

Supporting Information

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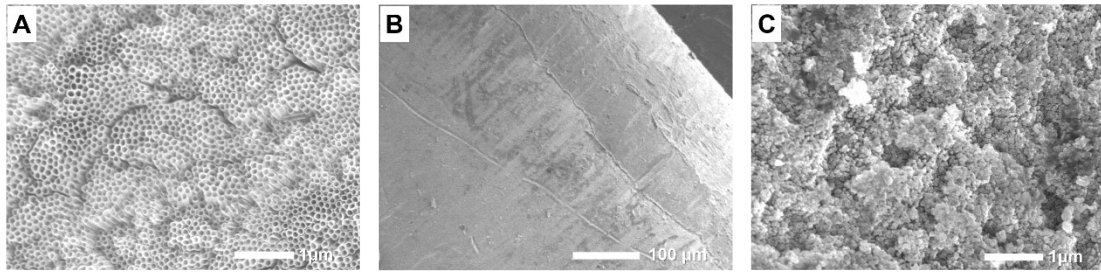


Figure S1. SEM images of titanium rods used as implants: (A) TiO₂ rod, (B-C) Zn-Sr/TiO₂ rod.

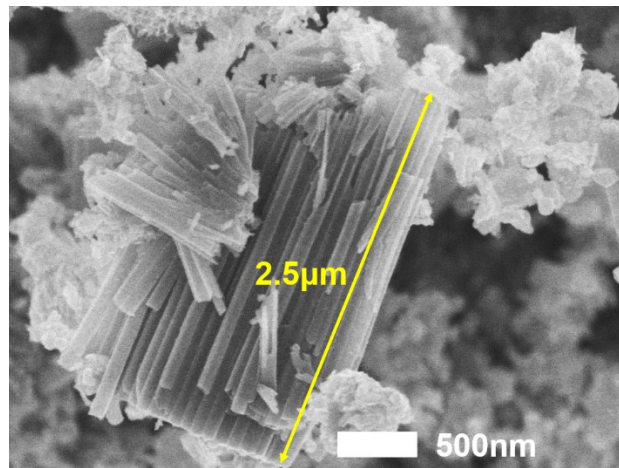


Figure S2. SEM images of cross sectional TiO₂ nanotubes on a flat Ti support.

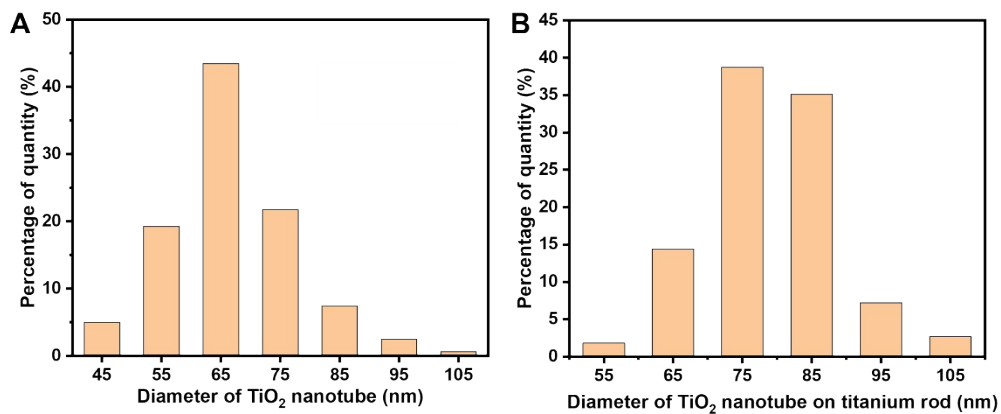


Figure S3. Analysis on the top diameter of TiO₂ nanotube (A) on titanium foil (Average size: 68.7±10.8 nm) and (B) on titanium rod (Average size: 74.2±9.7 nm).

