Supplementary Data

Supplementary Materials and Methods

Gene expression of adipogenic and osteogenic differentiation cultures

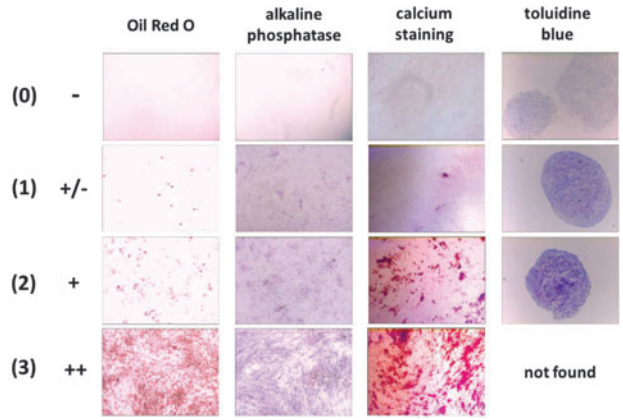
Bone marrow-derived mesenchymal stromal cells and Wharton's jelly mesenchymal stromal cells were cultured for 2 weeks in specific adipogenic and osteogenic differentiation media or normal mesenchymal stromal cell medium (control); the cells of the cultures were lysed and RNA was isolated using the Direct-zol RNA Miniprep Kit (Zymo Research). cDNA was subsequently prepared using the high-capacity RNA to cDNA Kit (Life Technologies). Expression of osteogenic and adipogenic genes was analyzed using TaqMan Gene Expression assays (see next paragraph) and the ViiA 7 Real-Time PCR system (Life Technologies). Relative expression of the genes was calculated with the $\Delta\Delta$Ct method normalized to RPL13a.

Osteogenic genes

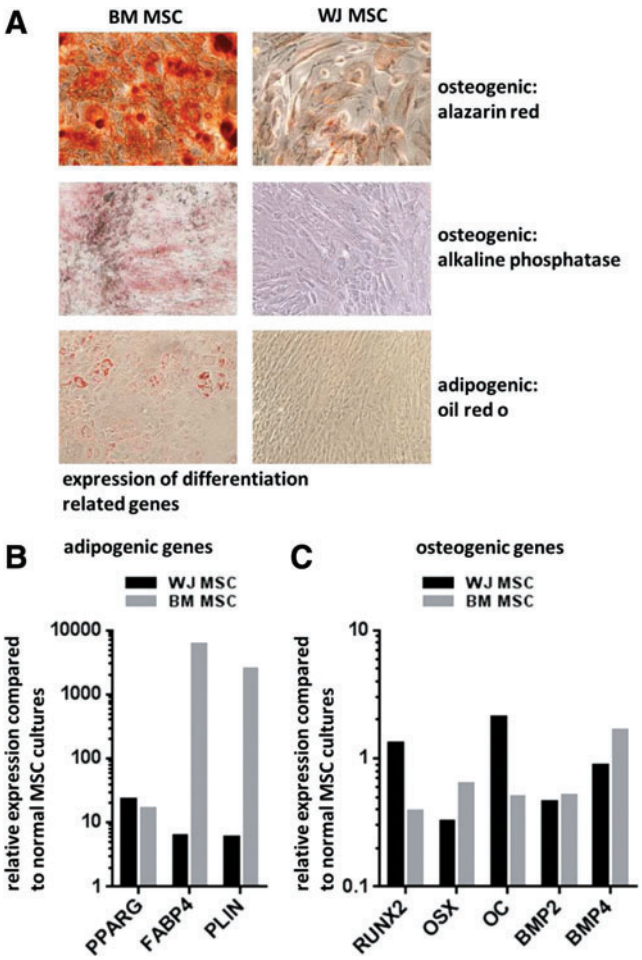
Runt-related transcription factor 2 (RUNX2, Hs00231692_m1)
Osterix (OSX, Hs01866874_s1)
Osteocalcin (OC, Hs01587814_g1
Bone morphogenetic protein 2 (BMP2, Hs00154192_m1)
Bone morphogenetic protein 2 (BMP4, Hs03676628_s1)

Adipogenic genes

Peroxisome proliferator-activated receptor-gamma (PPARg, Hs01115513_m1)
Fatty acid-binding protein 4 (FABP4, Hs01086177_m1)
Perilipin (PLIN, Hs00160173_m1)



SUPPLEMENTARY FIG. S1. Scoring system of the degree of differentiation of WJ MSCs or BM MSCs into three mesodermal lineages. The degree of staining was assessed for all differentiation cultures of all donors and compared to reference stains to determine the level of staining. 0, no differentiated cells; 1, <20% differentiated cells d; 2, <60% differentiated cells; 3, >60% differentiated cells. BM MSCs, bone marrow-derived mesenchymal stromal cells; WJ MSCs, Wharton's jelly mesenchymal stromal cells.



SUPPLEMENTARY FIG. S2. Differentiation cultures of BM and WJ MSCs. **(A)** Staining of the differentiation cultures for cell specific markers/deposits of osteoblasts (Alizarin Red and alkaline phosphatase) and adipocytes (Oil Red O). **(B)** Relative expression of adipogenic genes by BM MSCs and WJ MSCs after adipogenic differentiation cultures. Shown is the difference in up or downregulation of the genes by MSCs in differentiation cultures compared to cultures in normal MSC medium ($2^{\Delta\Delta Ct}$, normalized to *RPL13a*). **(C)** Relative expression of osteogenic genes by BM MSCs and WJ MSCs after osteogenic differentiation cultures. Shown is the difference in up or downregulation of the genes by MSC in differentiation cultures compared to cultures in normal MSC medium ($2^{\Delta\Delta Ct}$, normalized to *RPL13a*).