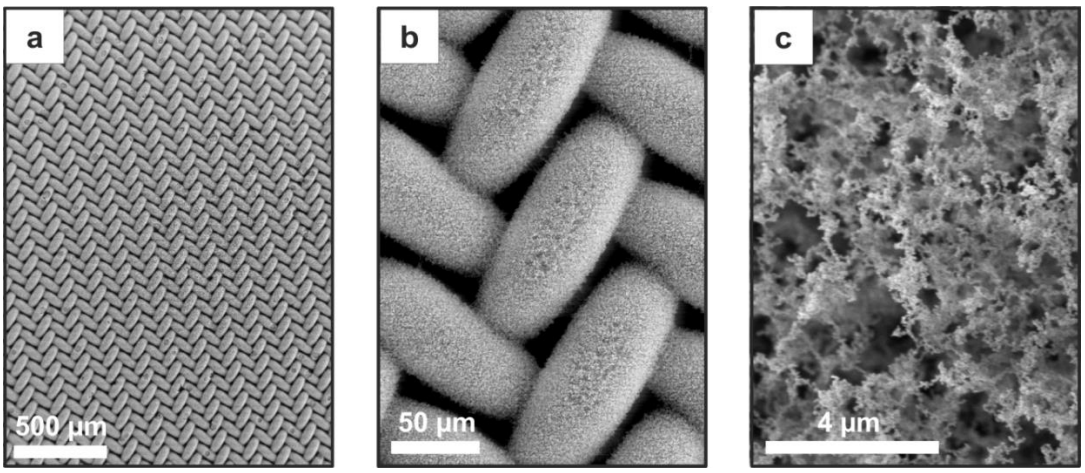
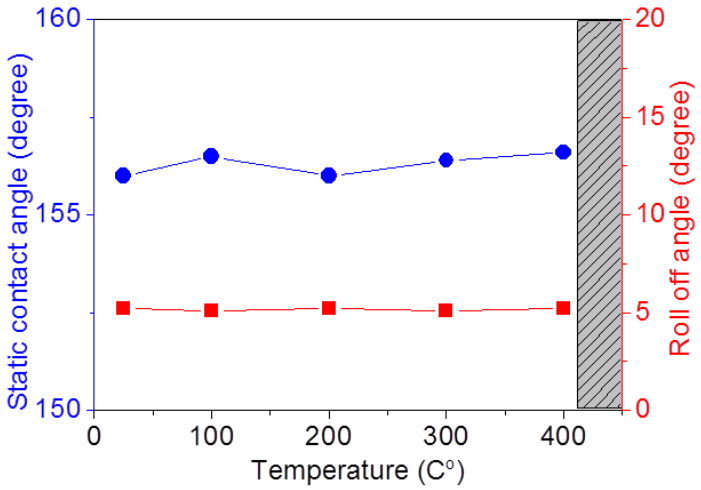
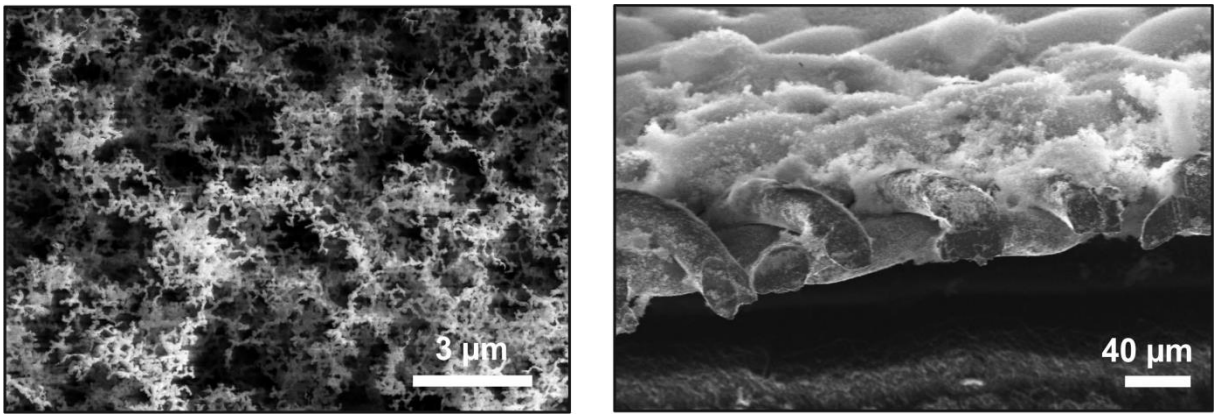