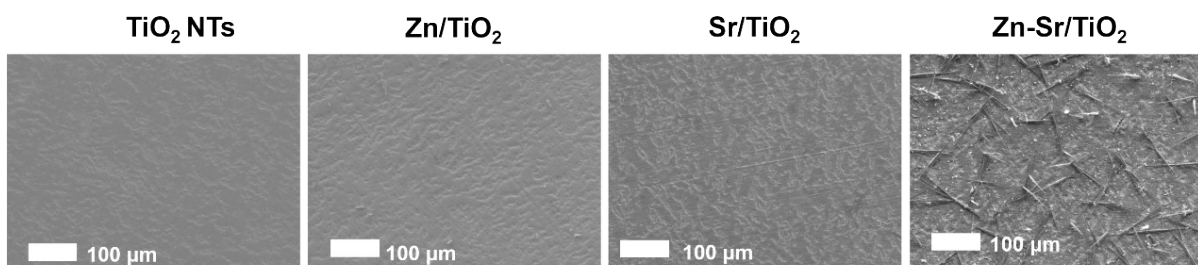


Figure S4. SEM images of different investigated surfaces.

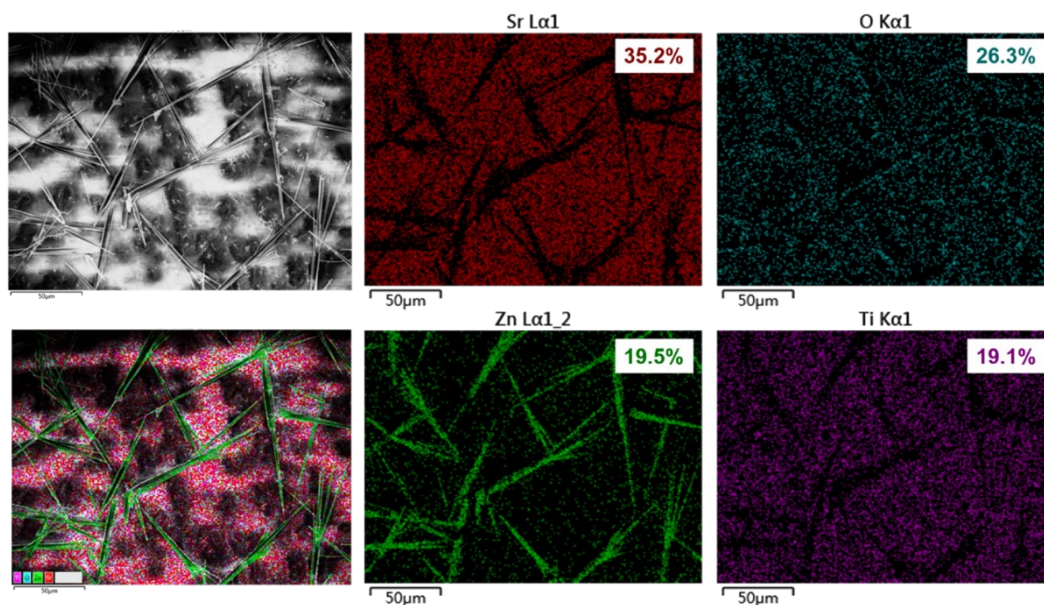


Figure S5. EDS analysis of surface regions contains needles on Zn-Sr/TiO₂ surface.

