
The Extracellular Matrix (ECM) Affected Proliferation and Cell Adhesion of Human Adipose Tissue Derived Mesenchymal Stem Cells (hAD-MSCs) *in Vitro*

Departments of Surgery, Severance Hospital, Yonsei University College of Medicine¹,
Guro Hospital, Korea University College of Medicine², Seoul, Korea

Sun Ok Min¹, Sang Woo Lee¹, Sae Byeol Choi², Kyung Sik Kim¹

Introduction: The human Mesenchymal stem cells (hMSCs) have the potency of selfrenewing and differentiation into various kinds of cells. Extracellular matrix (ECM) is an important factor that affects cell adherence, growth, migration, apoptosis, and differentiation *in vitro* and *vivo*.

Purpose: The Adipose-derived mesenchymal stem cells (AD-MSCs) have CD29 (integrin) which is the receptor for ECM-protein on the cell surface. The aim of this study is to validate the efficacy of ECM especially fibronectin and matrigel for cell expansions.

Materials and Methods: AD-MSCs were obtained from the abdominal fat of human. These cells were seeded onto culture plates coated with fibronectin-Human (FN), matrigel basement membrane (M-BMM), collagen type I and plates without ECM (control).

Results: hAD-MSCs in FN and M-BMM coated and non-coated plate exhibited cytoplasm staining for integrin-beta1. In all cultures, the extended fibroblastic-shaped cells that turned into rhomboid cells are most frequently observed. The cell growth rates in non coated culture plate were lower than those in FN and M-BMM coated plates. Passage3 and passage5 at After 72 hour culture under the different coated concentrations of FN, M-BMM, collagen and non coated condition (control), the control group has a lower growth rate. In a culture with FN and M-BMM coated plate, a significant change was observed in comparison to the control group. We observed an increase in cell proliferation with a maximum 140% at FN coated and 130% at M-BMM coated by proliferation assays.

Conclusion: The cell morphology can be changed faster in the FN, matrigel, collagen coated culture plates than in not coated culture plates. Because proliferation and adhesion with FN, matrigel can be enhanced for the expansion, the culture within FN coated plate is needed to ncourage hAD-MSCs proliferation *in vitro*.