Supplementary information for

Superhydrophobic Coating of Elastomer on different Substrates with a Liquid Template to Construct a Biocompatible and Antibacterial Surface

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Supplementary information

Contents

1. Stability of superhydrophobic surface

1.1 stability of superhydrophobic surface after 3 months

The approach and departure process of water droplet on the surface casted film confirms surface micro/nano structuring leads to extreme anti-wetting properties. And the coating of SEBS remains stable for 3 months, demonstrating the potential application for long-term implantation.

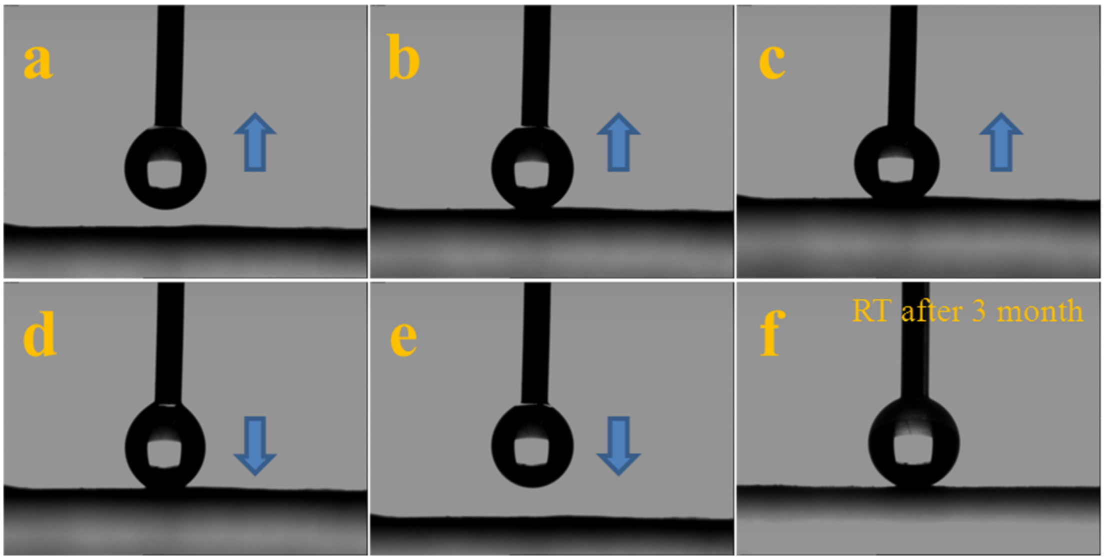

Fig. S1. Superhydrophobic properties of surface and stability of superhydrophobic surface at room temperature. a-e) The approach and departure process of an 2 μl water droplet from the $SEBS_3$ surface, the arrows represent the moving direction of substrate, f) The water contact angle on surface of $SEBS_3$ film remains higher than 150° after three months at room temperature.

1.2 Stability of superhydrophobic surface after tape test:

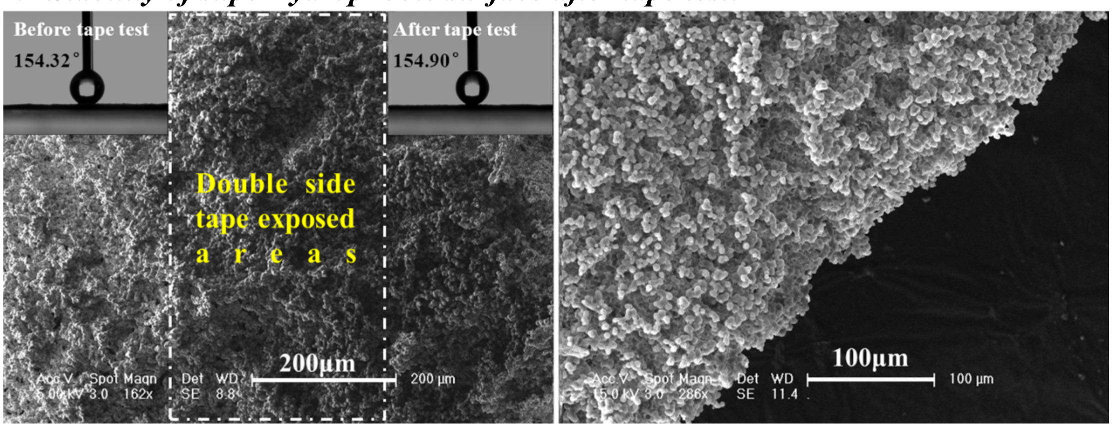

Fig. S2. SEM images of superhydrophobic surface that were exposed to double side tape (white boxes indicate the exposed areas) and the cross section of superhydrophobic SEBS films.

