vitality

Human Mesenchymal Stem Cells

Mesenchymal Stem Cells (MSC) are multipotent cells with the ability to differentiate into a variety of cell types. They have been used in research for a number of years with the most common source tissues being human bone marrow and adipose tissue. However recent research suggests the differentiation capabilities of MSCs of different origins vary considerably.

Vitality provide MSCs from a range of origins as listed below:

- hMSCs from adipose tissue (hADSCs)
- hMSCs from placenta (hPSCs) - from Amnion, Decidua or Chorion Villi
- hNCSCs (neural crest-derived stem cells) from skin
- hMSCs from umbilical cord (hUC-MSCs)
- hMSCs from endometrium (hEnMSCs)
- hUCAs-MSCs Human Umbilical Cord Arteries MSCs

Rigid quality control is carried out for every lot of MSCs produced:

Cell morphology, proliferation potential, adherence rate, sphere forming, and viability.

Cytometric analysis with a comprehensive panel of markers.

Differentiation assays (adipogenic, osteogenic and chondrogenic).

Testing for the absence of multiple diseases

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hMSCs from adipose tissue (hADSCs)

hADSCs have been shown to differentiate in vitro or in vivo into adipocytes, chondrocytes, osteoblasts, myocytes, neurons, hepatocytes, and pancreatic islet cells. hADSCs are harvested from normal human adipose tissue from individual donors and are provided in a cryopreserved format. The cells are tested for their ability to differentiate in vitro into adipocytes, chondrocytes, and osteoblasts and for a verified marker expression profile that complies with ISCT recommendations, providing well characterized cells.

hMSCs from placenta (hPSCs) - from Amnion, Decidua or Chorion Villi

hMSCs have emerged as a promising regenerative tool, owing mainly to their multi-differentiation potential and immunosuppressive capacity. MSCs of neonatal origins exhibit superior proliferation ability, lower immunogenicity, and are expected to show lower incorporated mutation. hMSCs are isolated from three neonatal tissues, namely amniotic membrane, Chorion Villi, and Decidua tissue of the human placenta from the same donor.

hNCSCs (neural crest-derived stem cells) from skin

hNCSCs have extensive migratory capacity and multipotency, harbouring stem cell-like characteristics such as self-renewal. They can differentiate into a variety of cell types from craniofacial skeletal tissues to the trunk peripheral nervous system (PNS). hNCSCs are isolated from the skin dermis of normal human donors during minimally invasive biopsy procedure.

hUC-MSCs (hMSCs from umbilical cord)

hUC-MSCs strongly express MSC surface markers similar to Bone Marrow Stem Cells. Under optimal growth conditions, Umbical Cord-Derived Mesenchymal Stem Cells have been shown to be multipotent, capable of differentiating down adipogenic, osteogenic and chondrogenic lineages. The harvesting procedure is non-invasive, with umbilical cords obtained from women with healthy pregnancies during caesarean deliveries at the end of gestation.

hEnMSCs (hMSCs from endometrium)

The human endometrium is a highly dynamic tissue that undergoes approximately 400 menstrual cycles during a woman's lifetime. This level of tissue regeneration is comparable to other tissues with high cellular turnover, such as epidermis, gut epithelium, and bone marrow. hEnMSCs are obtained through an endometrial biopsy, from women during a minimally invasive biopsy procedure.

hUCAs-MSCs (Human Umbilical Cord Arteries MSCs)

hUCAs-MSCs are specifically taken from umbilical cord artery tissues. Differentiation studies have shown variation between the cord regions, meaning that for some studies MSCs from specific cord regions may be of interest. The harvesting procedure is non-invasive, with umbilical cords obtained from women with healthy pregnancies during caesarean deliveries at the end of gestation.

All Human Mesenchymal Stem Cells are collected with full informed consent.

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