Supporting Information

PEGylated graphene oxide-mediated quercetin modified collagen hybrid scaffold for enhancement of MSCs differentiation potential and diabetic wound healing

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Table S1 Primers for generating PCR fragments

Name of primer	Forward primer (5’-3’)	Reverse primer (5’-3’)
β-actin	CGTTGACATCCGTAAAGACC	TAGGAGCCAGAGCAGTAATC
LPL	AGTTTGACCGCCTTCCGCGG	TCCTGTCACCGTCCATCCATGGA
PPARγ	ACTGCCGGATCCACAAAA	TCTCCTTCTCGGCCTGTG
ALP	AACCCAGACACAAGCATTCC	CCAGCAAGAAGAAGCCTTTTG
Runx-2	TGCCACCTCTGACTTCTGCC	CGCTCCGGCCCACAATCTC
Col I	TGACTGGAAGAGCGGAGAGT	GACGGCTGAGTAGGGAACAC
Col III	AGGTTCTCCTGGTGCTGCT	GGATGCCCACTTGTTCCAT
a-SMA	AATGGCTCTGGGCTCTGTAA	CTCTTGCTCTGGGCTTCATC

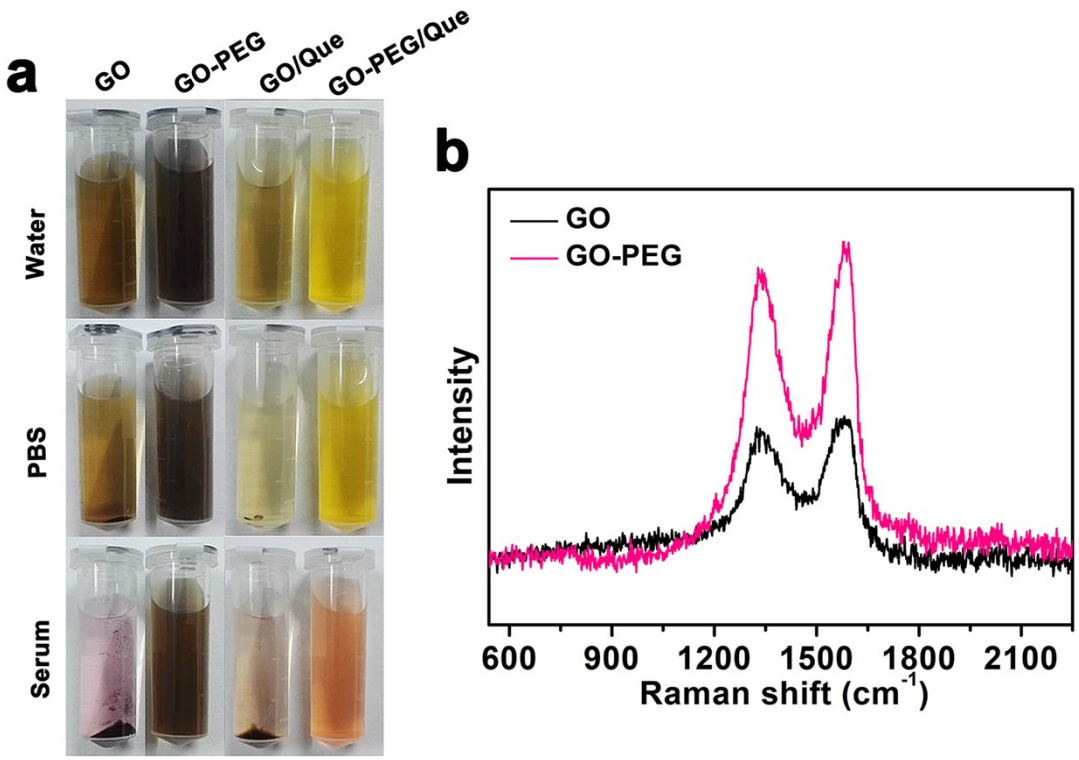

Fig. S1 (a) Photos of the stability of GO, GO-PEG, GO/Que and GO-PEG/Que in Water, PBS and Serum, recorded after centrifugation at 10,000 g for 5 min. (b) Raman spectra of GO and GO-PEG, recorded at 514.5 nm.

