**Product sheet**

# U937 Cells | 300368

## General information

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| **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.<br><br>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.<br><br>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.<br><br>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.<br><br>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. |
| **Organism** | Human |
| **Disease** | Lymphoma |
| **Metastatic site** | Pleural effusion |
| **Synonyms** | U-937, U 937 |

## Characteristics

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| **Age** | 37 years |
| **Gender** | Male |
| **Ethnicity** | Caucasian |
| **Morphology** | Round cells |

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| **Cell type** | Monocyte-macrophage |
| **Growth properties** | Suspension |

## Regulatory Data

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| **Citation** | U937 (Cytion catalog number 300368) |
| **Biosafety level** | 1 |
| **NCBI_TaxID** | 9606 |
| **CellosaurusAccession** | CVCL_0007 |

## Biomolecular Data

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| **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

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| **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 |
| **Doubling time** | 36 hours |
| **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 |

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| **Post-Thaw Recovery** | Fast |
| **Freeze medium** | As a cryopreservation medium, 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.<br>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.<br>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.<br>4. Perform all subsequent steps under sterile conditions in a flow hood, disinfecting the cryovial with 70% ethanol before opening.<br>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.<br>6. Centrifuge the mixture at 300 x g for 3 minutes to separate the cells and carefully discard the supernatant containing residual freezing medium.<br>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.<br>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. |

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| **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 / Genetic profile / HLA

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