

Enrichment of Mesenchymal Stem Cells (MSCs) from Bone Marrow

Overview

Bone Marrow derived mesenchymal stem cells (BM-MSCs) are one of the most well studied stem cells population due to their unique characteristics and therapeutic potential.

BM-MSCs are normally isolated by adherence, but one of the disadvantage is the non-specificity of this approach. MSCs are a rare fraction and many other cell types attach to the plate affecting the stem cell culture. Prolonged culture is necessary to obtain a pure MSCs population, with consequent ageing and possible modification of the cells due to contact with other cell types.

Celector® **separates sample in its cell components** and concentrates mesenchymal stem cells from fresh Bone Marrow with high purity and viability.

- **Enrichment** of BM-MSCs from fresh Bone Marrow concentrate;

Details

- **High reproducibility** between patients;

- **Separation** of red blood cells, differentiated cells and monocytes, resulting in a homogeneous mesenchymal stem cell culture;

- **Sterility and viability maintained**

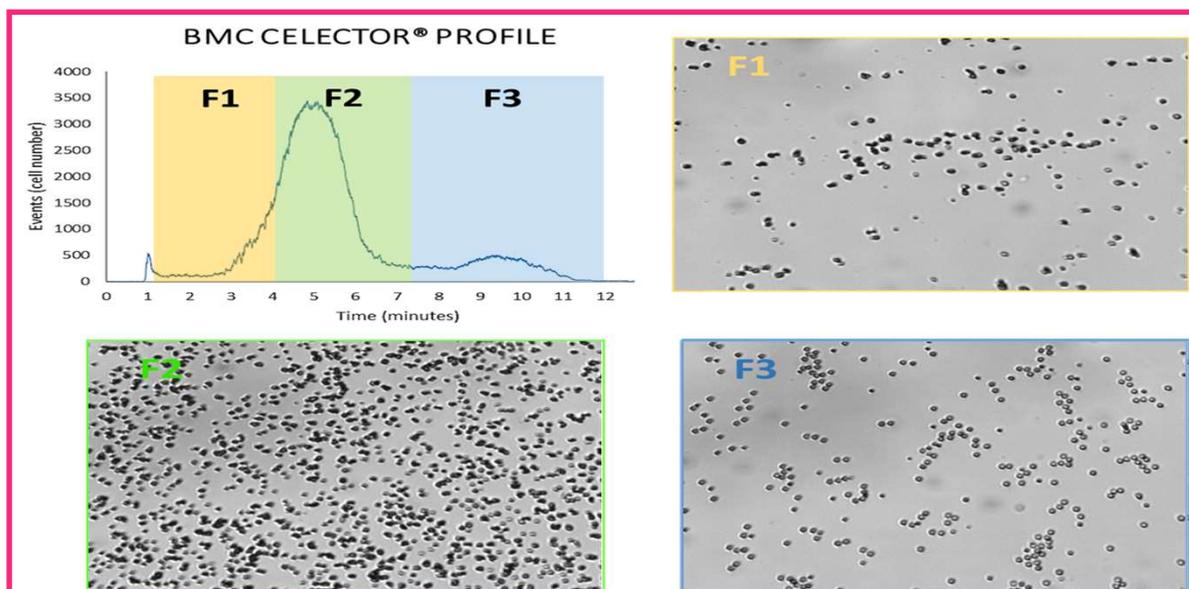


Figure 1. Bone Marrow mononuclear cells analyzed by Celector®. Images show the representative screenshots of passing cells in the three different fractions (F1 ~ 3 minutes, F2 ~ 6 minutes and F3 ~ 11 minutes). The graphic shows the number of cell events passing under the optical system versus the time in minutes.



