

KYSE180 Cells | 305450

General information

Description

The KYSE180 cell line is a human esophageal squamous cell carcinoma (ESCC) model derived from a primary tumor. This cell line is classified as moderately differentiated and exhibits a range of genetic alterations characteristic of ESCC, including mutations in the NRF2 (NFE2L2) signaling pathway. Specifically, KYSE180 cells harbor the NRF2 D77V mutation, which contributes to the hyperactivation of NRF2, a transcription factor involved in oxidative stress response and tumor progression.

KYSE180 cells are widely used to study the molecular mechanisms of ESCC, including chemoresistance and oncogenic signaling. Elevated NRF2 activity in KYSE180 cells has been linked to resistance to chemotherapy and radiotherapy, as NRF2 enhances cellular antioxidant defenses and metabolic adaptations. Recent research has identified compounds like pyrimethamine that inhibit NRF2 signaling, resulting in reduced proliferation and tumorigenicity of KYSE180 cells. Such studies highlight the therapeutic potential of targeting NRF2 in NRF2-high cancers.

Additionally, KYSE180 cells have been utilized to evaluate the roles of the aldo-keto reductase (AKR) family of enzymes, particularly AKR1C1 and AKR1C2, in drug metabolism and chemoprevention. The expression of these enzymes is upregulated in KYSE180 cells, enhancing sensitivity to agents such as ethyl-3,4-dihydroxybenzoate (EDHB). This compound induces apoptosis and autophagy, demonstrating the cell line's utility in exploring drug responses and cellular stress mechanisms in ESCC.

Organism

Human

Tissue

Esophagus

Disease

Squamous cell carcinoma

Synonyms

KYSE 180, KYSE-180, Kyse180, KY180

Characteristics

Age

53 years

Gender

Male

Ethnicity

Japanese

Morphology

Epithelial-like

Growth properties

Adherent, monolayer

Regulatory Data

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Citation	KYSE180 (Cytion catalog number 305450)
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Biosafety level	1
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NCBI_TaxID	9606
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CellosaurusAccession	CVCL_1349
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Biomolecular Data

MSI-status	Stable (MSS)
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Mutational profile	Mutation: TP53, p.Ile195Thr (c.584T>C), homozygous
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Handling

Culture Medium	RPMI 1640, w: 2.0 mM stable Glutamine, w: 2.0 g/L NaHCO ₃ (Cytion article number 820700a)
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Supplements	Supplement the medium with 10% FBS
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Dissociation Reagent	Accutase
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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.
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Seeding density	2-4*10 ⁴ /cm ²
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Fluid renewal	2 times per week
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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.
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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% CO₂, 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

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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.