Supporting Information

Cell-micropattern based on silicone-oil-modified sliperry surface

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Supporting Figures

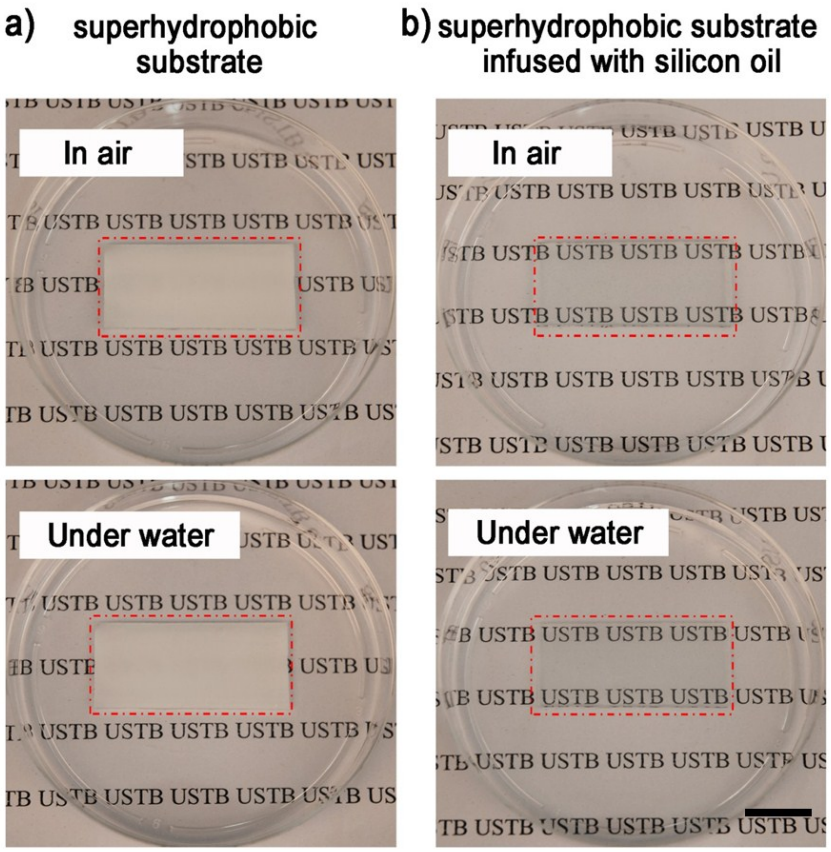

Figure S1. Optical transparency properties of nanodendritic silica substrate. a) Superhydrophobic substrates are all opaque in air and under water. b) The substrates become transparent when spread silicon oil onto the superhydrophobic surface. Scale bar: 1 cm.

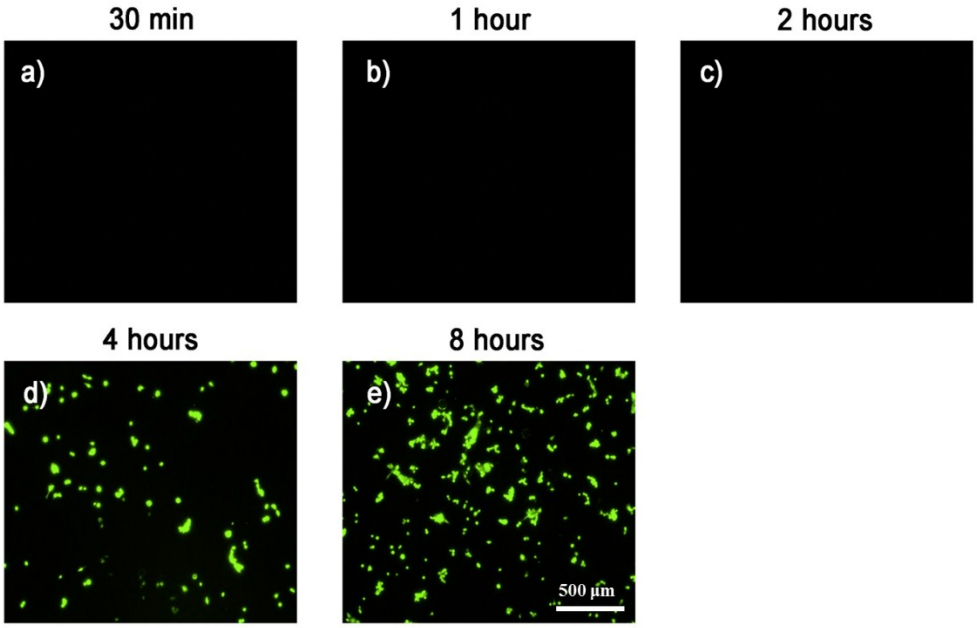

Figure S2. Anti-cell adhesion of air-assisted superhydrophobic substrate for a) 30 min, b) 1 hour, c) 2 hours, d) 4 hours, e) 8 hours cell culture by immersing the superhydrophobic substrate into the medium containing NIH/3T3 cells with concentration of $1*10^5$ ml^{-1}.