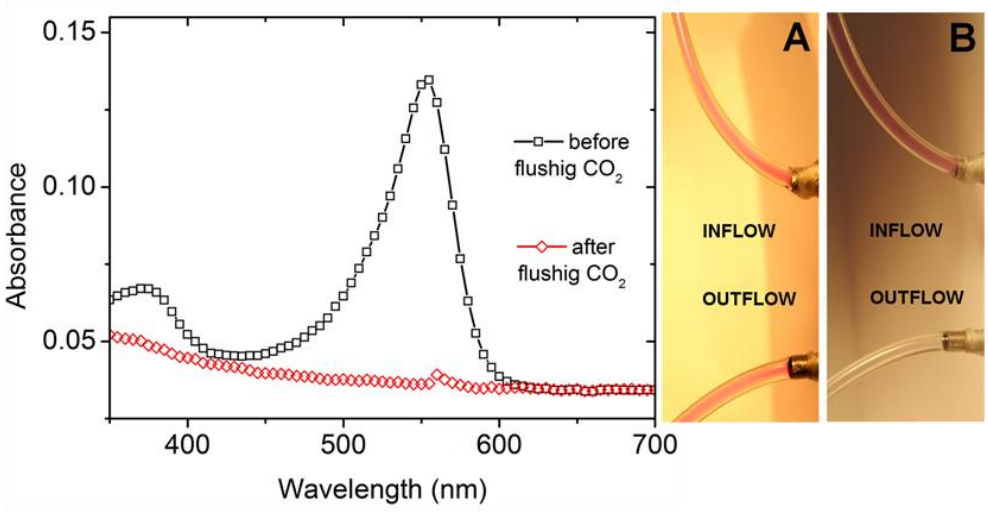
Supplementary Figure S1: **Scanning electron microscopy images of a superamphiphobic meshes at different resolution**. The mesh was coated with a roughly 15 µm thick, highly porous superamphiphobic layer.



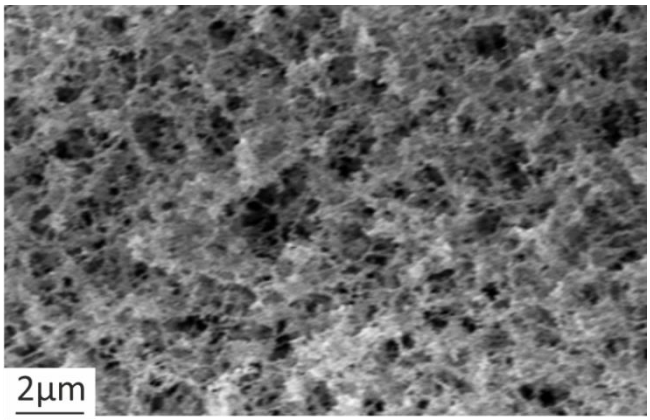
Supplementary Figure S2: **Thermal stability of the superamphiphobic coating**. Static contact angle and roll-off angle of a drop of water of roughly 6 µL volume. Reprint from Deng et. al., Ref. 18.



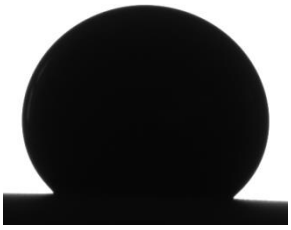
Supplementary Figure S3: Scanning electron microscope images of a fractured superamphiphobic mesh at different resolutions. Magnified views of the images shown in Fig. 1e and 1f. Left) The morphology of the topmost layer is independent of its thickness. Right) The coated metal meshes were cut with a scissor into small pieces and fixed at a SEM holder with double sided tape.



