

Datasheet

# PowerStem MSC1

**Xeno- and Serum-free Medium for the Cultivation  
and Proliferation of Human Mesenchymal Stem Cells (hMSC)**

Product	Description	Catalogue-No.	Size
PowerStem MSC1	Xeno-free and serum-free medium for cultivation and expansion of mesenchymal stem cells, Kit (Basal Medium + 2 Supplements) for 500 ml	P04-77355K	500 ml

**Product description**

**PowerStem MSC1** is an easy to use xeno-free medium for *in vivo* proliferation of human mesenchymal stem cells (hMSC). PowerStem MSC1 supports long-term growth of MSC and preserves their multi-lineage potential. In addition, MSC cultured in PowerStem MSC1 expands faster and shows a significant reduction in hematopoietic cell contamination at early passages compared to serum-based media. To differentiate the proliferated MSC into different cells types the relevant protocols and differentiation factors should be used.

**Content**

PowerStem MSC1 medium consists of:

- PowerStem MSC1 basal medium (470 ml, Cat. No. P04-77350C)
- PowerStem MSC1 growth supplement 1 (5 ml, Cat. No. P04-77350S1) which is added at the time of use.
- PowerStem MSC1 growth supplement 2 (25 ml, Cat. No. P04-77350S2) which is added at the time of use.

**Storage conditions and stability:**

- PowerStem MSC1 basal medium: store in the dark at 2-8° C
- Two PowerStem MSC1 growth supplements: store in the dark at -20° C (will be shipped on dry ice, should be used immediately on arrival or may be refrozen for later use)

PowerStem MSC1 basal medium is stable for 2 years and PowerStem MSC1 growth supplements are stable for 12 months when properly stored. PowerStem MSC1 complete medium (basal + supplements) is stable for 1 month when stored in the dark at 2-8 °C. We do not recommend using the complete medium beyond one month. Do not freeze complete PowerStem MSC1 medium.

**Composition**

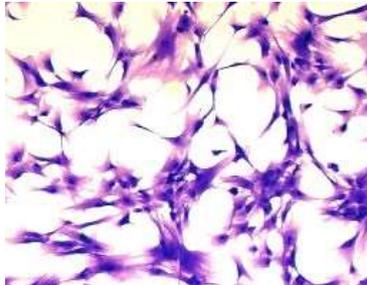
PowerStem MSC1 contains salts, amino acids, trace elements, hormones, growth factors, enriched human proteins (< 6 % w/v) and lipids in an optimized formulation.

**Suitability**

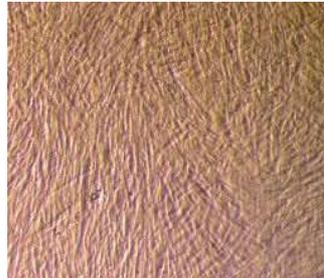
Serum-free cultivation of human mesenchymal stem cells (hMSC) while maintaining the undifferentiated state and multi-lineage potential.

### Special Advantages

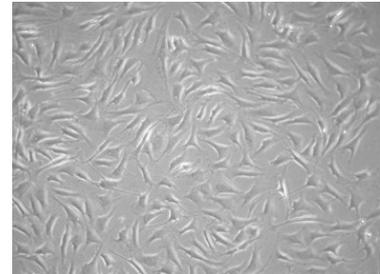
PowerStem MSC1 allows the cultivation of human mesenchymal stem cells under serum-free conditions. It is free of animal or human serum and thus enables constant and comparable experimental conditions resulting in highly reproducible data. PowerStem MSC1 is completely free of xenogenous components (xeno-free) and thus suitable for a research approach in regenerative medicine and tissue engineering. By adding specific differentiation factors, MSC can be differentiated in vitro to the desired cell types (bone, cartilage, adipose tissue etc.).



Sub-confluent hMSC in PowerStem MSC1



Confluent hMSC in PowerStem MSC1



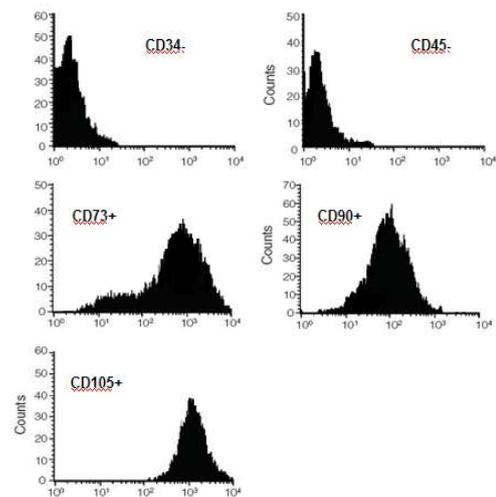
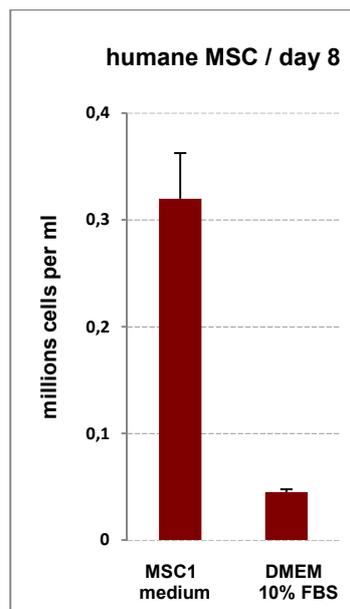
hMSC in medium with 10% FBS

### humane MSC proliferation

Picture is showing the average of three independent experiments. Growth conditions: 2000 cells per ml / growth area 1.9 cm<sup>2</sup>.