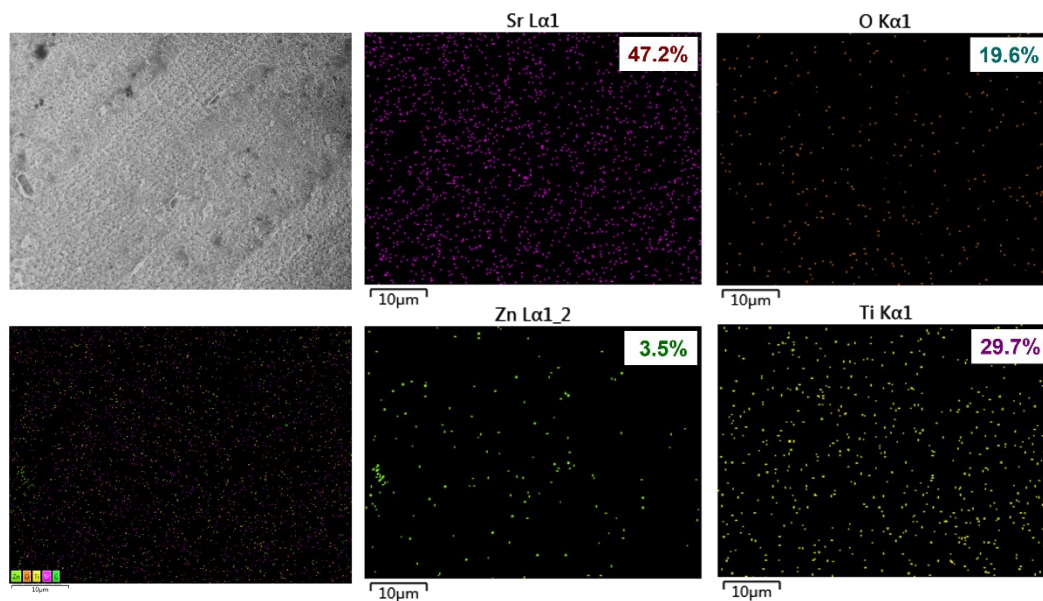


Figure S6. EDS analysis of Zn-Sr/TiO₂ rod.

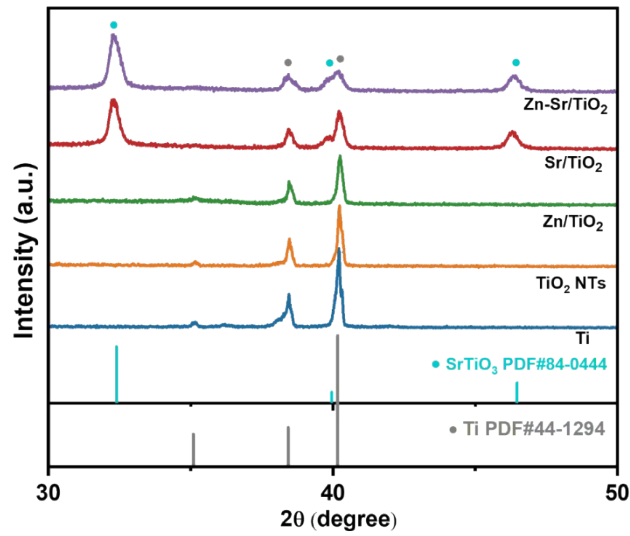


Figure S7. XRD patterns of TiO₂ NTs, Zn/TiO₂, Sr/TiO₂ and Zn-Sr/TiO₂.

