

## **Comparative characterization of murine Bone marrow mesenchymal stem cells cultured using two different supplements**

### **ABSTRACT**

Preclinical studies on mesenchymal stem cells (MSC) have allowed the cells to be considered as a promising candidate for cellular therapy. The mouse is the most widely used species for studying the characteristics of MSC. In recent years, conflicting data were reported regarding growth kinetics, surface marker profile, differentiation capacity, genetic instability or malignant transformation and so forth, that may be a result of a range of factors. One of the factors probably is the culture medium formulation. Here we have made a comparative characterization of bone marrow-derived mesenchymal stem cells (mBM-MSC), under the same experimental conditions, cultured using two common supplements, fetal bovine serum (FBS) and MesenCult™ Stimulatory Supplement (MSS). mBM-MSC isolated from the tibias of C57BL/6 mice were cultured and expanded in Dulbecco's Modified Eagle's Medium supplemented with either 15% FBS or 15% MSS. Clonogenic potential, population doubling time, immunophenotyping, differentiation immunosuppression potentials and chromosome analysis of early and late passage of mBM-MSC were assessed. The findings showed that the immunophenotype and differentiation potential of mBM-MSC were similar when cultured using these supplements irrespective of passages. Variations were seen in clonogenic, growth, proliferation rate and immunosuppression potential of the mBM-MSC. This study also revealed that prolonged culture will disrupt their genetic stability regardless of the supplements used. The genetically mutated mBM-MSC were also found to maintain their stemness characteristics and immunosuppression potential. In conclusion, culture medium formulation causes variations in the cultured MSC and may influence downstream investigation findings.

**Keyword:** Stem cells