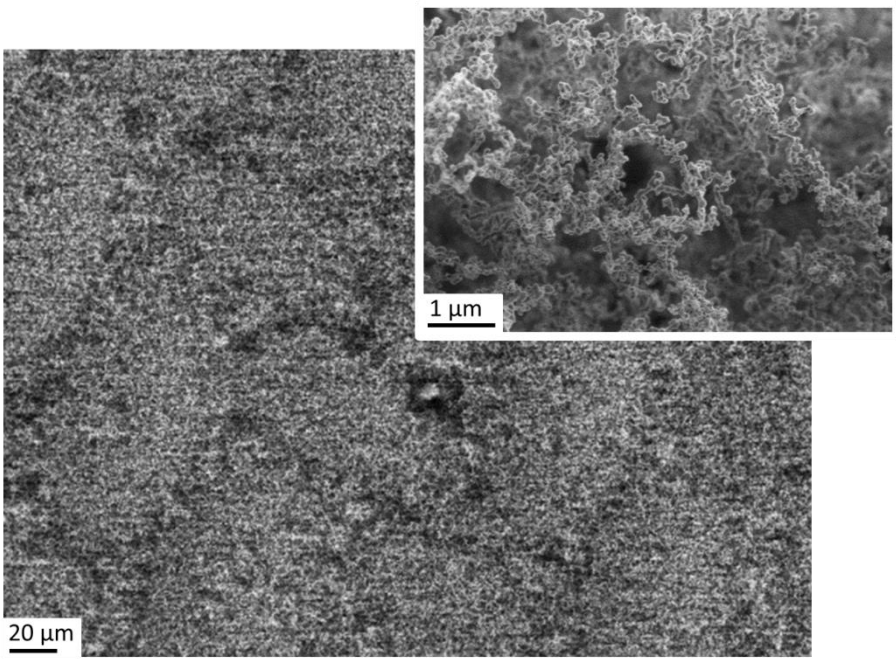
Supplementary Figure S4: Neutralization of NaOH aqueous solution. Left: UV-Vis spectrum, recorded as a function of wavelength. Spectra before and after flushing with CO_2. Right: A: In- and outflow of the air tight chamber before flushing with CO_2. B: In- and outflow of the air tight chamber after flushing with CO_2. Concentration NaOH: $4.6 \cdot 10^{-5}$ mol/L; pH (NaOH): 9.7; flush volume CO_2: 3.5 L.



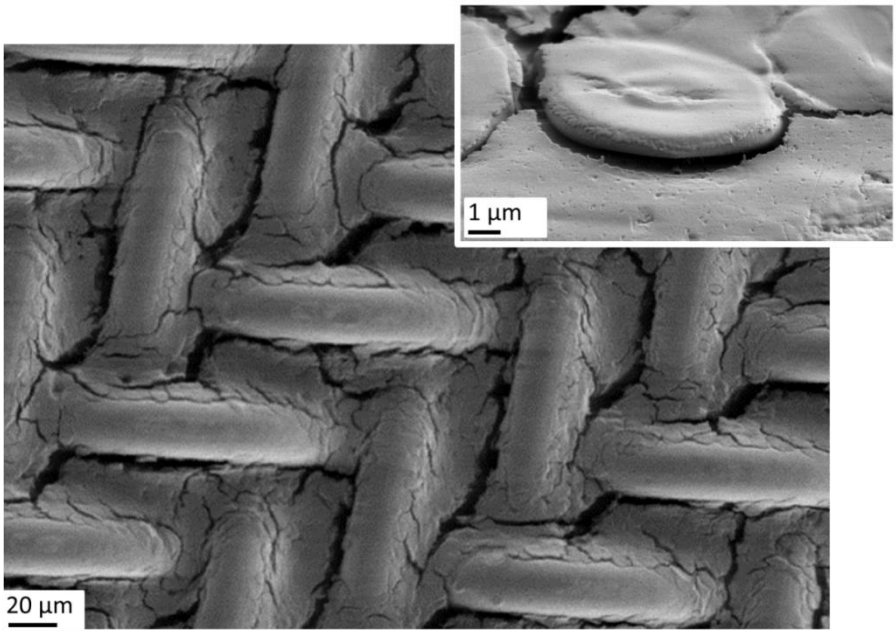
Supplementary Figure S5. Effect of whole human blood on superamphiphobic mesh. SEM image of a superamphiphobically coated mesh after whole human blood was pumped for 3 h in a closed system. The image is almost undistinguishable from those taken before the start of the measurement (Fig. 1b).