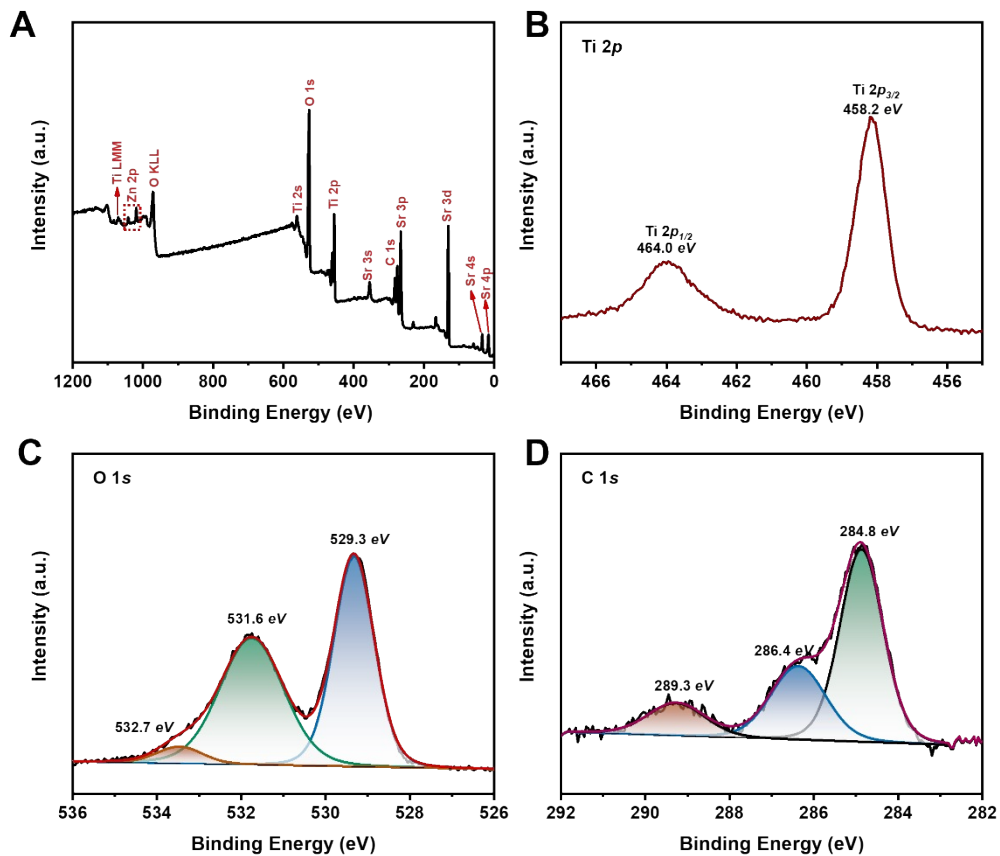


Figure S8. (A) XPS survey spectrum of Zn-Sr/TiO₂ and corresponding high resolution XPS spectra: (B) Ti 2*p*, (c) O 1*s*, (d) C 1*s*.

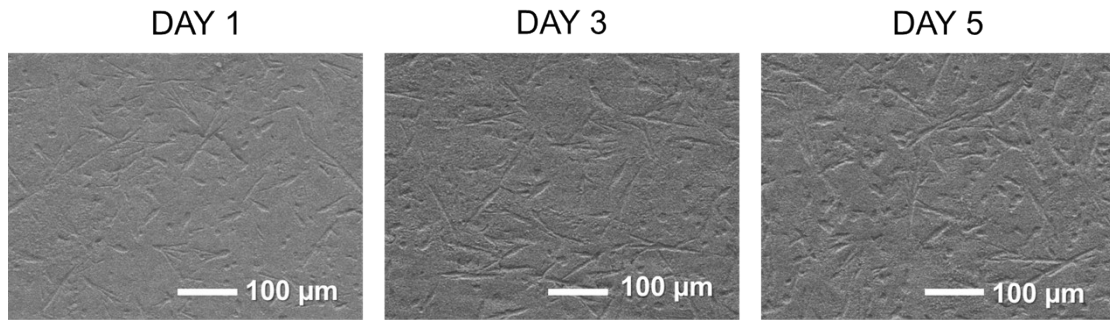


Figure S9. SEM images of Zn-Sr/TiO₂ during ion release process in SBF solution.

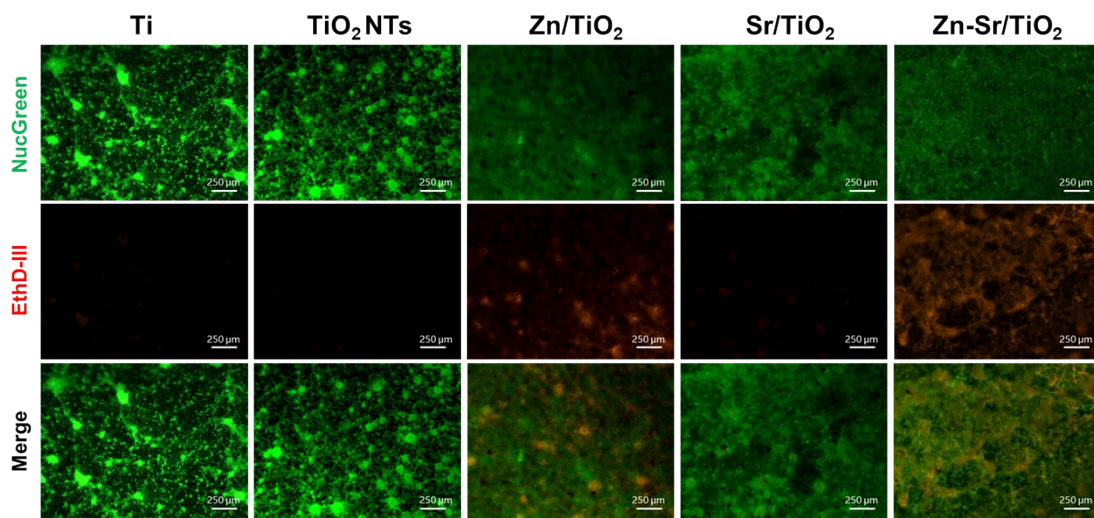


Figure S10. Live/Dead bacterial staining images of *S. aureus* cocultured from different group.

