Human osteoblasts (HOB)

300700

GENERAL INFORMATION

Description

Primary Human Osteoblasts (HOB) are isolated from bone tissue. They are used to test the biocompatibility of implant materials such as titanium and to establish in vitro bone models.
In osteogenic culture, primary human osteoblasts show alkaline phosphatase activity and form mineralized nodules, the most widely used read-outs of bone formation in vitro. They can be combined with osteoclasts and osteocytes to model bone remodeling. Osteogenic capacity can vary between donors.

Tissue	Bone
Disease	Normal bone (osteoblast; non-tumorigenic primary cell)
Metastatic site	Not applicable (normal, non-tumorigenic primary cell)

Applications

Implant biocompatibility: plasma-treated titanium surfaces; Biocompatibility and inflammatory potential of titanium alloys; In vitro bone model: triple culture with osteoclasts and osteocytes; In vitro cytotoxicity testing of medical devices; Biophysical stimulation of osteoblast maturation and matrix mineralization; Purinergic signaling and mechanotransduction in bone formation

Synonyms

- HOB
- Human osteoblasts

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 osteoblasts isolated from bone tissue. Not transformed or immortalized.

Biosafety level	1

CHARACTERISTICS

Morphology	Polygonal to spindle-shaped (osteoblast)
Cell type	Primary osteoblasts
Tumourigenic	No

Cytion GmbH
Nikola-Tesla-Str. 3
69124 Heidelberg
Tel: +49 (0)6221 405780
info@cytion.com
cytion.com

Registered office Heidelberg
VAT ID: DE283292917
Local court Mannheim - HRB 714394
CEO / Geschäftsführer: Jonathan Steubing

Banking information
Sparkasse Heidelberg
IBAN: DE35 6725 0020 0009 2076 86
BIC: SOLADES1HDB

Doubling time	Not specified by AddexBio; typical primary osteoblast doubling time 48–72 hours

HANDLING AND CULTURE

Culture medium

Osteoblast Growth Medium kit (Cytion article number 850057); Osteoblast Growth Medium mix (Cytion article number 850056); Osteoblast Differentiation Medium kit (Cytion article number 850060)

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

Supplements

Complete growth medium (AddexBio C0013-01 all-in-one; no additional serum supplement required). For cryopreservation: complete growth medium + 10% FBS + 10% 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	Recommended seeding at 4 × 10^3 cells/cm^2 (refer to AddexBio protocol)
Seeding density	More than 2,000 cells/cm^2
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 Osteoblast Growth Medium and centrifuge at 250 × g for 5 minutes.
Remove the supernatant and resuspend the cell pellet in 10 ml of Osteoblast Growth Medium. Check cell number and viability.
Divide the suspension between two 25 cm^2 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 2,000 cells/cm^2.

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

Alkaline phosphatase (ALP); positive for bone mineralization markers

Viruses

Free of HIV, Hepatitis B, HPV, EBV, CMV (confirmed negative by AddexBio; P0004010)

IDENTIFIERS

Citation

Human osteoblasts (HOB) (Cytion catalog number 300700)

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

Cytion GmbH
Nikola-Tesla-Str. 3
69124 Heidelberg
Tel: +49 (0)6221 405780
info@cytion.com
cytion.com

Registered office Heidelberg
VAT ID: DE283292917
Local court Mannheim - HRB 714394
CEO / Geschäftsführer: Jonathan Steubing

Banking information
Sparkasse Heidelberg
IBAN: DE35 6725 0020 0009 2076 86
BIC: SOLADES1HDB