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Incorporation of superamphiphobic and slippery patterned materials for water collection inspired from beetle, cactus, and *Nepenthes*

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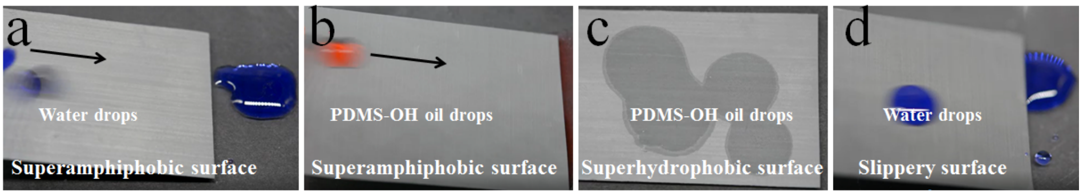

Fig. S1. (a, b) The superamphiphobic surface quickly repelled water and PDMS-OH drops. (c) PDMS-OH drops could fast immerse in superhydrophobic surface. (d) water drops quickly slid from the slippery surface.

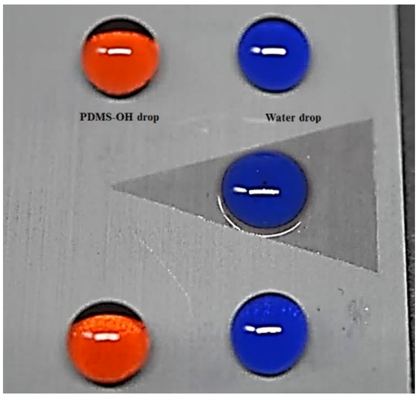

Fig. S2. Demonstration of hybrid superamphiphobic-slippery patterned surface. Water and PDMS-OH drops stood still on superamphiphobic surface, however, PDMS-OH drops spread on wedge-shaped superhydrophobic surface. Water was dyed in blue while PDMS-OH was dyed in red.

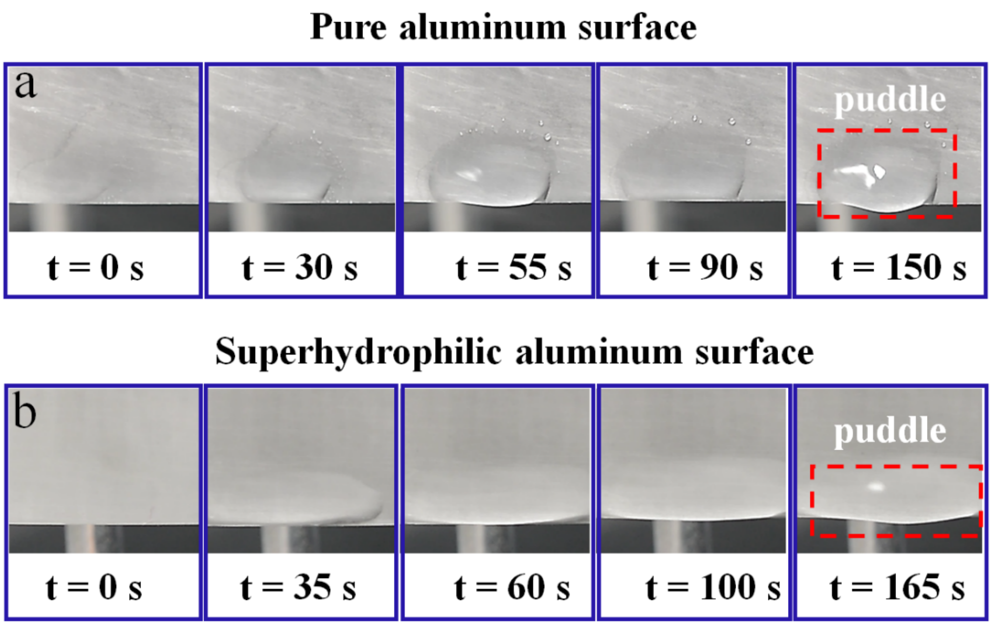

Fig. S3. Water collection processes using the pure aluminum surface (a) and superhydrophilic aluminum surface (b). Puddle phenomena (marked by the dotted-lined square) occurred in both conditions.

