Immunomodulatory and immunogenic properties of mesenchymal stem cells derived from bovine fetal bone marrow and adipose tissue

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Little information is currently available on therapeutic features of bovine mesenchymal stem cells (MSCs), despite the development of large animal experimental models including cattle may open alternative strategies for investigating MSC physiology and eventual applications for regenerative therapy. The aim of the present study was to compare in vitro immunomodulatory and immunogenic potentials of bovine fetal MSCs (bfMSCs) derived from bovine fetal bone marrow (BM-MSCs) and adipose tissue (AT-MSCs). Immunomodulatory analyses in bfMSCs were performed by determination of the effect of interferon-? (IFN?) on mRNA levels of indoleamine 2, 3-dioxygenase (IDO), transforming growth factor ?1 (TGF?1), prostaglandin E receptor 2 (PTGER2), interleukin-6 and -10 (IL-6 and IL-10), and IDO enzymatic activity. The effect of conditioned medium from IFN?-stimulated bfMSCs on the proliferation of alloantigen-activated peripheral blood lymphocytes (PBLs) was assessed. Immunogenicity of bfMSCs was determined by quantification of mRNA levels of major histocompatibility complex I and II (MHC-I and -II), CD80 and CD86, and the proportion of cells positive for MHC-I and -II by flowcytometry (FACS) analyses. IFN? treatment increased IL-6, PTGER2 and IDO gene expression and activity in bfMSCs but did not affect suppressive effect on proliferation of PBLs. Lower proportion of AT-MSCs expressed MHC-I and MHC-II in comparison to BM-MSCs. In conclusion, BM-MSCs and AT-MSCs upregulated expression of immunomodulatory genes in a similar way after IFN? stimuli. BM-MSCs and AT-MSCs in basal condition and treated

with IFN? displayed similar in vitro immunomodulatory ability. Lower expression of MHC-I and MHC-II suggest that AT-MSCs might be less immunogenic compared to BM-MSCs.