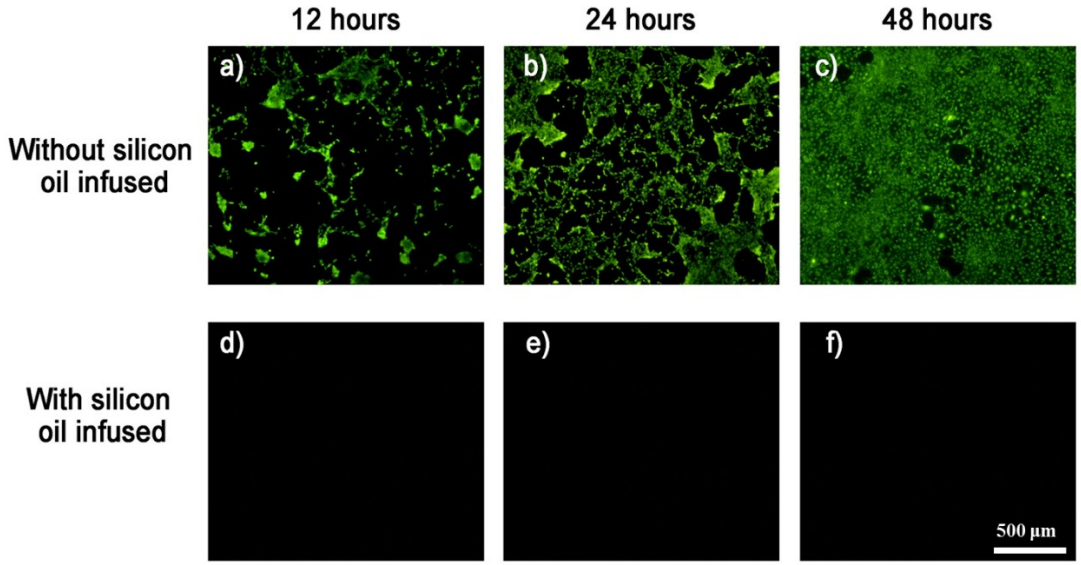

Figure S3. Comparison of long-term anti-cell adhesion capability between air-assisted superhydrophobic substrate (a-c) and silicon-oil modified superhydrophobic substrate (d-f) for 12 hours, 24 hours and 48 hours cell culture.

Materials

Acetone (>99.5%, AR), ethanol (≥ 99.8%, GR), sulfuric acid (H2SO4, 98%, AR), hydrogen peroxide (H_2O_2, 30%, AR) and Ammonia solution ($NH_3 \cdot H_2O$, 25%, AR) were purchased from Beijing Chemical Works. Tetraethoxysilane (TEOS), octadecytrichlorosilane (OTS), and Calcein-AM were purchased from Sigma-Aldrich. Silicon oil (20cs) was purchased from Nusil. Phosphate buffer solution (PBS) and penicillin-streptomycin were purchased from Thermo Scientific. Dulbecco's Modified Eagle's Medium (DMEM) growth medium were purchased from Neuronbc Laboratories Co., Ltd. Fetal Bovine Serum (FBS) was purchased from Fisher Scientific. Trypsin-EDTA (0.25%) and fluorescent dye DiD was purchased from Invitrogen. NIH/3T3 cell line (mouse embryonic fibroblast cell line) was purchased from Beijing Xiehe Cell Resource Center. Six-well cell culture plates were purchased from Corning Incorporated (Costar). Photomask (stainless steel) were purchased from Beijing Zhongjingkeyi Technology Co., Ltd. All water used in this work is ultrapure MilliQ water. All of these materials were used without further processing.

Preparation of nanodendritic silica substrate

The nanodendritic silica substrate was fabricated according to previous reports.[1-2] Firstly, the glass substrate was cut into 1cm*1cm and cleaned by Piranha solution (the mixture of 98% H_2SO_4 and 30% H_2O_2, 7:3(v/v) at 100℃ for 1hour.). Then ultrasonicated in acetone, ethanol and ultrapure water for 10, 10 and 5 min at room temperature (R.T.), respectively, then blown dry with nitrogen gas (N_2). Secondly, a layer of carbon soot was deposited on the cleaned glass slide by holding and horizontally moving the substrate in the flame of a burning candle. Thirdly, the candle soot layer was coated with silica shell by chemical vapor deposition(CVD) of TEOS (4ml) at 30℃ using ammonia solution (4ml) as catalyst in a desiccator for 20 h. Finally, the candle soot particles were removed by calcinating at 550 ºC for 2 h.

Fabrication of superhydrophilic-superhydropjobic micropatterned substrate

The nanodendritic silica coating was immersed in anhydrous toluene (99.8%) solution containing 4‰ octadecytrichlorosilane (OTS) for 1 h at room temperature.

Subsequently, the OTS-modified nanodendritisilica coating was rinsed with toluene, ethanol, and ultrapure water, respectively, followed by baking at 80 °C for 10 min. A high-pressure mercury lamp (at about 150 mW cm^{-2}) was used to irradiate the OTS-modified nanodendritic silica coating through a photomask for 40 min. The non-irradiated part remained superhydrophobic, while the UV irradiated regions became superhydrophilic.

References

[1] X. Deng, L. Mammen, H. J. Butt, D. Vollmer, *Science* **2012**, 335, 67.

[2] G. Yang, H. Liu, X. Liu, P. Zhang, C. Huang, T. Xu, L. Jiang, S. Wang, *Adv. Healthcare Mater*. **2014**, 3, 332.