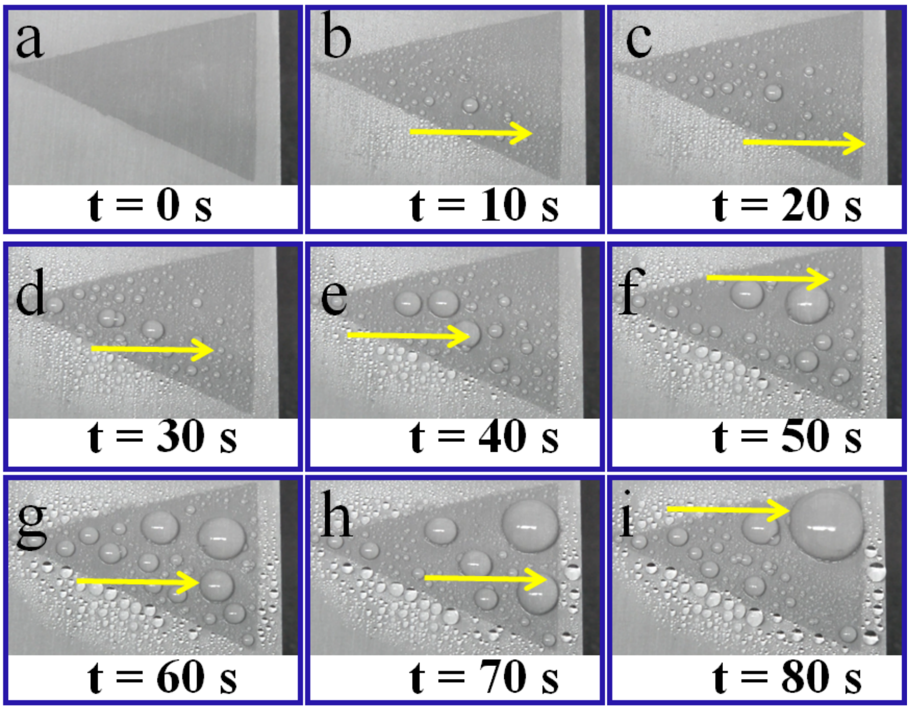

Fig. S4. Self-driven water transportation behavior of the wedge-shaped slippery surface.

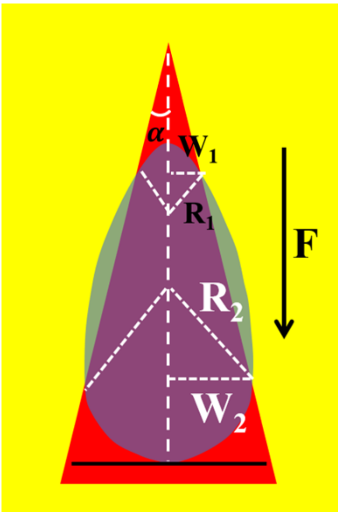

Fig. S5. The scheme of self-driven water transportation. The droplet length is approximate $\frac{\sin\alpha}{w_2 - w_1}$. The Laplace pressure on each side of the droplet is expressed as $\gamma(\frac{1}{R_1}-\frac{1}{R_2})$. The pressure gradient along the microchannel is $\gamma(\frac{1}{R_1}-\frac{1}{R_2})\frac{\sin\alpha}{w_2 - w_1}$. Since the droplet is wedge-shaped, water drop can be self-driven transported through Laplace pressure gradient.

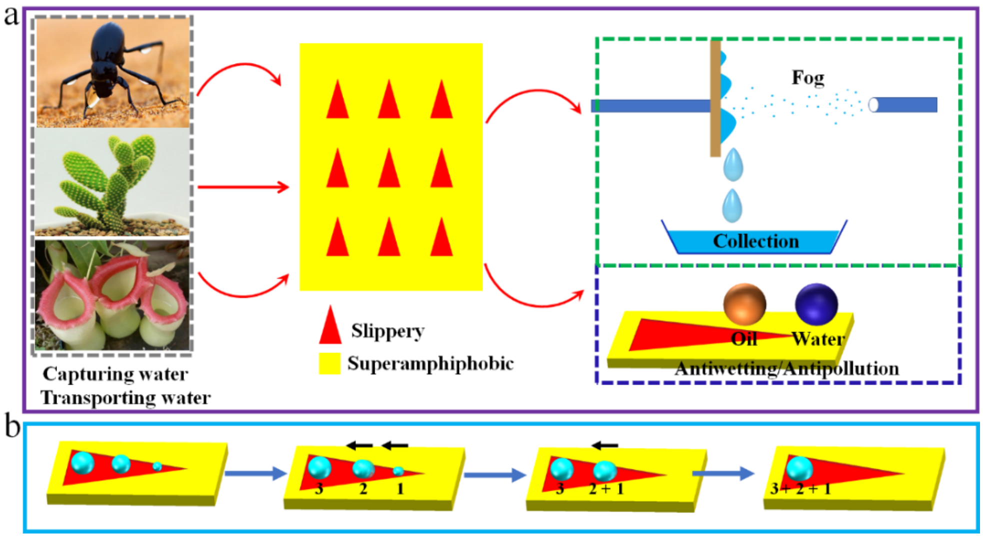

Fig. S6. The originally biological models for design of patterned surface.