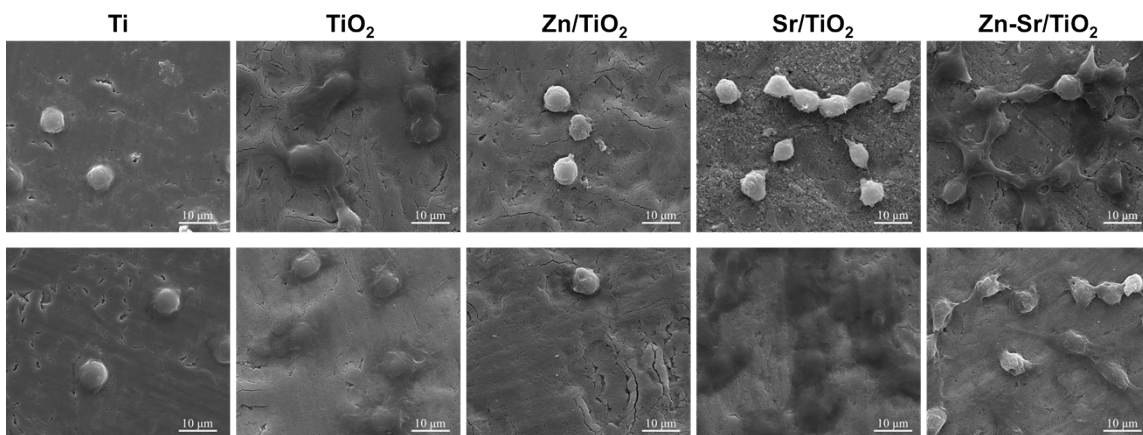


Figure S11. SEM images of RAW 264.7 cells culturing on different specimens at low magnification.

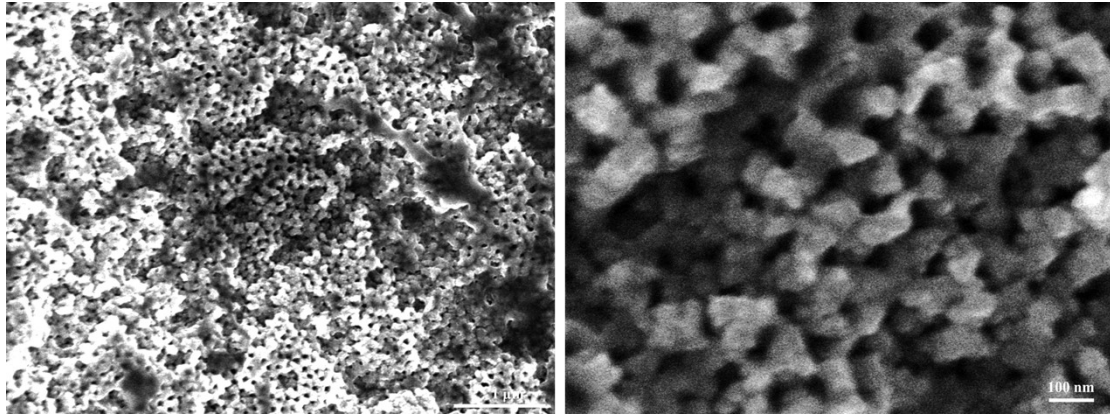


Figure S12. SEM images of Zn-Sr/TiO₂ rod taken from femur 3 days post-surgery.

Table S1 Primer sequences of the genes involved in this study.

Primer	Forward primer 5'-3'	Reverse primer 5'-3'
GADPH	AAGGCCGGGGCCCACTTGAA	GGACTGTGGTCATGAGCCCTTCCA
iNOS	GTTCTCAGCCCAACAATACAAGA	GTGGACGGGTCGATGTCAC
TNF- α	CAGGCGGTGCCTATGTCTC	CGATCACCCCGAAGTTCAGTAG
TGF- β	GAGCCCGAAGCGGACTACTA	TGGTTTTCTCATAGATGGCGTTG