Product sheet

Jurkat Cells | 302147

General information

Description	Jurkat cells, which originated from the peripheral blood of a 14-year-old with T-cell acute lymphoblastic leukemia (T-ALL), are a well-known human T lymphocyte cell line commonly used in cell biology studies, particularly in cancer research and immune system disorder investigations. These cells play a crucial role in understanding various cellular processes, including cell death mechanisms, autophagy activity, and cytoplasmic transcription factors. Jurkat cells are commonly used in HIV research due to their expression of the CD4 receptor on their cell membrane, which makes them susceptible to HIV infection. Their utilization in HIV studies has significantly contributed to understanding the virus's interactions with human cells and has been instrumental in identifying potential targets for antiretroviral therapies. One significant aspect of Jurkat cells is their involvement in evaluating cytotoxicity and viability assays, making them valuable in assessing the efficacy of potential cancer treatments or immune system modulators. Researchers often utilize Jurkat cells to study the impact of cytotoxic agents on cell membrane permeability and transport properties. Jurkat's Lck gene mutation leads to continuous T-cell activation, making them vital for exploring T-cell activation, signaling, and the lymphocyte activation pathway, including cell cycle, proliferation, and differentiation. A Jurkat cell line derivative, known as Jurkat clone E6 cells or Jurkat E6.1, further enhanced our understanding of cellular events, the properties of the cell membrane and single cells. In summary, Jurkat cells serve as invaluable tools in a wide range of research areas, from cancer biology to HIV infection studies, offering insights into cell biology, immune system function, and potential therapeutic interventions.
Organism	Human
Tissue	Blood
Disease	T-cell acute lymphoblastic leukemia
Metastatic site	Peripheral blood
Applications	T-cell biology research, development of T-cell therapies, study of T-cell activation and signaling, drug efficacy testing (e.g., kinase inhibitors), cancer research focusing on T-cell acute lymphoblastic leukemia.
Synonyms	JURKAT, JM, JM-Jurkat, Jurkat-FHCRC, Jurkat FHCRC, FHCRC-11, FHCRC subclone 11, FCCH1024

Characteristics

Age	14 years
Gender	Male
Ethnicity	European
Morphology	Lymphoblast

Growth properties	Suspension

Identifiers / Biosafety / Citation

Citation	Jurkat (Cytion catalog number 302147)
Biosafety level	1

Expression / Mutation

Antigen expression	Jurkat cells express T-cell receptor (TCR) and CD3 proteins. They also express CD4 and CD8 co-receptors, which aids in identifying them as helper or cytotoxic T cells.
Mutational profile	The Jurkat cells have a point mutation in the Lck gene, which encodes a protein necessary for T-cell activation, causing T cells to be constitutively activated.
Karyotype	The Jurkat cell line is hypotetraploid with a flat modal karyotype of 46 chromosomes and 7.8% polyploidy.

Handling

Culture Medium	RPMI 1640, w: 2.1 mM stable Glutamine, w: 2.0 g/L NaHCO3 (Cytion article number 820700a)
Medium supplements	Supplement the medium with 10% heat-inactivated FBS
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.
Doubling time	26 hours
Subculturing	Resuspend cell suspension in the flask and take representative aliquote to count the cell number per ml. Dilute cell suspension to 1 x 10^5 cells/ml with fresh medium and transfer into new flasks.
Split ratio	1:2 to 1:5
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	Jurkat cells are shipped in a deep-frozen state on dry ice. Upon receipt, confirm that the vial remains frozen. For storage, place the cryovial immediately at temperatures below -150 degrees. If you plan to culture the cells immediately, swiftly thaw the vial by shaking it in a 37 degrees water bath with clean water and an antimicrobial agent for 40-60 seconds. Remove the vial once a small ice clump persists, ensuring it remains cold. Proceed with all subsequent steps under aseptic conditions. In a sterile flow hood, disinfect the cryovial with 70% ethanol. Then, gently open the vial and transfer the cell suspension into a 15 ml centrifuge tube pre-filled with 8 ml of room temperature culture medium. Gently mix the cells. For cell separation, centrifuge at 300 x g for 3 minutes and dispose of the supernatant. Skipping centrifugation is optional, although any residual freezing medium should be removed after 24 hours. Resuspend the pellet gently in 10 ml of fresh culture medium and divide between two T25 culture flasks. Follow the subculture protocol for subsequent steps.
Handling of proliferating cultures	One or two cell culture flasks come filled with cell culture medium. Collect the entire medium in a 50 ml centrifuge tube. 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. Carefully add 5 ml of cell culture medium to each T25 cell culture flask. Examine cell morphology and confluency using a microscope. Finally, incubate the flasks at 37 degrees Celsius for at least 24 hours.

Quality control / Genetic profile / HLA

Sterility	Mycoplasma contamination is rigorously excluded using both PCR-based assays and luminescence-based mycoplasma detection methods. To ensure there is no bacterial, fungal, or yeast contamination, cell cultures are subjected to daily visual inspections.