Human urothelial smooth muscle cells (HUSMC)

300707

GENERAL INFORMATION

Description

Primary Human Bladder Smooth Muscle Cells (HBdSMC) are isolated from the smooth muscle layer of the urinary tract. They are used to study the response of the bladder wall to mechanical stretch and as a building block for engineered bladder tissue.
HBdSMC respond to cyclic stretch and hydrostatic pressure that mimic bladder filling with increased proliferation and altered contractility, involving muscarinic receptor signaling. This makes them a model for detrusor remodeling in bladder outlet obstruction and for conditioning cells in bladder tissue engineering.

Tissue	Bladder
Disease	Normal bladder smooth muscle / detrusor (primary cells; non-tumorigenic)
Metastatic site	Not applicable (normal, non-tumorigenic primary cell)

Applications

Cyclic stretch of the bladder wall, muscarinic receptors and proliferation; Hydrostatic pressure in bladder outlet obstruction: proliferation and contractility; Hypoxia and oxidative stress in bladder ischemia; Rac1 signaling as a target in overactive bladder; Bladder tissue engineering with urothelial and smooth muscle cells

Synonyms

- HBdSMC
- HUSMC
- Human urothelial smooth muscle cells
- provitro 1210631

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 bladder smooth muscle cells. Not transformed or immortalized. Confirmed negative for mycoplasma, bacteria, yeast, HIV-1, HBV, HCV.

Biosafety level	1

CHARACTERISTICS

Morphology	Spindle-shaped (smooth muscle)

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Cell type	Primary smooth muscle cells
Tumourigenic	No
Doubling time	approx. 18 to 36 hours (lot-specific; AcceGen equivalent: ~13 population doublings guaranteed)

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 per AcceGen medium kit instructions. Standard SMC growth medium contains FBS (5–10%), EGF, FGF, and insulin as major components. Refer to product-specific CoA.

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

Surface antigens

α-smooth muscle actin (α-SMA) +; Desmin +; Calponin (CNN1) +; SM-MHC (MYH11) + (differentiated); h-caldesmon + (differentiated); γ-smooth muscle actin + (differentiated); Connexin 43 +

Receptors expressed

Muscarinic acetylcholine receptor M2 (CHRM2) +; Muscarinic receptor M3 (CHRM3) +; PDGFR-β (CD140b); Adrenergic receptors (β1, β3)

Viruses

Free of HIV-1, HBV, HCV (confirmed negative; AcceGen ABC-TC3862 QC)

IDENTIFIERS

Citation

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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