ACCSCIENCE PUBLISHING

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RESEARCH ARTICLE

Low-concentration GOQD-functionalized Ti6Al4V scaffolds enhance osteogenesis and angiogenesis for vascularized bone regeneration

Supplementary file

Table S1. Primer sequences for RT-PCR analysis of gene expression in BMSCs

Gene	Primer	Primer sequence (5'–3')
Bmp2	Forward	CTCAGAACACAAGTCAGT
	Reverse	ACCTGCTAATCCTCACAT
Ocn	Forward	CTCACTCTGCTGGCCCTGAC
	Reverse	CACCTTACTGCCCTCCTGCTTG
Runx2	Forward	TACTTCGTCAGCATCCTA
	Reverse	CGTCAACACCATCATTCT
Ctnnb1	Forward	GGACAAGCCACAGGAT TAC
	Reverse	CAGTCTCATTCCAAGCCATT
Gapdh	Forward	AACCTGCCAAGTATGATGA
	Reverse	GGAGTTGCTGTTGAAGTC

Abbreviations: BMSCs, bone marrow mesenchymal stem cell; RT-PCR, real time-polymerase chain reaction.

Table S2. Primer sequences for RT-PCR analysis of gene expression in HUVECs

Gene	Primer	Primer sequence (5'–3')
VEGF	Forward	GAGGAGCAGTTACGGTCTGTG
	Reverse	TCCTTTCCTTAGCTGACACTTGT
HIF1A	Forward	TTCCCGACTAGGCCCATTC
	Reverse	CAGGTATTCAAGGTCCCATTTCA
GAPDH	Forward	AACCTGCCAAGTATGATGA
	Reverse	GGAGTTGCTGTTGAAGTC

Abbreviations: HUVECs, human umbilical vein endothelial cells; RT-PCR, real time-polymerase chain reaction.

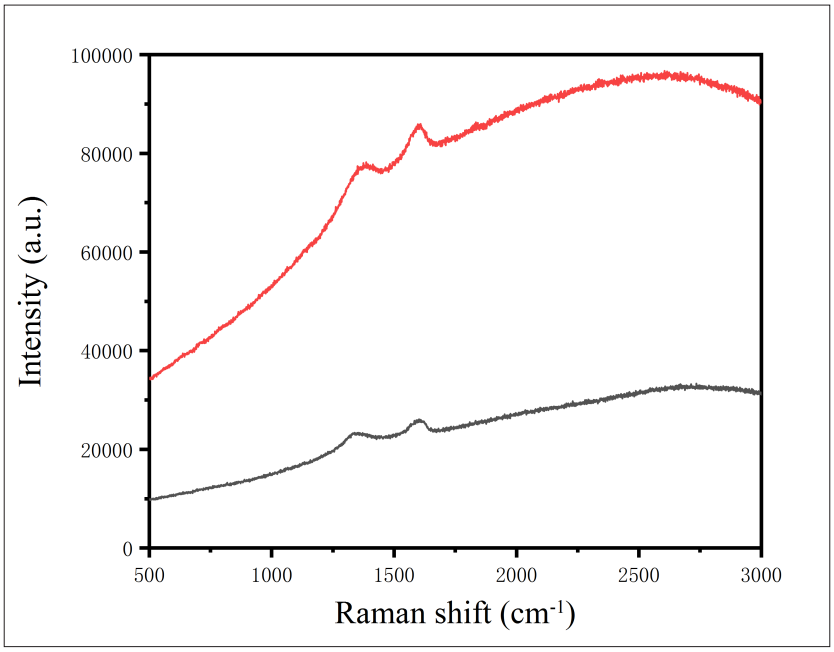

Figure S1. Raman spectra of GQ0.1@TC4 scaffolds before and after immersion in culture medium. The red line represents the Raman spectrum of the GQ0.1@TC4 scaffold before immersion, while the black line corresponds to the scaffold after immersion in complete culture medium for 2 weeks.

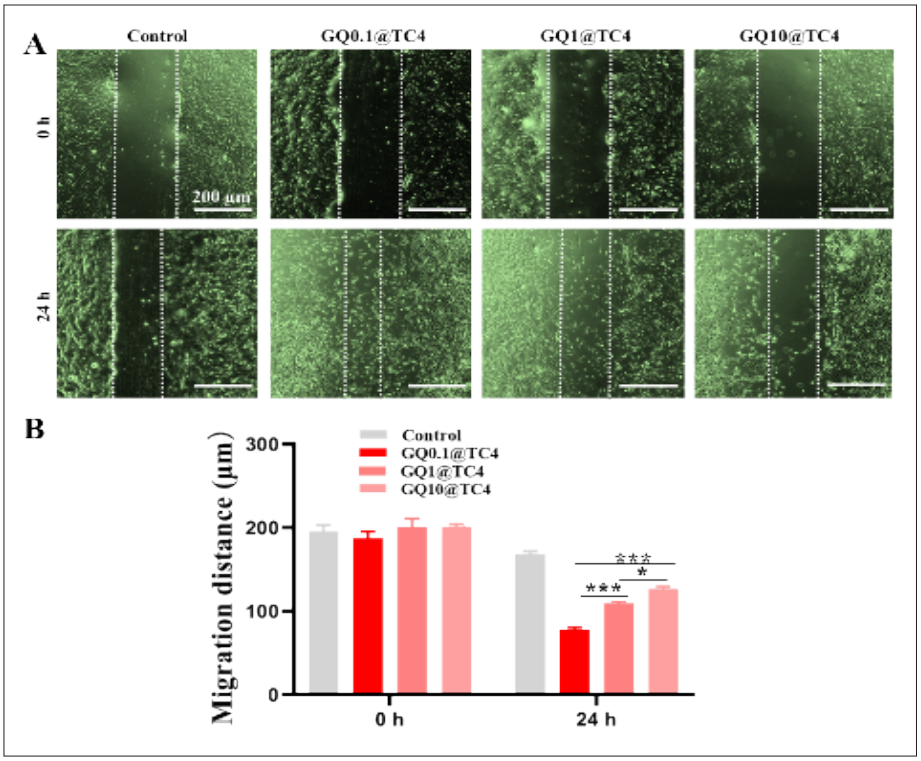

Figure S2. Effects of GOQD-modified biomimetic scaffold extracts on HMSC proliferation and angiogenic capacity. (A) Fluorescence images of scratch assays displaying HMSCs migration at 0 and 24 h after treatment with the four scaffold extracts. (B) Quantitative bar graph of HUVEC migration distances. $n = 3$; $^{*}p < 0.05$ and $^{***}p < 0.001$, compared to the control. Scale bars: 200 μm. Abbreviations: HMSC, human mesenchymal stem cells; GOQD, graphite oxide quantum dots; HUVEC, human umbilical vein endothelial cells.