During the growth phase medium was not changed.

After 8 days the cell density was determined



The culture-expanded cell population expresses CD90 (Thy-1), CD105 (SH2) and CD73 (SH3/SH4), but lacks expression of CD34 and CD45.

### Preparation of PowerStem MSC1 medium

PowerStem MSC1 basal medium requires supplementation with PowerStem MSC1 growth supplements. Thaw PowerStem MSC1 growth supplements before use. The thawed growth supplements should be added to the basal medium immediately. PowerStem MSC1 complete medium (basal medium with growth supplements) is stable for 1 month when stored in the dark at 2-8° C.

Antibiotics can be used if desired, we recommend Gentamicin Reagent Solution (5 µg/mL final concentration).

**Culture Conditions**

Media: Complete PowerStem MSC1 medium

Cell- Line(s): Human mesenchymal stem cells (hMSC), adipose-derived stem cells (ADSC) or ASC/TERT1.

Culture Type: Adherent

Culture Vessels: CELLstart™ CTS™-coated T-Flasks.

Temperature Range: 36°C to 38°C

Incubator Atmosphere: Humidified atmosphere of 4–6 % CO<sub>2</sub> in air.

Ensure proper gas exchange and minimize exposure of cultures to light.

Note: Procedures detailed in the following sections are for cultures in T-75 culture flasks (75 cm<sup>2</sup>).

Volumes should be adjusted accordingly for desired vessel size.

**Recovery**

- Rapidly thaw (<1 minute) frozen cells in a 37°C water bath.
- Pipette the entire content of the cryovial in a sterile 50-ml conical tube.
- Add carefully 5–10 ml of pre-warmed (37°C) complete PowerStem MSC1 medium.
- Ensure homogeneity of the cell suspension by regular gentle blending the tube.
- Centrifuge cell suspension at 100–200 × g for 5 minutes at room temperature.
- Aspirate and discard supernatant being careful not to disturb the cell pellet.
- Resuspend the cell pellet in a minimal volume of pre-warmed complete PowerStem MSC1 medium for cell counting. Determine total viable cell density. Calculate the volume of cell suspension required to seed cells at a density of approximately 5 × 10<sup>3</sup> cells/cm<sup>2</sup>.
- Add cell suspension to an appropriate PowerStem MSC1 coated T-75 flask containing 10–15 ml pre-warmed complete PowerStem MSC1 medium.
- Incubate at 37°C in a humidified atmosphere of 5 % CO<sub>2</sub> in air.
- Replace the medium in the flasks every 3–4 day.

**Coating Culture Flasks with Fibronectin-Solution**

Coating of cell culture vessels using Fibronectin - attachment factor (2705001S PAN-Biotech).

- Fibronectin working concentration 1-5 µg/cm<sup>2</sup>
- Coat the bottom of cell culture flask with solution
- ensure complete surface coverage
- incubate for 2 hours at 37° C
- Aspirate remaining solution
- Let dry for 30 minutes under tissue hood.

Optimal conditions for attachment must be determined for each cell line and application.

**Subculture in PowerStem MSC1**

- Observe stock culture with microscope and confirm that the cells are ready to be subcultured (60–80 % confluent).
- Aspirate spent medium and wash 2x with 5 ml of DPBS (without Mg<sup>2+</sup>/Ca<sup>2+</sup>) per T25 flask; adjust volume according to size of culture vessel (e.g. 10 ml per T75, 1 ml per 24-well etc.).
- Add Accutase (P10-21100 Pan-Biotech) to culture vessel (5 ml per T25) in aseptic procedure.
- Dispense enough Accutase solution into culture vessel(s) to completely cover the monolayer of cells 1-2 minutes than remove excess Accutase solution.
- Cells detach at room temperature within 5 to 10 min.
- Tap flask to release cells.
- Resuspend cells in fresh cell culture medium and determine cell amount by trypan blue exclusion staining.
- Split cells to desired cell density and transfer to a new culture vessel.
- Incubate at 37°C in a humidified CO<sub>2</sub> incubator.

**NOTE:** For embryonic stem cell cultures and cells cultured under serum-free conditions, a washing step is recommended to remove excess Accutase from cells; spin down cells as usual (e.g. 5 min at 200-300 g) remove Accutase and resuspend in fresh medium.

**Technical support**

For technical support, questions or remarks please contact your local PAN-Biotech partner or the technical department of PAN-Biotech via email ([info@pan-biotech.com](mailto:info@pan-biotech.com)) or phone +49-8543-601630.

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