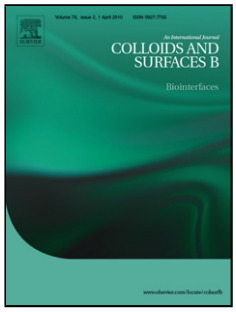

Title: A Hierarchical Polymer Brush Coating with Dual-function Antibacterial Capability

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<AT>A Hierarchical Polymer Brush Coating with Dual-function Antibacterial Capability

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<ABS-Head><ABS-HEAD>Graphical abstract
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<ABS-HEAD>Highlights► Hierarchical antibacterial surface was constructed via living SI-PIMP. ► Antifouling and bactericidal functions were integrated in a hierarchical surface. ► The pQAC layer was facilely adjusted to optimize the final performance. ► Optimized hierarchical surface showed long-lasting antibacterial performance.
<ABS-HEAD>Abstract
<ABS-P>Bacterial infections are problematic in many healthcare-associated devices. Antibacterial surfaces integrating the strength of bacteria repellent and bactericidal functions exhibit an encouraging efficacy in tackling this problem. Herein, a hierarchical dual-function antibacterial polymer brush coating that integrates an antifouling bottom layer with a bactericidal top layer is facilely constructed via living photograft polymerization. Excellent resistance to bacterial attachment is correlated with the antifouling components, and good bactericidal activity is afforded by the bactericidal components, and therefore the hierarchical coating shows an excellent long-term antibacterial capability. In addition, due to the presence of the hydrophilic background layer, the hierarchical surface has the greatly improved biocompatibility, as shown by the suppression of platelet adhesion and activation, the inhibition of erythrocyte adhesion and damage, and low toxicity against mammalian cells. The hierarchical polymer brush system provides the basis for the development of long-term antibacterial and biocompatible surfaces.