12,14 **D16S539**: 9 **D5S818**: 8,9 **D7S820**: 11,12 **TH01**: 7,9.3 **TPOX**: 11 **vWA**: 16,19 **D3S1358**: 15,17 **D21S11**: 28,30.2 **D18S51**: 18 **Penta E**: 7,15 **Penta D**: 9,10 **D8S1179**: 12,14 **FGA**: 23