Fig. S7. Self-cleaning tests of superamphiphobic (a) and slippery (b) surfaces.

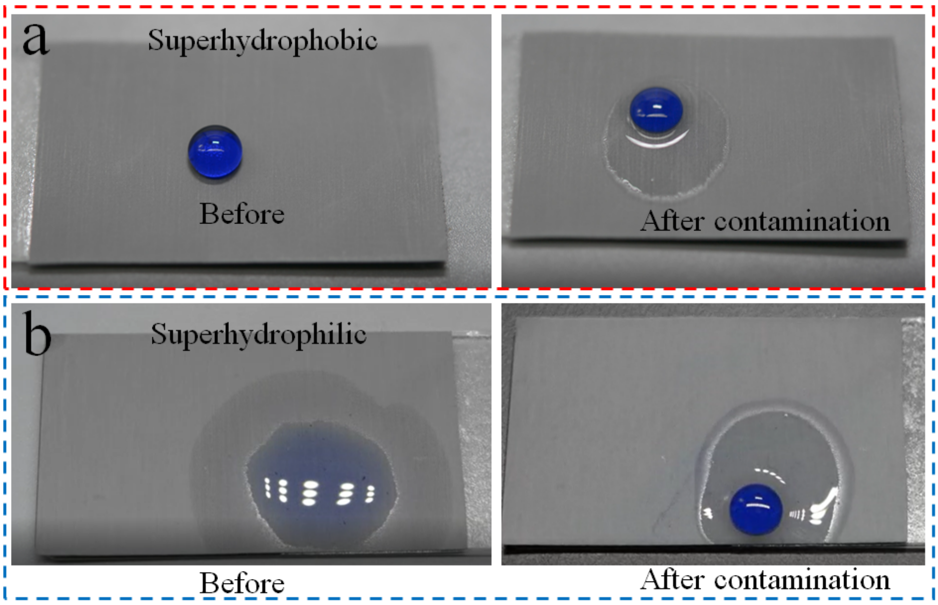

Fig. S8. Superhydrophobic (a) and superhydrophilic (b) surfaces immediately lose superhydrophobicity and superhydrophilicity after contaminated by oil.

