

**Supporting Information for**  
**Slippery Surface Based on Lubricant Infused Hierarchical Silicon Nanowire**  
**Film**

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**Experimental Methods**

**Si Nanowire (NW) Thin Film Fabrication** Si NW film networks were synthesized using a gold catalyzed vapour-liquid-solid approach.

Briefly, aqueous solution containing Au nanoparticles of 50 nm diameter (Ted Pella) were dispersed on Si substrate covered with 600 nm SiO<sub>2</sub> on surface (SiO<sub>2</sub>/Si, Nova Electronic Materials). The SiO<sub>2</sub>/Si substrate was pre-coated with poly-L-lysine (Sigma-Aldrich) to enhance nanoparticle absorption. The solution was incubated on substrate at room temperature for 10 min, and the extra Au nanoparticles was rinsed off with DI-water. Si NW film was then grown at 450 °C for 1.5 h using SiH<sub>4</sub> as the silicon reactant (2.5 sccm) and H<sub>2</sub> as the carrier gas (60 sccm) with a total pressure of 40 Torr.

**Growth of ZnO Nanospikes**

Branched ZnO nanowires were synthesized using hydrothermal method. 50 nm ZnO thin layer was sputtered on Si nanowire film surface as a seed layer, then the sample was incubated in aqueous solution containing 25 mM zinc nitrate hydrate [Zn(NO<sub>3</sub>)<sub>2</sub>•6H<sub>2</sub>O, Sigma-Aldrich] and 25 mM hexamethylenetetramine (C<sub>6</sub>H<sub>12</sub>N<sub>4</sub>, HMTA, Sigma-Aldrich) for 2 h at 80 °C. After reaction, the samples were rinsed for five times with DI-water.

**Synthesis of Vertical ZnO Nanowires**

Si wafer was sputtered with 50 nm ZnO thin layer. The wafer was incubated in aqueous solution containing 25 mM Zn(NO<sub>3</sub>)<sub>2</sub>•6H<sub>2</sub>O and 25 mM HMTA for 2 h at 80 °C. After reaction, the substrate was rinsed for five times with DI-water.

### **Fluorinated Functionalization**

The nanowire film sample was treated with anhydrous heptane solution containing 2 wt% perfluorooctyltriethoxysilane (C<sub>14</sub>H<sub>19</sub>F<sub>13</sub>O<sub>3</sub>Si, Sigma-Aldrich) for 12 h at 60 °C. The samples were rinsed with heptane for 3 times, followed by rinsing with acetone for 3 times, and then calcinated at 120 °C for 30 min.

### **Lubricant Infusion**

The fluorinated samples were impregnated with lubricating liquid, DuPont Krytox 100, by placing the lubricating liquid on top of the substrate to allow the infusion of lubricant into the porous nanowire network. After 30 min, the extra lubricant was removed.

### **Characterization**

The morphology of the samples were characterized with a field-emission scanning electron microscope (Zeiss). Energy-dispersive spectroscopy (EDS) analysis was performed using Oxford Instruments in collaboration with the SEM. X-ray photoelectron spectroscopy (XPS, PHI 5000) measurements were performed to analyze the surface composition.

### **Static Contact Angle Analysis**

Contact angles were measured with Goniometer measuring system to characterize the wetting properties. Deionized water and various liquids including cell culture medium (Thermo Fisher Scientific), blood (from C57BL/6 mice) and corn oil (Sigma-Aldrich) were used as probe liquids.

### **Statistical Analysis**

T-test was performed using Stata13 software for statistical data evaluation.

### **Liquid-repelling Study**

Liquid repellent property was investigated by depositing the test liquid drop of 5 µl on lubricant-infused surface. The sliding of liquid drops was recorded on a tilted surface at a tilt angle of 5°.

### **Abbreviations**

NWs, Nanowires

SLIPS, Slippery liquid infused porous surfaces

CA, Contact angle

CVD, Chemical vapor deposition

SEM, Scanning electron microscope

EDS, Energy dispersion spectroscopy

XPS, X-ray photoelectron spectroscopy

**Table S1. Summary of Contact Angle Measurements**

Abbreviation	Description	Contact angle (SD) (°)				Liquid Repelling		
		Water	cell medium	blood	oil	water	blood	oil
NWF	Nanowire film	118.3 (5.3)	65.0 (5.3)	57.1 (2.4)	-			
HNWF	Hierarchical nanowire film	137.5 (1.3)	85.9 (4.8)	67.0 (3.1)	-			
FS-F	Fluorinated flat substrate	69.6 (1.6)	64.8 (1.3)	-	-			
VNW-F	Fluorinated vertical ZnO nanowire	97.5 (1.9)	-	-	-			
NWF-F	Fluorinated nanowire film	157.4 (2.7)	102.5 (6.2)	96.3 (0.7)	17.7 (1.3)			
HNWF-F	Fluorinated hierarchical nanowire film	165.5 (1.8)	152.7 (2.4)	142.8 (3.3)	52.7 (1.6)	✓	×	×
L-NWF-F	Lubricant infused fluorinated nanowire film	-	-	93.4 (1.3)	57.6 (0.2)	×	×	×
L-HNWF-F	Lubricant infused fluorinated hierarchical nanowire film	-	-	93.0 (0.7)	62.5 (1.9)	✓	✓	✓