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# Product Information

## Rat Mesenchymal Stem Cells - Bone Marrow (RMSC-bm)

| | | | |
|---|---|---|---|
| Catalog Number | 10RA-023 | Cell Number | 0.5 x $10^6$ cells/vial |
| Species | *Rattus norvegicus* | Storage Temperature | Liquid Nitrogen |

## Description

Mesenchymal stem cells (MSC) are a well-characterized population of adult stem cells. They have the potential to develop into mature cells that produce fat, cartilage, bone, tendons, and muscle [1, 2]. The developmental plasticity of MSC has generated tremendous interest because of the potential use of mesenchymal stem cells in regenerative medicine to replace damaged tissues. MSC cultured without serum in the presence of transformation growth factors will differentiate into chondrocytes. In contrast, MSC cultured in serum with ascorbic acid and dexamethasone will differentiate into osteoblasts. With their renewal capability, MSC have the potential to be transplanted into an injured site or seeded on a biomimetic scaffold to generate appropriate tissue constructs.

iXCells Biotechnologies provides high quality Rat Mesenchymal Stem Cells - Bone Marrow (RMSC-bm), which are isolated from adult rat bone marrow and cryopreserved at P1, with >0.5 million cells in each vial. RMSC-bm are positive for CD29, CD73, CD90, CD105, and negative for CD34, CD45. These cells are also characterized by lipid staining after differentiation. RMSC-bm are negative for HIV-1, HBV, HCV, mycoplasma, bacteria, yeast, and fungi and can further

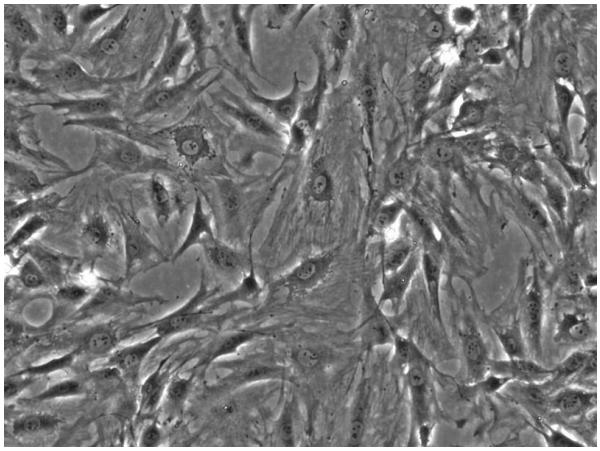

**Figure 1.** Rat MSCs from bone marrow (phase contrast).

expand for 3-4 population doublings in Mesenchymal Stem Cell Medium (Cat# MD-0037) without losing their multipotent properties.

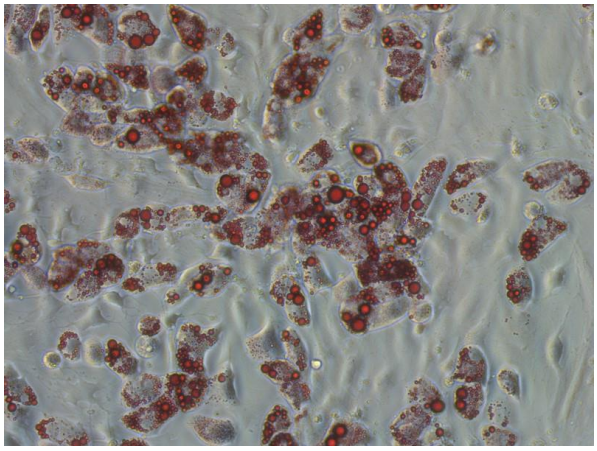

**Figure 2.** Adipocyte differentiation from Rat MSC-bone marrow (oil red staining, Day 14 post adipogenic induction).

## Product Details

| | |
|---|---|
| **Tissue** | Sprague-Dawley rat bone marrow |
| **Package Size** | $0.5x10^6$ cells/vial |
| **Passage Number** | P1 |
| **Shipped** | Cryopreserved |
| **Storage** | Liquid nitrogen |
| **Growth Properties** | Adherent |
| **Media** | Mesenchymal Stem Cell Medium (Cat# MD-0037)<br>Adipocyte Differentiation Medium (Cat# MD-0005) |

## Protocols

### Thawing of Frozen Cells

1. Upon receipt of the frozen RMSC, it is recommended to thaw the cells and initiate the culture immediately in order to retain the highest cell viability.
2. To thaw the cells, put the vial in 37°C water bath with gentle agitation for ~1 minute. Keep the cap out of water to minimize the risk of contamination.
3. Pipette the cells into a 15ml conical tube with 5ml fresh Mesenchymal Stem Cell Medium (Cat# MD-0037).
4. Centrifuge at 1000rpm (~220g) for 5 minutes under room temperature.

5. Remove the supernatant and resuspend the cells in fresh Mesenchymal Stem Cell Medium (Cat# MD-0037).
6. Culture the cell in T75 flask or 100mm dish.

**Safety Precaution:** *it is highly recommended that protective gloves and clothing should be used when handling frozen vials.*

## Standard Culture Procedure

1. RMSC can be cultured in Mesenchymal Stem Cell Medium (Cat# MD-0037).
2. When cells reach ~80-90% confluence, remove the medium, and wash once with sterile PBS (5ml/T75 flask).
3. Add ~2.5ml of 0.25% Trypsin-EDTA to the flask and incubate for ~3 minutes at 37°C. Neutralize the enzyme by adding 2-3 volumes of cell culture medium.
4. Centrifuge 1000rpm (~220g) for 5min and resuspend the cells in desired volume of medium.
5. Seed new culture vessels at $5 \times 10^3$ cells/$cm^2$.

## Adipocyte Differentiation Protocol (12 well plate format)

1. Grow RMSC in Mesenchymal Stem Cell Medium (Cat# MD-0037) to >95% confluency.
2. Aspirate the growth medium and replace with 1.5 ml fresh growth medium/well, let the cells grow for 2~3 more days.
3. Aspirate the growth medium, apply 1.5 ml Adipocyte Differentiation Medium (Cat# MD-0005) per well to the cells.

   **Note:** Cells at this stage may detach from dish easily, so do not use pump to aspirate off the medium at this step. Use pipet and slowly remove the medium instead. Add Adipocyte Differentiation Medium very gently to avoid cell detachment.
4. Change fresh Adipocytes Differentiation Medium every 3 days (slowly remove and add the medium as described above).
5. Culture the cells in Adipocytes Differentiation Medium for 10-14 days, and analyze the percentage of cells with oil-droplet formation by Oil Red O Staining (Figure 2).

# References

[1] Kassem, M. Mesenchymal stem cells: biological characteristics and potential clinical applications. 2004. Cloning Stem Cells. 6(4):369-74.

[2] Barry, F. P., and J. M. Murphy. Mesenchymal stem cells: clinical applications and biological characterization. 2004. Int J Biochem Cell Biol. 36(4):568-84.

## Disclaimers