Figure S1. Expression of cell surface maker on BM-MSC by FACS. BM-MSCs ($1x10^6$) from the young and the old were analyzed by flow cytometry analysis. Cells were treated with fluorescein isothiocyanate-conjugated antibodies against CD29, CD105, CD73, CD90 and CD44 for 15 min at 4˚C in the dark. After washing with buffer twice, cells were re-suspended with buffer and analyzed with FACS Acccuri software (BD Biosciences; Becton Dickinson and Company). CD, cluster of differentiation; FACS, fluorescence activated cell sorting; BM-MSCs, bone marrow-mesenchymal stem cells.

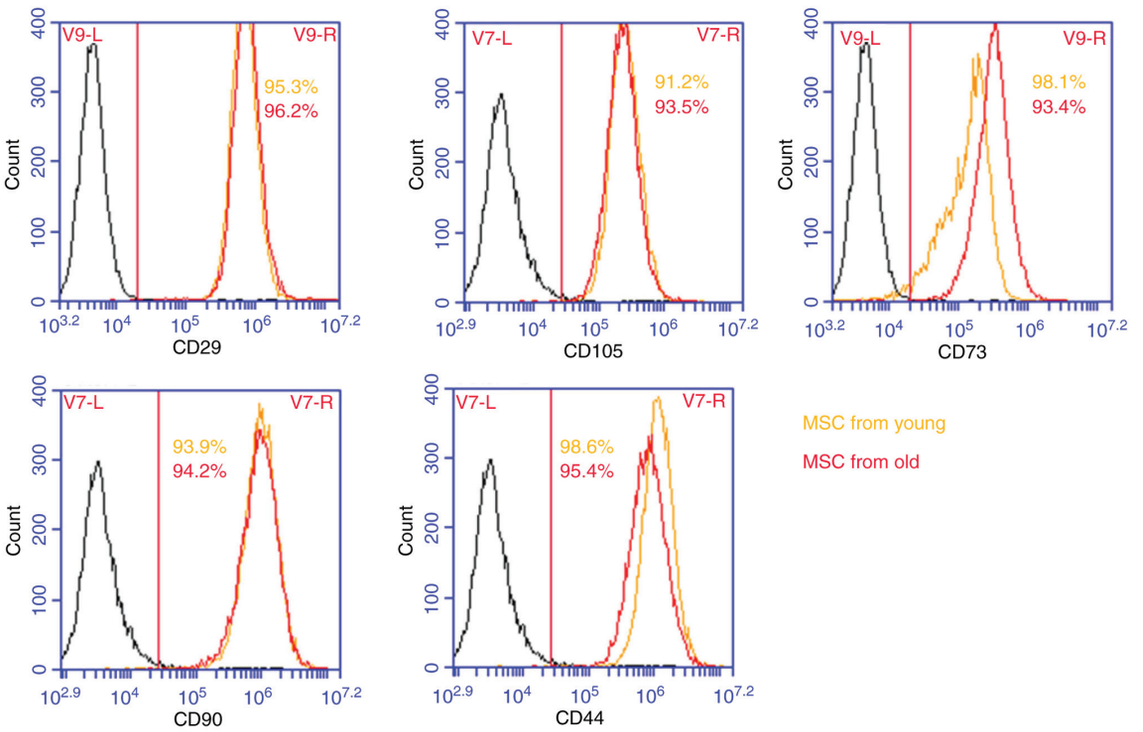

Figure S2. Differentiation of BM-MSCs from young and old patients. BM-MSCs were seeded into 6 well ($1x10^5$/well) and then cultured in differentiation induction medium (osteogenic, adipogenic and chondrogenic medium) for 2-3 weeks. (A) Oil red O staining for lipid drop; (B) alizarin red staining for calcium deposit; (C) western blotting for collagen type 2. BM-MSCs, bone marrow-mesenchymal stem cells.

