

Supplementary Information

Cicada & Catkin Inspired Dual Biomimetic Antibacterial Structure for the Surface Modification of Implant Material

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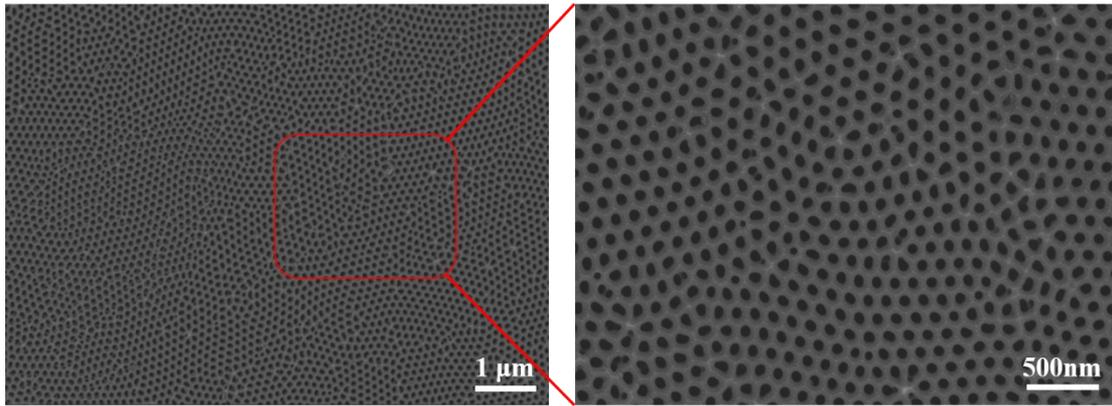


Figure S1. SEM images of AAO template with different magnification.

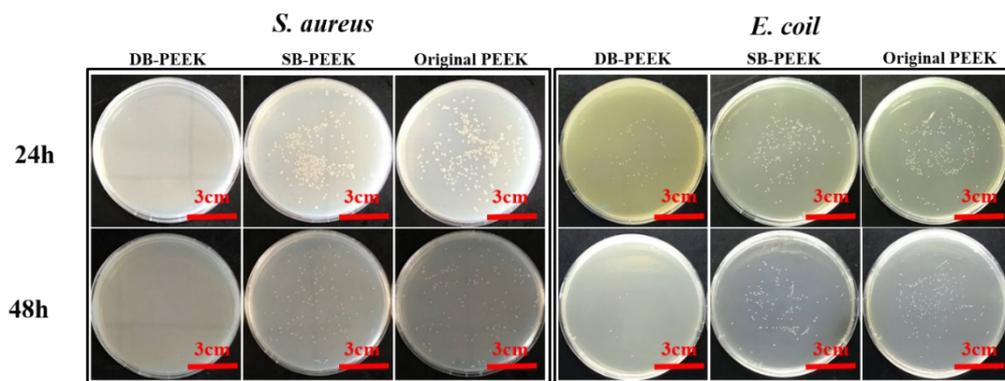


Figure S2. The optical diagram of plate counting results of bactericidal activity of three samples (original PEEK, SB-PEEK and DB-PEEK) in Luria–Bertani broth at 24 hours and 48 hours incubation with *S. aureus* and *E. coli*, respectively.

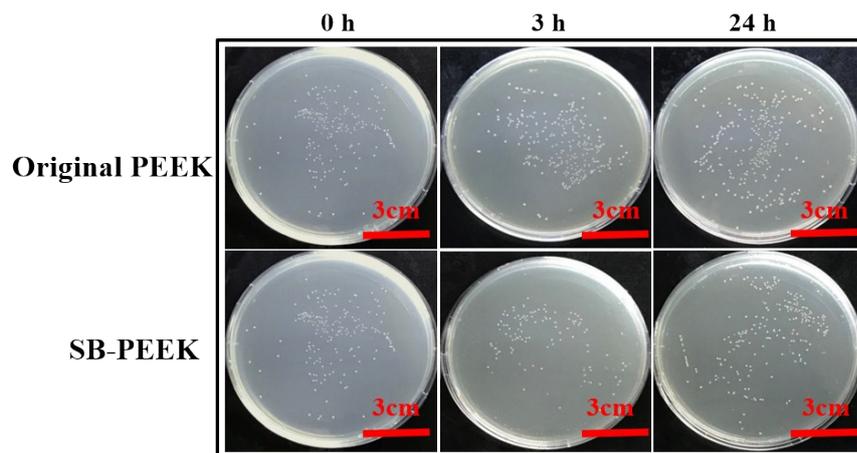


Figure S3. The optical diagram of plate counting results of bactericidal activity of SB-PEEK at 0 hour, 3 hours and 24 hours incubation in PBS , respectively.

