Product sheet

Jurkat E6.1 Cells | 300223

General information

Description	Jurkat E6.1 cells, a derivative clone of the Jurkat cell line, which originates from the peripheral blood of a 14-year-old boy with acute T-cell leukemia, are a pivotal resource in the field of tumor immunology and leukemia research. These cells exhibit rapid proliferation and a pronounced responsiveness to stimuli, crucial for studying T cell biology, including T cell receptor (TCR) signaling, activation, proliferation, and apoptosis. Characterized by mutations such as the TEL-JAK2 fusion gene, Jurkat E6.1 cells provide insights into the leukemia phenotype and the molecular mechanisms underlying T-cell leukemia. Jurkat E6.1 cells are commonly used to investigate the intracellular signaling pathways that are activated upon TCR engagement, such as the NF-κB pathway, MAPK pathways, and calcium signaling, which are crucial for T cell activation and function. The cell line's responsiveness to phorbol esters and agents targeting the T3 antigen makes it an invaluable tool for exploring the intricacies of T-cell activation, including the induction of Interleukin-2 (IL-2) production. This feature, combined with their abnormal karyotype, underscores the utility of Jurkat E6.1 cells in research focused on the immune synapse architecture and the signaling pathways that govern T-cell proliferation and function. Jurkat E6.1 cells' utility extends to the study of apoptosis, offering a model to investigate the effects of various compounds, including alkaloids extract from sources such as Tribulus terrestris, on cell death pathways. This aspect is particularly relevant for identifying potential therapeutic agents and understanding their mechanisms of action in T-cell leukemia. In summary, Jurkat E6.1 cells, with their unique characteristics and versatility, continue to be a cornerstone in the study of T-cell activation, signaling, and apoptosis.
Organism	Human
Tissue	Blood
Disease	Acute T cell leukemia
Metastatic site	T lymphocyte
Synonyms	JurkatE6-1, Jurkat E6-1, Jurkat, Clone E6-1, Jurkat Clone E6-1, Jurkat (clone E6-1), JURKAT E-6.1, JURKAT E-61, Jurkat-E6, Jurkat E6, J.E6-1, E6-1

Characteristics

Age	14 years
Gender	Male
Morphology	Round cells

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Cell type	Lymphoblast
Growth properties	Suspension

Regulatory Data

Citation	Jurkat E6.1 (Cytion catalog number 300223)
Biosafety level	1
NCBI_TaxID	9606
CellosaurusAccession	CVCL_0367

Biomolecular Data

Antigen expression	CD3
Products	Interleukin-2 (interleukin 2, IL-2), interferon gamma
Karyotype	Modal number = 46, range = 41 to 47, the karyotype is 46,xY,-2,-18, del(2)(p21p23), del(18)(p11.2)

Handling

Culture Medium	RPMI 1640, w: 2.0 mM stable Glutamine, w: 2.0 g/L NaHCO3 (Cytion article number 820700a)
Supplements	Supplement the medium with 10% FBS
Subculturing	Maintain cultures by periodically adding or replacing the medium. Initiate cultures with a density of 5 x 10^5 cells/ml and keep the cell concentration within the range of 3 x 10^5 to 1 x 10^6 cells/ml for optimal growth.
Seeding density	1 x 10^5 cells/ml
Fluid renewal	Every 2 days
Post-Thaw Recovery	Fast

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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 300 x g for 3 minutes to separate the cells and carefully discard the supernatant containing residual freezing medium.
7. Gently resuspend the cell pellet in 10 ml of fresh culture medium. For adherent cells, divide the suspension between two T25 culture flasks; for suspension cultures, transfer all the medium into one T25 flask to promote effective cell interaction and growth.
8. Adhere to established subculture protocols for continued growth and maintenance of the cell line, ensuring reliable experimental outcomes.

Incubation Atmosphere	37°C, 5% CO_2, 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

Sterility	Mycoplasma contamination is 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.