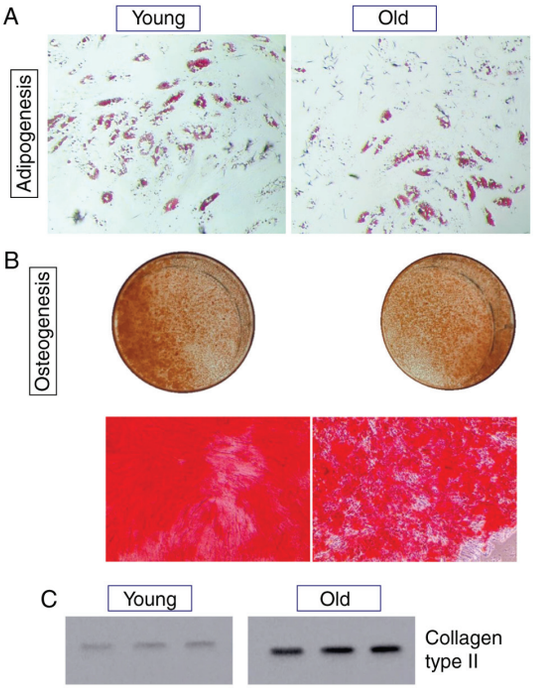

Figure S3. The effect of rEMS treatment on expression of cell surface makers on BM-MSCs. BM-MSCs ($1x10^6$, the old) were stimulated with rEMS treatment and then, analyzed by flow cytometry analysis. Cells were treated with fluorescein isothiocyanate-conjugated antibodies against CD29, CD90, CD73, HLA-DR and CD34 for 10 min at 4˚C in the dark. After washing with buffer twice, cells were re-suspended with buffer and analyzed with FACSCalibur using CellQuest software (BD Biosciences; Becton Dickinson and Company). BM-MSCs, bone marrow-mesenchymal stem cells. CD, cluster of differentiation; FACS, fluorescence activated cell sorting; rEMS, repetitive electromagnetic stimulation; HLA, human leukocyte antigen.

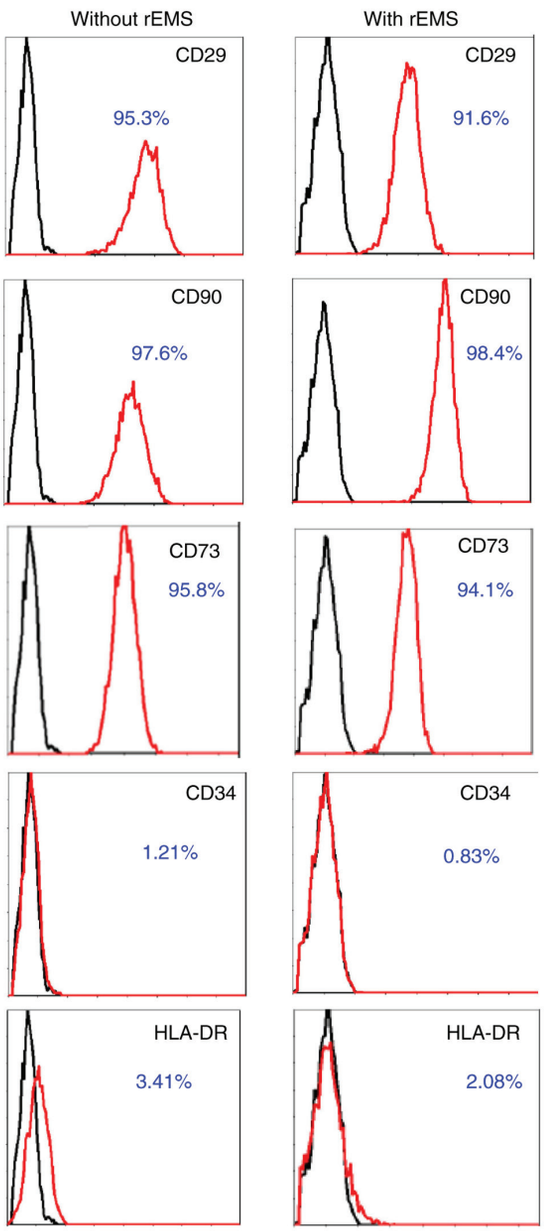

Table SI. Characteristics of the study subjects.

| Characteristic | Younger (<50 years) | Older (>55 years) |
|---|---|---|
| Subjects, n | 21 | 30 |
| Age, years | 40±10.09 | 69.6±7.4 |
| Sex, M/F | 12/9 | 19/11 |

M, male; F, female.