To quantify the mechanical stability of the superhydrophobic SEBS surface, adhesive tape test was performed. The tape test was performed according to Xu et .al (Adv. Mater. 2011, 23, 2962-2965), briefly, double side adhesive tape was pressed to the superhydrophobic SEBS surface then peeled off. Then the SEBS film was sputter coated by gold and characterized by SEM. SEM images showed that after peeling the tape off, the surface which was composed of SEBS microbeads changed slightly. The static water CA on SEBS surface is 154.32°, it remains 154.90° after the tape test, demonstrating that a stable superhydrophobic surface can be achieved with our method.

2. ***Whole blood clotting test***

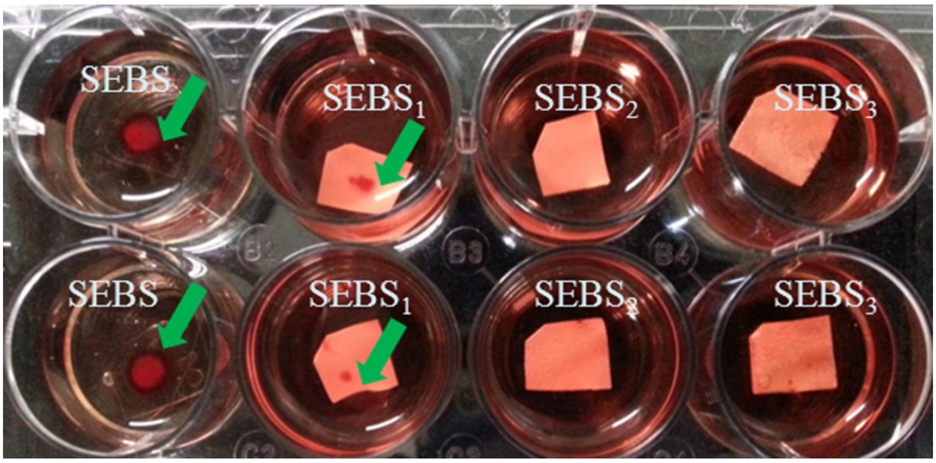

Fig. S3. Photopictures of blood clots on different SEBS film after incubation with whole blood for 30 min at 37°C. The arrows show the position of blood clot.

For whole blood clotting test, 30 μL fresh blood is dropped onto the samples, followed by incubation at 37 °C for 30 min. Then 3 mL deionized water is added to stop the reaction. The flat SEBS film shows no anticoagulation properties due to the adhesion of platelet and red blood cell and subsequent formation of blood clot on it. In contrast, no blood clots on the surface of $SEBS_2$ and $SEBS_3$ films can be detected, demonstrating that they have high blood compatibility in preventing the thrombus formation.

