Ku 80-/-

305258

GENERAL INFORMATION

Description

Ku80-/- MEF (Mouse Embryonic Fibroblast) cells are genetically engineered fibroblast cells derived from mice that lack the Ku80 gene (XRCC5). The Ku80 protein, in conjunction with Ku70, forms the Ku heterodimer, which is essential for the non-homologous end joining (NHEJ) pathway of DNA double-strand break (DSB) repair. The absence of Ku80 in these cells impairs their ability to effectively repair DSBs, making them a valuable model for studying the role of the NHEJ pathway in genomic stability, DNA repair mechanisms, and cancer biology.
Ku80-/- MEF cells exhibit increased sensitivity to ionizing radiation and other DNA-damaging agents due to their compromised DSB repair capacity. These cells also tend to accumulate chromosomal aberrations and exhibit genomic instability. The lack of Ku80 affects not only DNA repair but also other cellular processes such as V(D)J recombination, which is crucial for the development of a diverse repertoire of antibodies and T-cell receptors in the immune system.
Research using Ku80-/- MEF cells has provided significant insights into the molecular mechanisms of NHEJ and the broader implications of defective DNA repair. These studies are crucial for understanding the development of cancer and other diseases associated with genomic instability. Additionally, they help in the exploration of potential therapeutic targets for enhancing DNA repair in cancer cells, thereby improving the efficacy of cancer treatments that rely on inducing DNA damage in tumor cells.

Tissue	Embryo
Disease	Normal mouse embryonic fibroblast (Ku80/XRCC5 knockout; SV40-immortalized; NHEJ-deficient)
Metastatic site	Not applicable (immortalized MEF; not a clinical tumor sample)

Applications

NHEJ DNA repair research; Ku80/XRCC5 function; DNA double-strand break (DSB) repair; genomic instability modeling; radiation sensitivity; V(D)J recombination; cancer biology; genotoxicity testing; DNA damage response

Synonyms

- Ku80-/- MEF

CLASSIFICATION

Organism	Mouse
Sex	Unspecified
Growth properties	Adherent
GMO status	GMO-S1

GMO status details

GMO-S1: This MEF line carries homozygous Ku80 (XRCC5) knockout and SV40 large T antigen immortalization. The SV40 transgene is stably integrated. This classification applies only within Germany and may differ elsewhere.

Biosafety level	2

CHARACTERISTICS

Morphology	Fibroblast-like
Cell type	Fibroblast

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IDENTIFIERS

Citation

Ku 80-/- (Cytion catalog number 305258)

NCBI TaxID	10090
Cellosaurus	CVCL_UJ16

EXPRESSION AND SUSCEPTIBILITY

Mutational profile

Mutation: Ku80-/-

Viruses

Transformant: Simian virus 40 (SV40)

HANDLING AND CULTURE

Culture medium

DMEM, w: 4.5 g/L Glucose, w: 4 mM L-Glutamine, w: 3.7 g/L NaHCO3, w: 1.0 mM Sodium pyruvate (Cytion article number 820300a)

Incubation atmosphere	37°C, 5% CO_2, humidified atmosphere.

Supplements

Supplement the medium with 10% FBS

Dissociation reagent	Accutase

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.

Thawing and culturing

Confirm that the vial remains deeply frozen upon delivery, as cells are shipped on dry ice to maintain optimal temperatures during transit.
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.
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.
Perform all subsequent steps under sterile conditions in a flow hood, disinfecting the cryovial with 70% ethanol before opening.
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.
Centrifuge the mixture at 300 x g for 3 minutes to separate the cells and carefully discard the supernatant containing residual freezing medium.
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.
Adhere to established subculture protocols for continued growth and maintenance of the cell line, ensuring reliable experimental outcomes.

QUALITY CONTROL AND CRYOPRESERVATION

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.

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.

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.

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.

DONOR

Donor age	12-13 fetal days
Ethnicity	Not applicable (mouse cell line)

LEGAL AND SAFETY

Safety precautions

When planning to store a cryovial in liquid nitrogen for future thawing, it is mandatory to adhere to stringent safety measures. Appropriate protective gloves and clothing are essential, and the use of a face mask or safety goggles is required during the transfer of frozen samples to or from the liquid nitrogen tank. This is to mitigate the risk of injury from potential cryovial explosions upon removal, which can result in the projection of sharp fragments.

Warranty

At Cytion, we stand behind the quality and viability of our products.
We guarantee that our cells will be viable at the start of culture for
60 days after shipment from our facilities.
We assure that all materials conform to the specifications described in the
Certificate of Analysis and/or Product Sheet.
For full details, please refer to our
Warranty Statement.

Material Transfer Agreement required	Yes