Table S2 Wavenumbers (cm^{-1}) and assignments of the main infrared bands of GO and GO-derivatives[a]

Compounds	ν-OH	ν-CH2-	νC=O	ν-NH-CO-	νC2=C3	νC=C(A)	δC3-OH	νC-O	νC-O-C	νbenzene
GO	3342s	—	1722m	—	1621m	—	1374b.w	1250	1043m	—
GO-COOH	3136b.s	—	1706m	—	1581s	—	1363b.s	—	1043s	—
GO-PEG	3200b.s	2850w	—	1698w	1616b.s	—	1347m	—	1060s	—
Que	3239b.s	—	1660m	—	1604s	1519s	1378m	1315m	1091w	817m
GO/Que	3255b.s	—	1635vw	—	1606m	1520w	1380w	1320vw	1058s	812w
GO-PEG/Que	3254b.s	2849w	1637vw	1660m	1606s	1518s	1378m	1316m	1090w	816m

a Abbreviations: b., broad; m., medium; s., strong; w., weak; vw., very weak

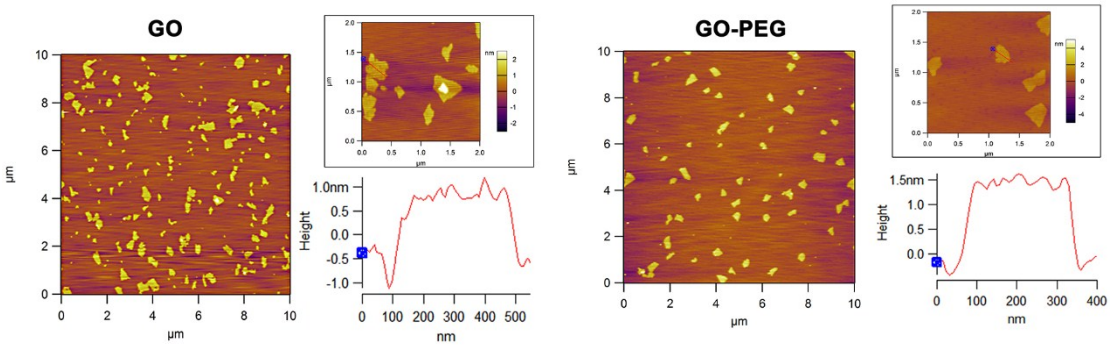

Fig. S2 AFM images and representative height profiles of GO and GO-PEG.

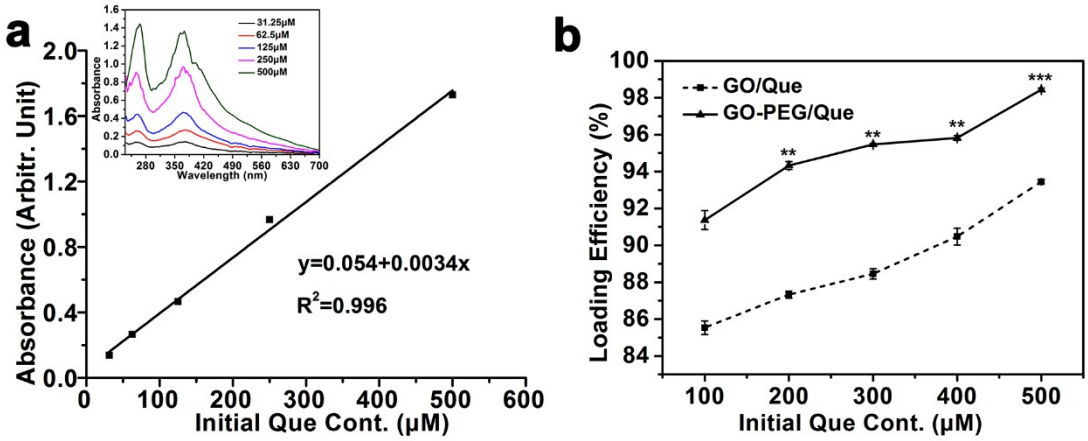

Fig. S3 Loading efficiency of GO-PEG/Que. (a) UV-Vis absorbance and standard curve of different initial Que concentrations at a wavelength of 370 nm. (b) Loading efficiency of different initial amount of Que loaded onto 0.1 mg/mL GO and GO-PEG (*$p \leq 0.05$, **$p \leq 0.01$, $n = 3$).