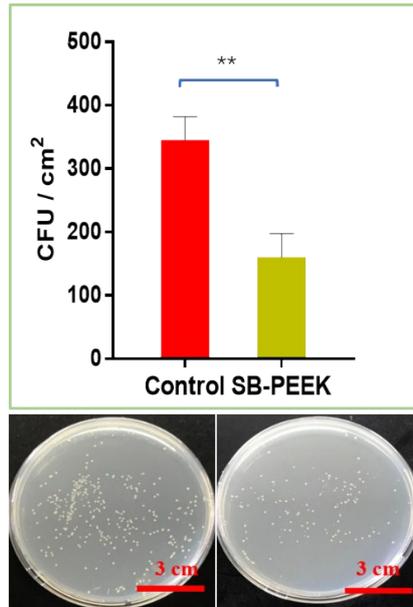


Figure S4. The evaluation of the resistance adhesion capability of SB-PEEK (by using *S. aureus*). The bottom was the corresponding plate counting photos of bacteria left on the surface of the material. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

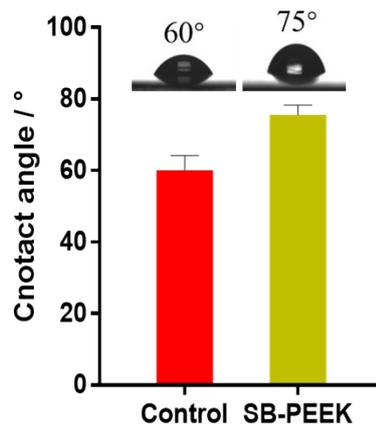


Figure S5. Contact angle results of the original PEEK and SB-PEEK samples.

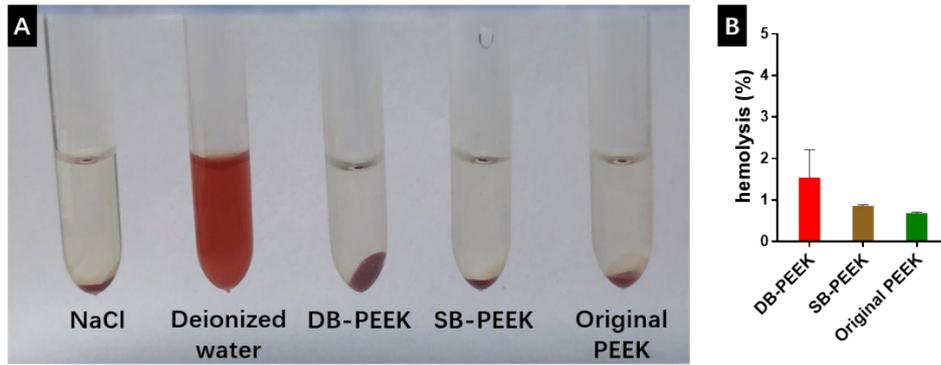


Figure S6. Hemolysis assay. (A) Optical photos of different groups of materials during the test; (B) Hemolysis rate of the original PEEK group, the SB-PEEK group and DB-PEEK group, respectively.

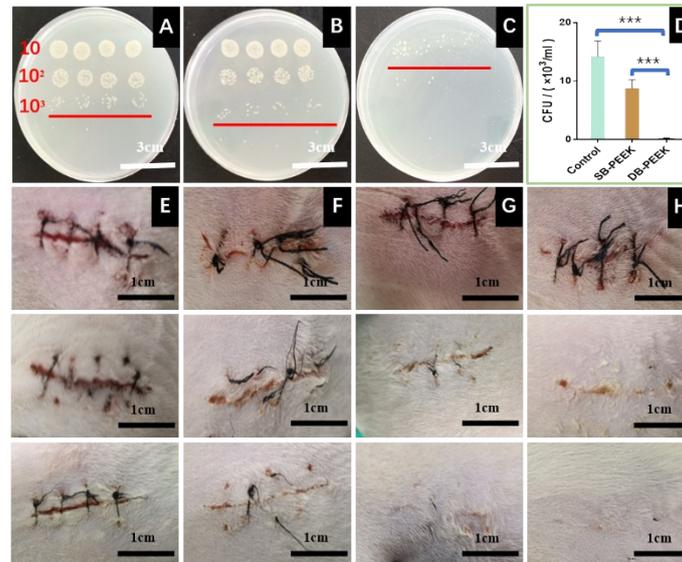


Figure S7. *In Vivo* implant Studies with *E. coli*. (A-C) Plate counting photos of the viable bacteria on original PEEK group, SB-PEEK group and DB-PEEK group (10^2 , 10^3 and 10^4 mean degrees of dilution), respectively; (D) Counting results of viable cells on the surface of different implants, 8 days after surgery; (E-G) Optical photograph of wound healing at the 1, 4 and 8 days (from top to bottom) of the original PEEK group, the SB-PEEK group, DB-PEEK group and the blank control group, respectively.