Electronic Supplementary Material (ESI) for Journal of Materials Chemistry B.

Supporting information

Cell adhesion analysis

The samples were stained with FITC and imaged using fluorescence microscope. Eight 10× images from different fields were chosen for statistics analysis using image processing software (ImageJ, National Institutes of Health, USA). The images of MSCs adhering on different -OH/-CH_3 mixed SAMs after 12 h of culture were presented in Fig. S1. The spreading of MSCs was quantified by measuring the areas of more than two hundred cells and showed in Fig. S2.

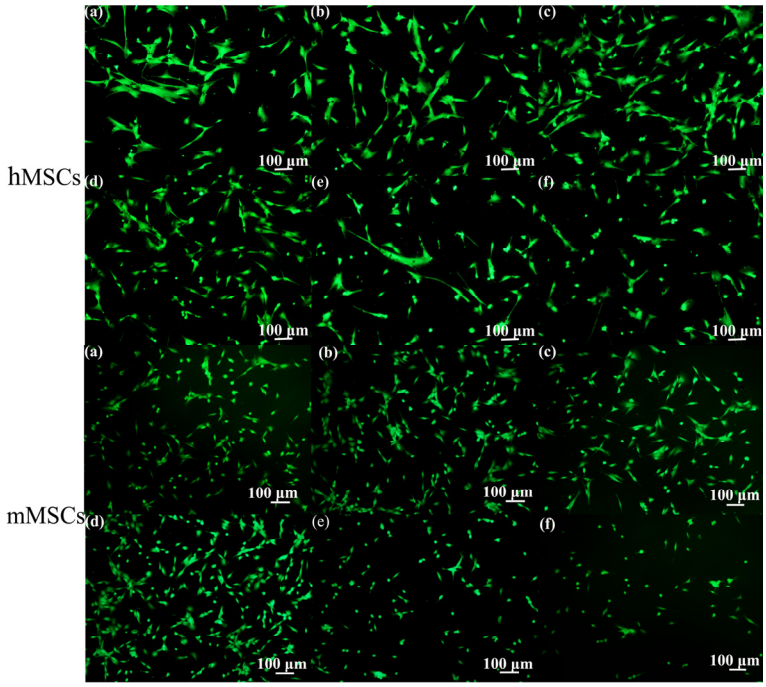

Figure S1. Fluorescence images of MSCs adhering on different -OH/-CH_3 mixed SAMs after 12 h of culture. Cells were fixed and stained with FITC (green). (a) -OH; (b) -OH/-CH_3 (9/1 v/v); (c) -OH/-CH_3 (7/3 v/v); (d) -OH/-CH_3 (5/5 v/v); (e) -OH/-CH_3 (3/7 v/v); (f) -CH_3.

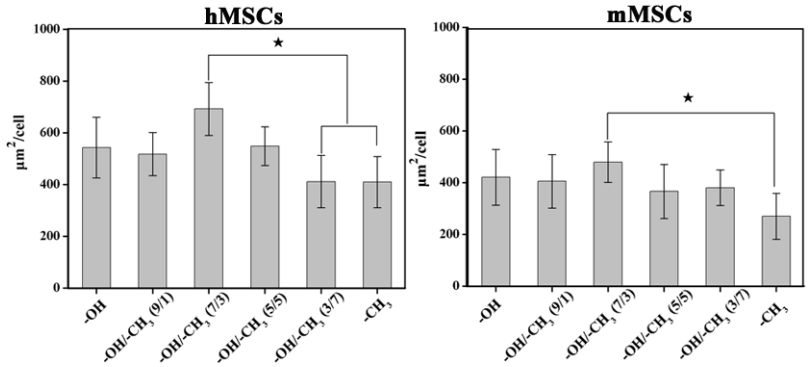

Figure S2. The quantified spreading cell area calculated from fluorescence images on different -OH/-CH_3 mixed SAMs after 12 h of culture. The ★ indicated significant difference (p<0.05).