3. ***Platelet and bacterial adhesion***

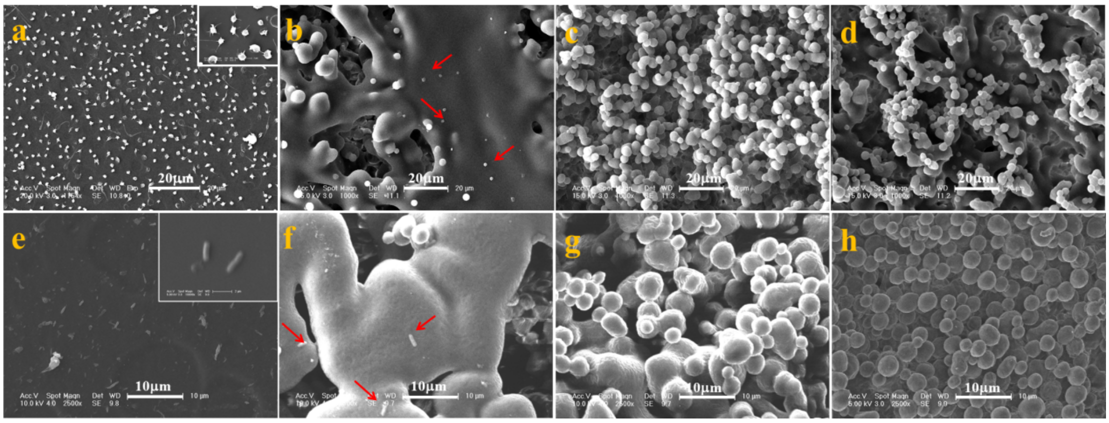

Fig. S4. (a-d) SEM images of platelet adhesion on virgin SEBS, $SEBS_1$, $SEBS_2$ and $SEBS_3$, respectively; (e-h) SEM images of bacterial adhesion on virgin SEBS, $SEBS_1$, $SEBS_2$ and $SEBS_3$, respectively.

The flat surface of virgin SEBS is covered with a large number of platelets and most of these platelets are highly activated, as evidenced by their spread-dendritic shape and presence of pseudopodia (Fig.S3a). The number of adhered platelets decreased sharply on the hydrophobic surface, and few round platelets without pseudopodium filaments are observed on hydrophobic surface of $SEBS_1$ (Fig. S3b). No adhered platelets are observed on superhydrophobic surface of $SEBS_2$ and $SEBS_3$, indicating that the superhydrophobic coatings can effectively resist the adhesion and activation of platelets. The result of bacterial adhesion on different SEBS film was shown in Fig S3e-h, many bacterial adhesions on flat virgin SEBS film. However, no adhered E. coli were observed on superhydrophobic surface of $SEBS_2$ and $SEBS_3$.

4. ***Thickness and uniformity of the resulting porous SEBS films***

The surface of porous SEBS film showed high uniformity, as demonstrated by SEM images in Fig. 2 and the data of water contact angle on varied points of coating surface (158 ± 5°). As shown in Figure S5, the change of thickness had slight effects on the surface topography, uniformity of porous SEBS film and corresponding superhydrophobic property. Considering the stable adhesion of SEBS coating on the substrates, the thickness ranging from 200 μm to 400 μm was optimal.

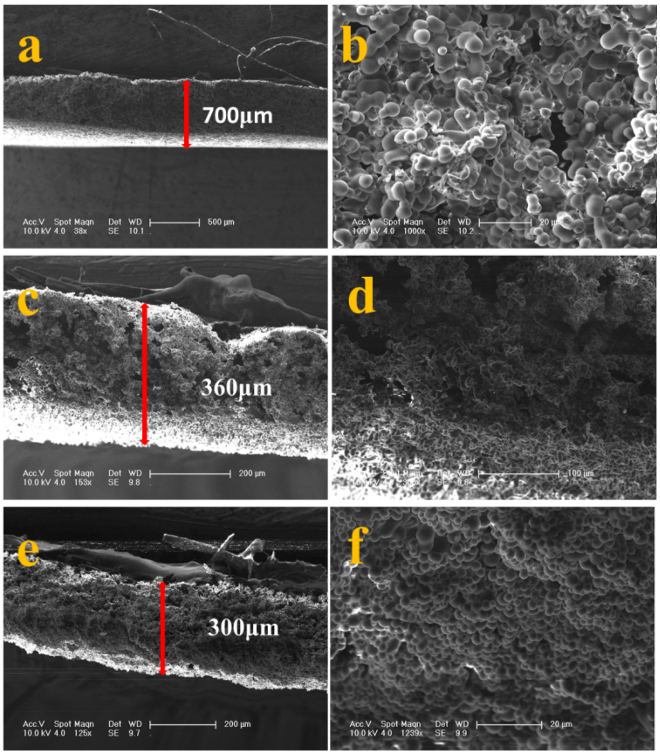

Fig. S5. (a, c, e) SEM images of SEBS films (cross section) with various thickness and (b, d, f) the surface morphology of corresponding samples.

5. Video S1 shows the behavior of water drop on the $SEBS_3$ surface
6. Video S2 shows the different rolling behaviors of water droplets on the surface of SEBS and $SEBS_3$, respectively.