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Properties of Immune-Related Genes in Human Amnion-Derived Stem Cells

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Objectives: Mesenchymal stem cells (MSC) of human bone marrow are known not to express HLA class II antigens of the cell surface. In this study, we obtained MSC-like stem cells from human amniotic membrane and investigated their immunologic properties in relation to the cryopreservation and differentiation along three lineages: adipocytes, osteocytes and chondrocytes.

Methods: Human amnion-derived stem cells (HAM) were isolated from the amnion after a Caesarean section and cultured in DMEM supplemented with 10% FBS. Immunologic properties of HAM were examined using RT-PCR and immunocytochemistry.

Results: RT-PCR analysis showed that two specimens of HAM consistently expressed genes of 2M, CD40, CD59, TAP-1 and TAP-2, regardless of the passage number, but CD80 and CD86, both which are necessary for instigation of T cell proliferation, and HLA DM genes were never expressed throughout the culture period. Interestingly, HLA ABC and HLA DR genes were expressed until 3 to 4 passages but not in later passages. Cryopreserved HAM after thawing showed similar expression profiles to those of HAM that were not frozen. In vitro differentiation of HAM into three mesodermal lineages including adipocytes, osteocytes or chondrocytes did not alter the expression profiles of the same genes.

Conclusion: HAM do not express many immune-related genes and this property was not changed by cryopreservation and differentiation into mesodermal lineages. These findings suggest that HAM could be transplantable therapeutic cells between HLA-incompatible individuals.