Osteogenic differentiation on day 14

The osteogenic gene expression of MSCs after 14 days of culture was shown in Figure S3. In general, the difference in the expression of Runx-2, ALP, Osteocalcin and Collagen I among different SAMs was similar between on day 14 and on day 7.

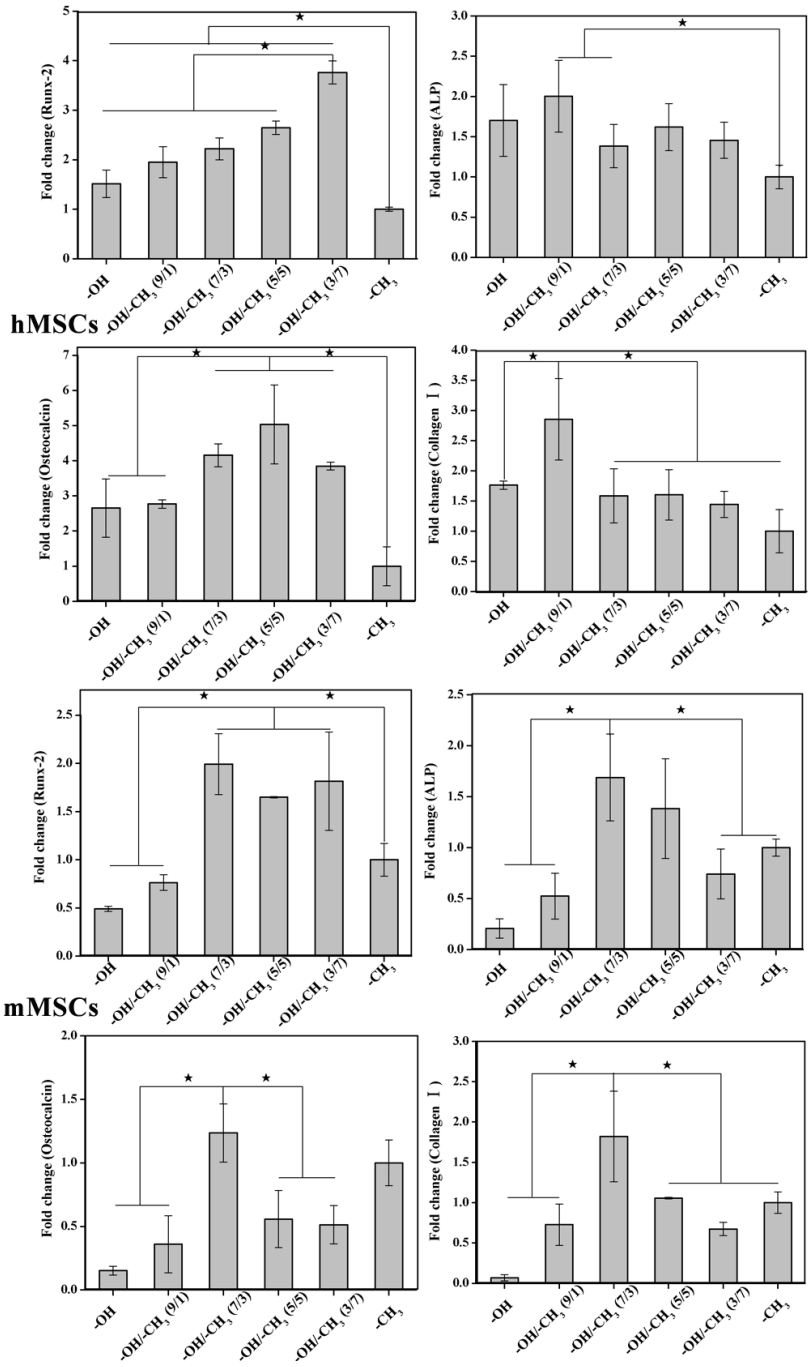

Figure S3. Relative gene expressions of Runx-2, ALP, Osteocalcin and Collagen I in MSCs using RT-PCR on different -OH/-CH_3 mixed SAMs against -CH_3 SAM after 14 days of culture. The ★ indicated significant difference (p<0.05).

