Human pulmonary artery smooth muscle cells (HPASMC)

300706

GENERAL INFORMATION

Description

Primary Human Pulmonary Artery Smooth Muscle Cells (HPASMC) are isolated from the pulmonary artery. They are a key model for pulmonary arterial hypertension, including hypoxia-driven proliferation and vascular remodeling.
Hypoxia drives the proliferation of HPASMC, and PDGF-BB shifts them toward a synthetic, migratory phenotype, reproducing key features of pulmonary vascular remodeling. Because the balance of BMP and TGF-β signaling is central to pulmonary arterial hypertension, the cells are also used to study BMPR2-related mechanisms.

Tissue	Lung (pulmonary artery
Disease	Normal pulmonary arterial smooth muscle (non-tumorigenic primary cell)
Metastatic site	Not applicable (normal, non-tumorigenic primary cell)

Applications

Pulmonary arterial hypertension: BMP/TGF-β balance, proliferation and migration; Hypoxia-induced proliferation, PPARγ and microRNA-21; Long non-coding RNA regulation of migration in pulmonary arterial hypertension; Functional testing of BMPR2 promoter variants in reporter assays; PDGF-BB-induced phenotype switching and metabolomics; Endothelin-1 signaling and proteomics of BMPR2-mutant cells

Synonyms

- HPASMC
- Human pulmonary artery smooth muscle cells
- provitro 1210613

DONOR

Donor age	Lot-specific (see CoA)
Ethnicity	Lot-specific (see CoA)

CLASSIFICATION

Organism	Human
Sex	Lot-specific
Growth properties	Adherent
GMO status	Non-GMO

GMO status details

No genetic modification; primary human pulmonary artery smooth muscle cells isolated from normal pulmonary arteries. Not transformed or immortalized.

Biosafety level	1

CHARACTERISTICS

Morphology	Spindle-shaped (smooth muscle)
Cell type	Primary smooth muscle cells

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Tumourigenic	No
Doubling time	Not specified by AddexBio; typical primary VSMC doubling time 36–72 hours

HANDLING AND CULTURE

Culture medium

Smooth Muscle Cell Growth Medium kit (Cytion article number 850075); Smooth Muscle Cell Growth Medium mix (Cytion article number 850074)

Incubation atmosphere	37°C, 5% CO_2, saturated humidity.

Supplements

Supplement as specified in the AddexBio SMC supplement kit (refer to specification sheet). For cryopreservation: complete culture medium + 5% (v/v) DMSO.

Dissociation reagent	Subculture reagents as recommended on the certificate of analysis

Subculturing

Subculture the cells at about 75 % confluence. Denser cultures undergo irreversible contact inhibition and stop proliferating. Use the subculture reagents recommended on the certificate of analysis.

Split ratio	1 to 3
Seeding density	More than 4,000 cells/cm²
Fluid renewal	24 hours after seeding, then every 48 to 72 hours
Post-thaw recovery	Post-thaw viability ≥ 70 % viable cells. More than 80 % confluence within the expected recovery period.

Thawing and culturing

Thaw the cryovial quickly in a 37 °C water bath, swirling gently. Just before the last ice has melted, move the vial to a laminar flow hood and decontaminate its outer surface.
Transfer the cell suspension into a 15 ml centrifuge tube, add 10 ml of Smooth Muscle Cell Growth Medium and centrifuge at 250 × g for 5 minutes.
Remove the supernatant and resuspend the cell pellet in 10 ml of Smooth Muscle Cell Growth Medium. Check cell number and viability.
Divide the suspension between two 25 cm² culture flasks (5 ml each). Using two flasks reduces the risk of losing all cells if a passage fails.
Incubate at 37 °C, 5 % CO_2 and saturated humidity, with the screw caps opened by half a turn for gas exchange.
Change the medium after 24 hours to remove unattached cells, then every 48 to 72 hours, using pre-warmed medium only.
Subculture the cells at about 75 % confluence. Denser cultures undergo irreversible contact inhibition and stop proliferating. Use the subculture reagents recommended on the certificate of analysis.
Recommended seeding density: more than 4,000 cells/cm².

QUALITY CONTROL AND CRYOPRESERVATION

Sterility

Mycoplasma contamination is excluded by PCR.
To ensure there is no bacterial, fungal or yeast contamination, cultures are subjected to visual inspection.

Freeze medium	As a cryopreservation medium, we use complete growth medium + 10% DMSO for adequate post-thaw viability.

Storage conditions

For long-term preservation, store vials in liquid nitrogen at about −150 to −196 °C. Storage at −80 °C is acceptable for up to one week only.

Shipping conditions

Cryopreserved primary cells are shipped on dry ice. On receipt, check the cryovial for damage and transfer it without delay to appropriate storage.

EXPRESSION AND SUSCEPTIBILITY

Protein expression

Smooth muscle α-actin; calponin; smooth muscle myosin heavy chain

Viruses

Free of HIV, Hepatitis B, Hepatitis C (confirmed negative by AddexBio)

IDENTIFIERS

Citation

Human pulmonary artery smooth muscle cells (HPASMC) (Cytion catalog number 300706)

NCBI TaxID	9606
Cellosaurus	Not assigned

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. Primary cells are of human origin, and no known test procedure can ensure the complete absence of infectious agents. Handle all products as potentially infectious.

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

PRODUCT DETAILS

Composition table