

## Certificate of Analysis

### Human Mesenchymal Stem Cells

Catalog No. HUXMA-01001

Lot Number: 130405F01

Cryopreservation Date: 2013-04-05

Passage Number: 2

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### Viability

Cells are assayed for viability post-thaw using vital staining assay with trypan blue.

Specification: Cells should exhibit  $\geq 80\%$  viability.

### Sterility

Bacterial and Fungal Contamination: Samples are inoculated and cultured in blood agar plate, thioglycolate broth, tryptocase soy broth and sabouraud dextrose agar.

Specification: No growth must be observed.

Mycoplasma: Samples are tested for mycoplasma contamination using a PCR-based assay and direct culture.

Specification: Results must be negative.

Endotoxin: Samples are tested for endotoxin contamination with LAL test.

Specification: Results must show  $\leq 10\text{EU/ml}$ .

Exogenous Virus: Samples using ELISA assay to detect HIV, HBV, HCV and Syphilis.

Specification: Results must be negative.

### Purity

Cells are assayed for purity using flow cytometric analysis of cell surface antigen expression after cryopreservation. Cells are immunofluorescently stained with fluorochrome-conjugated antibodies specific to cell surface antigens CD29, CD105, CD44, CD45 and CD34.

Specification: Cells must show  $\geq 70\%$  positivity for expression of cell surface antigens CD29, CD44 and CD105. Cells must show  $\leq 5\%$  positivity for expression of cell surface antigens CD34 and CD45.

### Proliferation Ability

Cells are characterized by their ability to proliferate in culture with an attached well-spread morphology for  $\geq 5$  passages, and  $\leq 5\%$  cells exhibit spontaneous differentiation in each passage.

### Differentiation Ability

Cells are assayed after cryopreservation for their ability of tri-lineage differentiation. Cells must be able to differentiate to osteocytes, adipocytes and chondrocytes when cultured in the appropriate differentiation media.

**Results:**

All specifications have been met.

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