The gene expression of αvβ1 integrin

The gene expression of αvβ1 integrin by MSCs was evaluated by RT-PCR after 12 h of culture. The result showed an increase in the expression level of αvβ1 integrin in hMSCs on -OH/-CH_3 (9/1 v/v), (7/3 v/v) and (5/5 v/v) terminated SAMs compared with -OH, -OH/-CH_3 (3/7 v/v) and -CH_3 terminated SAMs. The expression level of αvβ1 integrin in mMSCs growing on the -OH/-CH_3 (9/1 v/v) and (7/3 v/v) modified surfaces were significantly higher than that on the -OH/-CH_3 (3/7 v/v) and -CH_3 modified surfaces. In addition, the integrin β1 on the -OH/-CH_3 (9/1 v/v) terminated SAMs was higher than other SAMs in mMSCs. Cells on moderate wettability presented higher expression of αvβ1 integrin, which was consistent with the results of cell phenotype behavior.

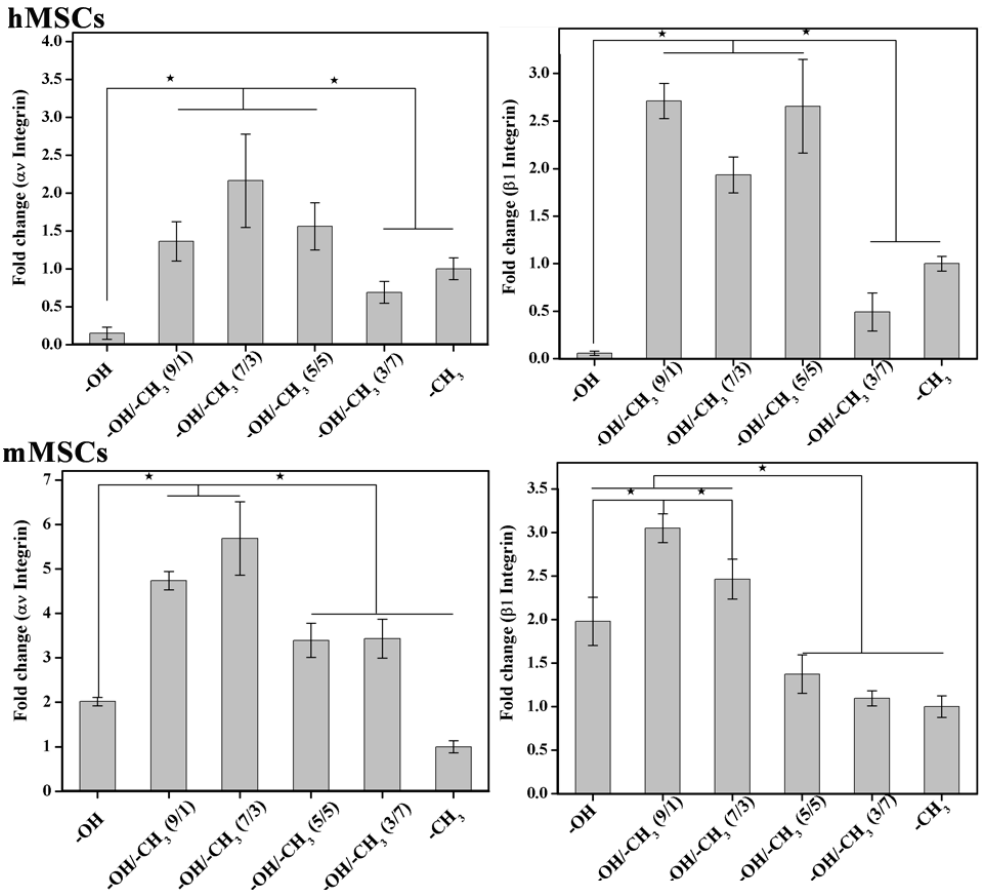

Figure S4. Gene expression of β_1 and α_v integrin using RT-PCR of MSCs on different -OH/-CH_3 mixed SAMs against -CH_3 after 12 h of culture. The ⋆ indicated significant difference (p<0.05).