Table S3. Raman-selected bands (cm^{-1}) and assignments in the range of 700-1700 cm^{-1} region of ADM scaffold [a]

Tentative assignments	Raman shift/cm^{-1}	
γ-(C-C)-Pro	857	923
γ-(C-C)-HyPro	880	
γ-(C-C)-backbone	939	
Phe	1004	
	1207	
Pro	1034	
γ-(C-C)	1167	
HyPro	1178	
Amide Ⅲ	1248	
	1280	
δ-(CH)	1322	
	1444	
CH_2-Pro	1346	
δ-(COO-)	1428	
C-H	1458	
Amide Ⅰ	1640	
	1673	

[a] Abbreviations: γ, stretching vibration; δ, deformation vibration; Phe, phenylalanine; Pro, proline; Hypro, hydroxyproline.

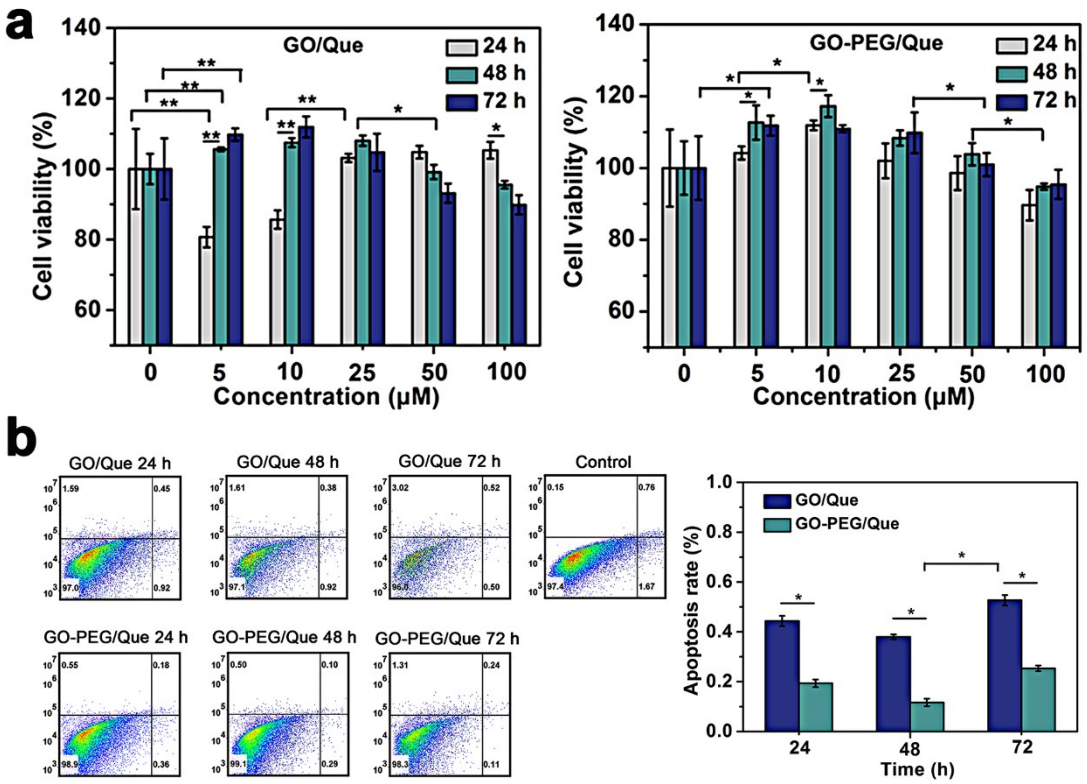

Fig. S4 *In vitro* cell viability and toxicity. (a) MTT assay to assess the viability of MSCs incubated with various GO/Que and GO-PEG/Que concentrations (0-100 μM) for 24 h, 48 h and 72 h, respectively (*p ≤ 0.05, **p ≤ 0.01, n = 6). (b) MSCs after 24 h, 48 h and 72 h of incubation with GO/Que and GO-PEG/Que were subjected to flow cytometry analysis (*p ≤ 0.05, n = 3).