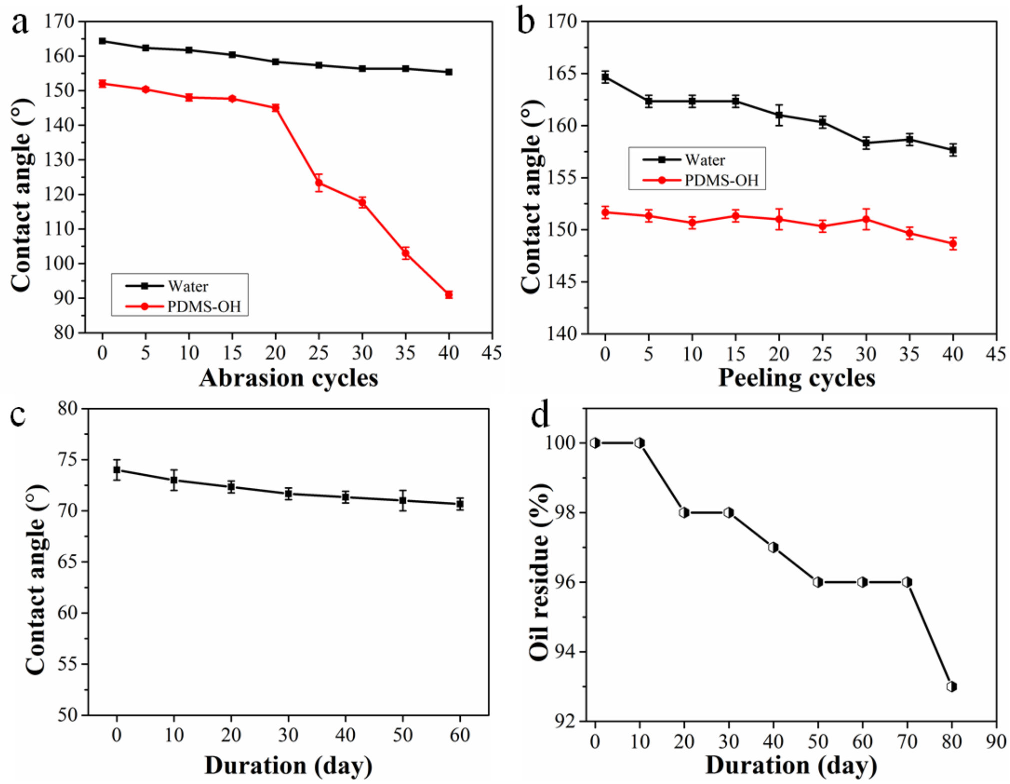

Fig. S9. (a) The relationship between CAs and SAs for water and hexadecane drops and abrasion cycles. (b) The relationship between CAs and SAs for water and hexadecane drops and peel cycles. (c) Changes in CAs and SAs according to the deposition duration in air for slippery surface. (d) Changes of oil residue according to deposition duration in air for slippery surface.

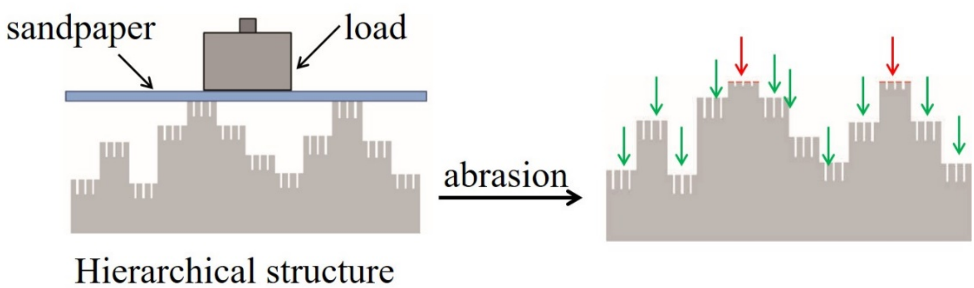

Fig. S10. Mechanism of abrasion resistance of the superamphiphobic and slippery surfaces with hierarchical structure.

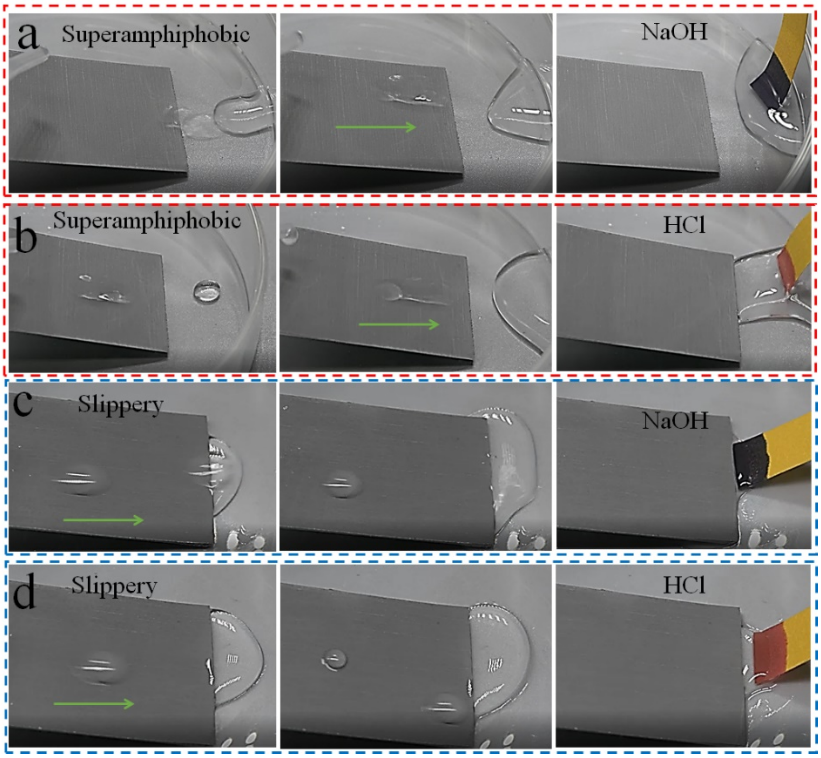

Fig. S11. Both superamphiphobic and slippery surfaces quickly repel 1M NaOH and 1M HCl drops.