**Supplementary Figure 1.** Relative OP gene expression of hADSCs encapsulated with different concentration of GO at 2 weeks (n=3 per group, * p < 0.05 versus GO 0.5X, # p < 0.05 versus GO 2X).

**Supplementary Figure 2.** (A) UV-Vis spectrometer according to GO concentration and (B) its image.

**Supplementary Figure 3.** hADSC culture on 2D PEGDA and PEGDA-GO. (A) Cell proliferation rate (B) ARS staining and (C) its quantitative analysis (Scale bar = 50 μm).
Supplementary figure 2
Supplementary figure 3