U937

300368

GENERAL INFORMATION

Description

The U937 cell line, established from the pleural effusion of a patient with generalized histiocytic lymphoma in 1976, has become an essential cellular model in the field of immunology, particularly in studies related to monocyte and macrophage biology. U937 cells have contributed significantly to our understanding of cell differentiation, immune response, and the pathogenesis of diseases like leukemia.
The U937 cell line is extensively utilized in immunological and hematological research due to its remarkable ability to differentiate into monocyte or macrophage-like cells when treated with agents like retinoids, Vitamin D3, and phorbol esters such as TPA (12-O-Tetradecanoylphorbol-13-acetate). This differentiation capacity is crucial for studying various aspects of monocyte and macrophage biology, including phagocytosis, antigen presentation, and cytokine production.
Upon differentiation, U937 cells adopt functional characteristics akin to those of mature immune cells, making them an invaluable model for investigating the monocyte-endothelium adhesion process, a critical step in the immune response and inflammation. Moreover, these cells have been employed to delve into the complex regulation of inflammatory gene expression and the signaling pathways involved, particularly the NF-κB pathway.
U937 cells are also widely used in the study of apoptosis, or programmed cell death. These cells are particularly useful for investigating the molecular pathways leading to apoptosis, the effects of various stimuli or drugs on apoptotic processes, and the interplay between apoptosis and other cellular functions like cell cycle regulation and differentiation.
In summary, the U937 cell line serves as a versatile and relevant model for studying a wide range of biological processes, from cell differentiation and apoptosis and the effect of pharmacological agents.

Disease	Lymphoma
Metastatic site	Pleural effusion

Synonyms

- U-937
- U 937

CLASSIFICATION

Organism	Human
Sex	Male
Growth properties	Suspension
Biosafety level	1

CHARACTERISTICS

Morphology	Round cells
Cell type	Monocyte-macrophage
Doubling time	36 hours

IDENTIFIERS

Citation

U937 (Cytion catalog number 300368)

NCBI TaxID	9606

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Cellosaurus	CVCL_0007

EXPRESSION AND SUSCEPTIBILITY

Receptors expressed

Immunoglobulin (Fc), complement (C3)

Products

Lysozyme, beta-2-microglobulin (beta 2 microglobulin), tumor necrosis factor (TNF), also known as tumor necrosis factor alpha (TNF-alpha, TNF alpha), after stimulation with phorbol myristic acid (PMA)

HANDLING AND CULTURE

Culture medium

RPMI 1640, w: 2.0 mM stable Glutamine, w: 2.0 g/L NaHCO3 (Cytion article number 820700a)

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

Supplements

Supplement the medium with 10% FBS

Subculturing

Gently homogenize the cell suspension in the flask by pipetting up and down, then take a representative sample to determine the cell density per ml. Dilute the suspension to achieve a cell concentration of 1 x 10^5 cells/ml with fresh culture medium, and aliquot the adjusted suspension into new flasks for further cultivation.

Seeding density	1 x 10^5 cells/mL
Fluid renewal	1 to 2 times per week
Post-thaw recovery	Fast

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	37 years
Ethnicity	Caucasian

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