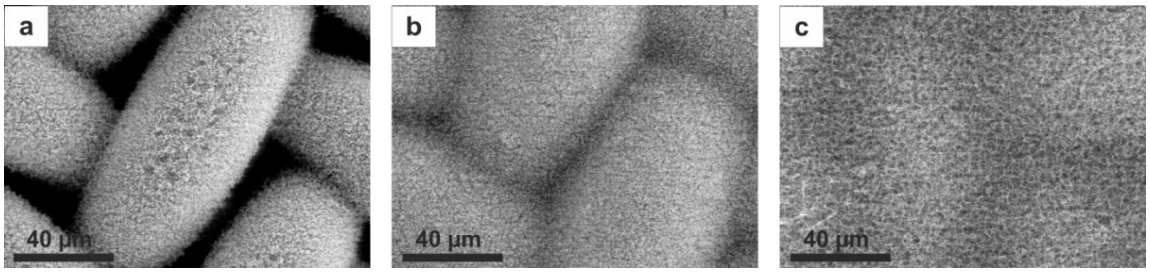
Supplementary Figure S6. **Effect of whole human blood on a hydrophobized steel mesh.** Image taken by optical microscopy of a 6 µL sized drop of blood on a fluorinated mesh. To verify that superamphiphobicity is essential for blood repellency we hydrophobized a metal mesh and put a drop of blood 6 ± 1 µL on the coated mesh. To hydrophobized the surface, the mesh was put in oxygen plasma for 2 min to activate the surface. Next, it was placed into a desiccator together with a glass vessel filled with 300 µL trichloro(1H,1H,2H,2H-perfluorooctyl)silane. The pressure in the desiccator was reduced to 250 mbar and the meshes were allowed to silanize for 2 h. The blood formed a contact angle of 139° ± 2° and rolled off after tilting the surface by 60°.



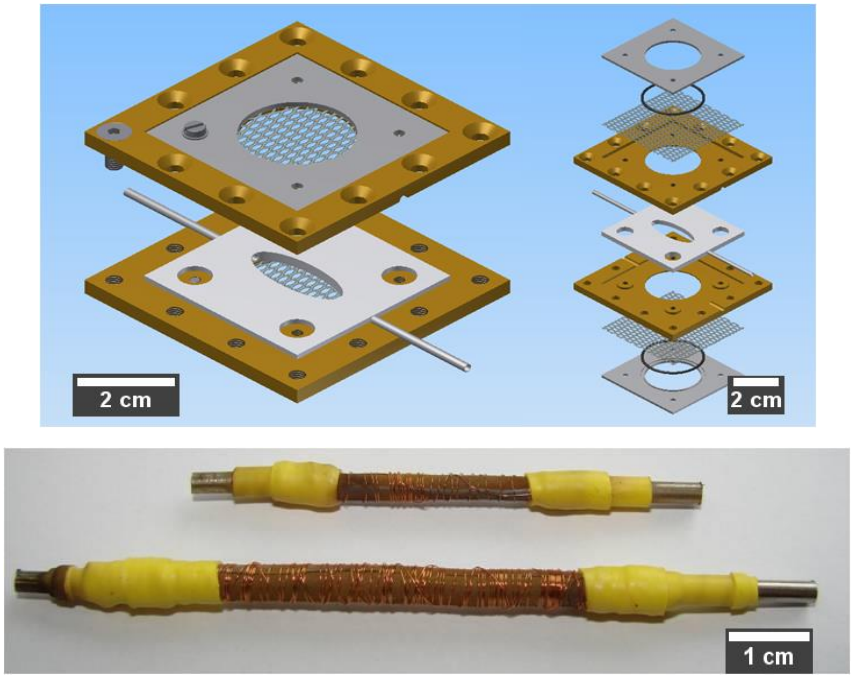
Supplementary Figure S7. No adhesion of resting blood on a superamphiphobic membrane. SEM image of a superamphiphobic layer after 48 h exposure to blood. Blood was deposited on a superamphiphobic membrane without any further movement for 30 min, 4 h 24 h and 48 h. After the specified times the blood was removed by tilting the surface. The samples at each time point was examined with scanning electron microscopy. Even after 48 h exposure to blood, no blood residues, especially no cells, were found on the superamphiphobic meshes.



Supplementary Figure S8. Metal mesh after 2 h exposure to blood. Inset: Magnified view of a deposited red blood cell.



Supplementary Figure S9: Scanning electron microscopy images of meshes after different sooting times. The thickness of the highly porous superamphiphobic layer increased from roughly 15 µm (a) to roughly 30 µm (c). The sooting times increased from about 45 s to 60 s. Mesh size: 8 cm^2.



Supplementary Figure S10: Flow through cells. Schematic of the elliptical flow cell (top) and photo of two superamphiphobic tubes (bottom).