**Isolation, culture of hPMSCs**

The use of human tissue was approved by the Institutional Ethics Committee. Human placentas were collected from pregnant women who were negative for HIV-I, hepatitis B, and hepatitis C under written and informed consent. The placentas were mechanically minced and digested with 0.1% collagenase IV (Gibco) for 30 min at 37℃. The 100 mm nylon membranes were used to remove undigested tissue fragments. Cells were collected and then centrifuged at 1000g for 10 min to remove the harvest buffer. The isolated cells were resuspended in low glucose Dulbecco’s modified Eagle’s Medium (DMEM, Gibco) supplemented with 10% fetal bovine serum (FBS) and were cultured at 37℃ in a humidified atmosphere with 5% CO2. Cell morphology was observed under light microscope (Olympus, Japan). For osteogenic differentiation, alizarin red staining was used to identify osteoblast-like cells. For adipogenic differentiation, Oil Red O staining was used to identify adipose cells. Additionally, the membrane and intracytoplasmic molecular markers of hPMSCs were examined using flow cytometry (FCM) to confirm the phenotype of hPMSCs. Following staining the cells with specific hPMSCs surface molecules antibody with phycoerythrin-conjugated or fluorescein isothiocyanate-conjugated mouse anti-human CD19, CD73, CD105, CD90, CD34, HLA-DR and CD14 mAb (BD Biosciences and Invitrogen), the cells were sorted with cytometry and harvested for culture.