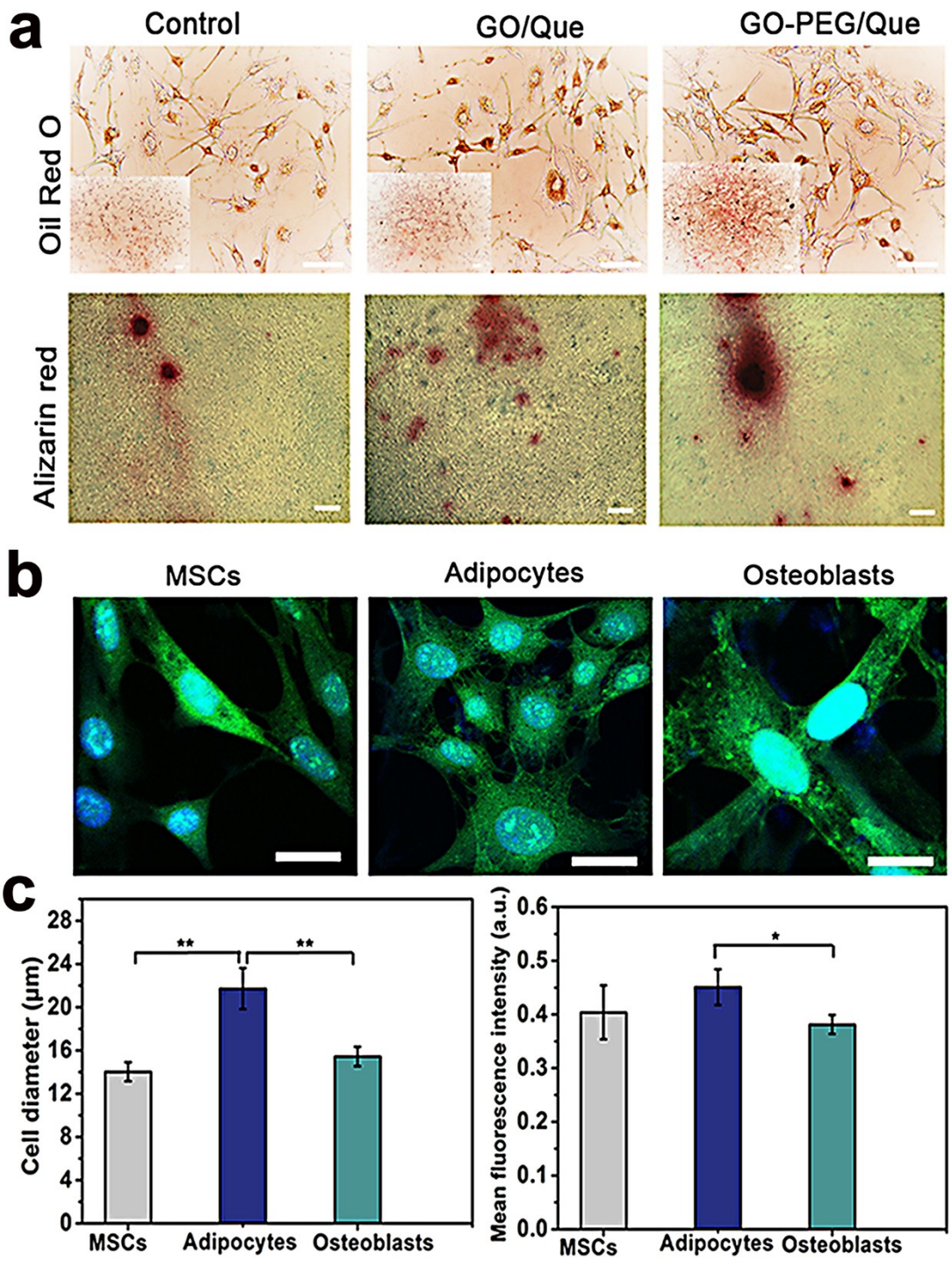

Fig. S5 Adipogenic and osteogenic differentiation of MSCs *in vitro*. (a) Oil red O and Alizarin red staining of MSCs after incubation with induction medium (control), GO/Que and GO-PEG/Que (n = 6). Scale bar: 100 μm. (b) Morphology of the MSCs, adipocytes and osteoblasts. Scale bar: 10 μm. Cell diameter (c) and mean fluorescence intensity (d) of MSCs, adipocytes and osteoblasts (*$p \leq 0.05$, **$p \leq 0.01$, n = 6).