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Supplementary Information

A Core-shell structured VEGF-SiO₂@ZnO nanorod array for enhancing

osteogenesis of Zn-based implants

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Key words: Zn-1Ca alloy; core-shell structure; anti-corrosion; angiogenesis; osteogenesis



Figure S1. Characterization of ZO. a) Surface and cross-sectional morphologies of ZO, the insets showing the corresponding element compositions. b) TEM images of a nanorod scratched from ZO, including bright-field image, SAED image and corresponding HRTEM image.



Figure S2. Surface morphologies of different samples after immersion in Hank's solution for 1 days.



Figure S3. Surface morphologies of different samples after immersion in Hank's solution for 3 days.



Figure S4. Surface morphologies of different samples after immersion in Hank's solution for 14 days.





Figure S6. Surface roughness of different samples.



Figure S7. SEM images of BMSCs cultured on different samples for 1 day.



Figure S8. Gene expressions of BMSCs after 7 days of incubation: a) ALP, b) Runx2, c) OPN and d) OCN.



Figure S9. X-ray image of the implantation region.



Figure S10. Scratch morphologies of different samples together with the amplified view of marked initial failure areas; the EDX spectra were detected on the 1-marked surface and in the 2-marked delaminating region, respectively.

Table S1		
Gene	Forward primer sequence $(5'-3')$	Reverse primer sequence $(5'-3')$
KDR	GTGATCGGAAATGACACTGGAG	CATGTTGGTCACTAACAGAAGCA
HIF-1a	CCATGTGACCATGAGGAAAT	CGGCTAGTTAGGGTACACTT
VEGF	TGCGGATCAAACCTCACCA	CAGGGATTTTTCTTGTCTTGCT
MMP9	GGCACCACCACAACATCACC	GGGCAAAGGCGTCGTCAATC
ZIP1	GCGTGCCTGTGTACTGGTCTTC	CGCTCGTAGGTGGCTCTGTAGA
ZnT1	AGGCAGAGAAGGCTCCAACAGT	TGTGCGACCAGACGAGGACTT
Runx2	TGGTTACTGTCATGGCGGGTA	TCTCAGATCGTTGAACCTTGCTA
ALP	ACTGGTACTCAGACAACGAGAT	ACGTCAATGTCCCTGATGTTATG
OCN	GAACAGACAAGTCCCACACAGC	TCAGCAGAGTGAGCAGAAAGAT
OPN	TTTACAACAAATACCCAGATGC	TTTACAACAAATACCCAGATGC
GAPDH	CCACCCTGTTGCTGTAGCC	CCCACTCCTCCACCTTTGA