Stem Sel®

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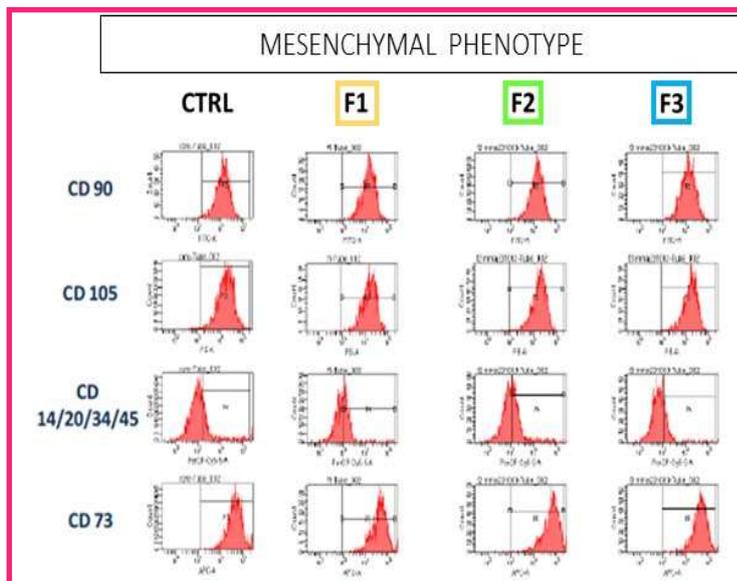
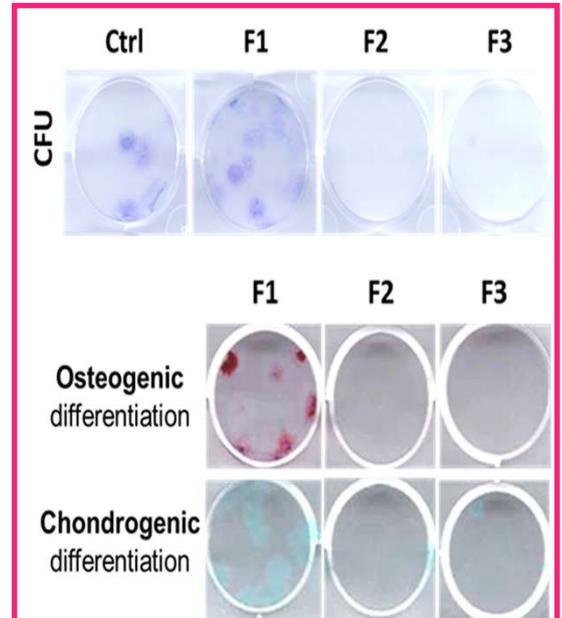
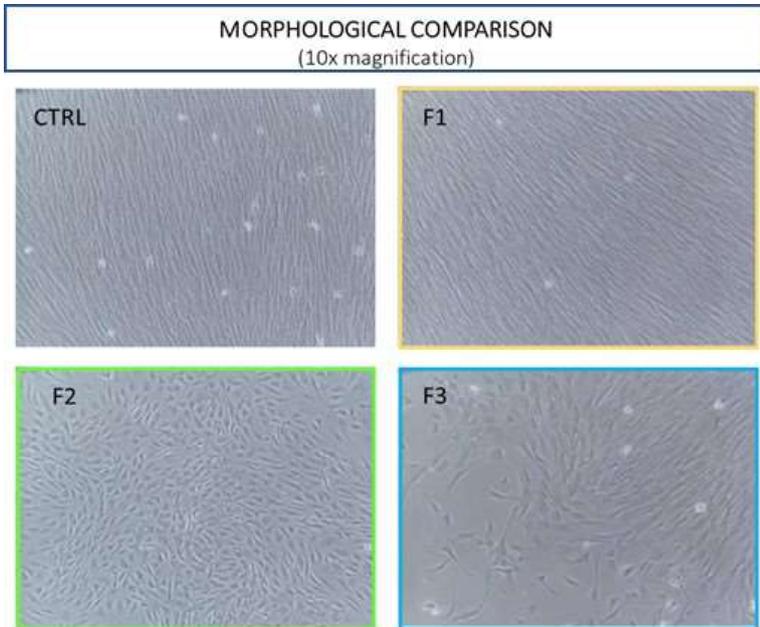


Figure 2. Morphological comparison between fractions and non-passed control. F1 cells in culture are similar to the control (untreated with Celecator®), maintaining an elongated form typical of mesenchymal cells.

Figure 3. Colony forming unit (CFU) assay and differentiation tests on cells isolated from fractions derived by Celecator® analysis.

Cells isolated from F1 show a higher number of CFUs, as well as a higher potential/plasticity through osteogenic and chondrogenic lineages, compared to the control sample (cells isolated by adherence) and the other two fractions (F2, F3).

Figure 5. Phenotypical analysis performed with Flow Cytometry.

Typical marker of mesenchymal cells (CD73, CD90 and CD105) are present in every fractions with no significant differences between fractions and control.

Applications

- **Enrichment** of Mesenchymal Stem cells from clinical Bone Marrow samples;
- **Depletion** of red blood cells and monocytes from the raw sample;
- **Quality control (QC)** of clinical samples;
- Isolation of BM-MSCs for **regenerative medicine and tissue repair studies**



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