MOVAS

305362

GENERAL INFORMATION

Description

The MOVAS cell line is a murine vascular smooth muscle cell (VSMC) line derived from the aortic smooth muscle cells of C57BL/6 mice. This immortalized cell line retains key smooth muscle characteristics, making it a valuable tool for studying VSMC biology and pathophysiology. MOVAS cells have been extensively used in research on vascular processes such as atherosclerosis, calcification, and cellular signal transduction. They express characteristic smooth muscle markers, including alpha-smooth muscle actin (α-SMA), and can be cultured under various experimental conditions to model vascular diseases.

One of the major applications of MOVAS cells is in the study of vascular calcification. This cell line can undergo calcification in vitro when cultured in calcifying media containing β-glycerophosphate and ascorbic acid, mimicking processes observed in primary VSMCs. MOVAS cells exhibit elevated alkaline phosphatase activity and calcium deposition, which are key markers of vascular calcification. This model has also been validated against primary murine aortic VSMCs, showing comparable responses to calcifying conditions and treatments with known inhibitors like levamisole and etidronate. These features establish MOVAS as a reliable and cost-effective alternative to primary VSMCs, reducing experimental variability and ethical concerns.

Additionally, MOVAS cells have been used to explore cholesterol metabolism, a process critical to atherosclerosis development. They express essential cholesterol transporters such as ABCA1 and ABCG1, and exhibit functionality in cholesterol efflux to HDL and apoAI. Cholesterol-loading experiments have demonstrated their ability to transdifferentiate into macrophage-like cells, a process linked to atherosclerotic plaque formation. These findings highlight the utility of MOVAS cells in studying cholesterol homeostasis, phenotypic plasticity, and vascular disease progression.

Tissue	Aorta, smooth muscle
Disease	Normal

Synonyms

- Movas-1
- MOVAS-1
- Movas

CLASSIFICATION

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

GMO status details

GMO-S1: This murine vascular smooth muscle cell line (MOVAS) contains a retroviral construct encoding SV40 T-Antigen together with a neomycin resistance marker, supporting sustained proliferation and transformation. The insert is stably integrated. This classification applies only within Germany and may differ elsewhere.

Biosafety level	1

CHARACTERISTICS

Morphology	Fibroblast-like
Cell type	Vascular associated smooth muscle cell

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BIC: SOLADES1HDB

IDENTIFIERS

Citation

MOVAS (Cytion catalog number 305362)

NCBI TaxID	10090
Cellosaurus	CVCL_0F08

EXPRESSION AND SUSCEPTIBILITY

Protein expression

Genes expressed: actin, smooth muscle alpha actin, calponin 1, basic, desmin, smooth muscle protein 22 (SM22 alpha)

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, 0.2 mg/mL G-418

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.

Seeding density	1-3*10^4/cm²
Fluid renewal	2 to 3 times per week

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.

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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.

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

Breed / subspecies	C57BL/6
Donor age	Adult

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