

## Supplementary materials

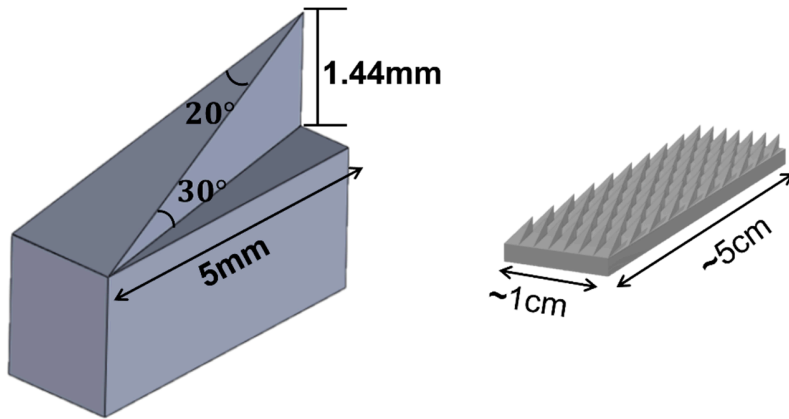


Figure S1. The design parameters of tetrahedron pattern.

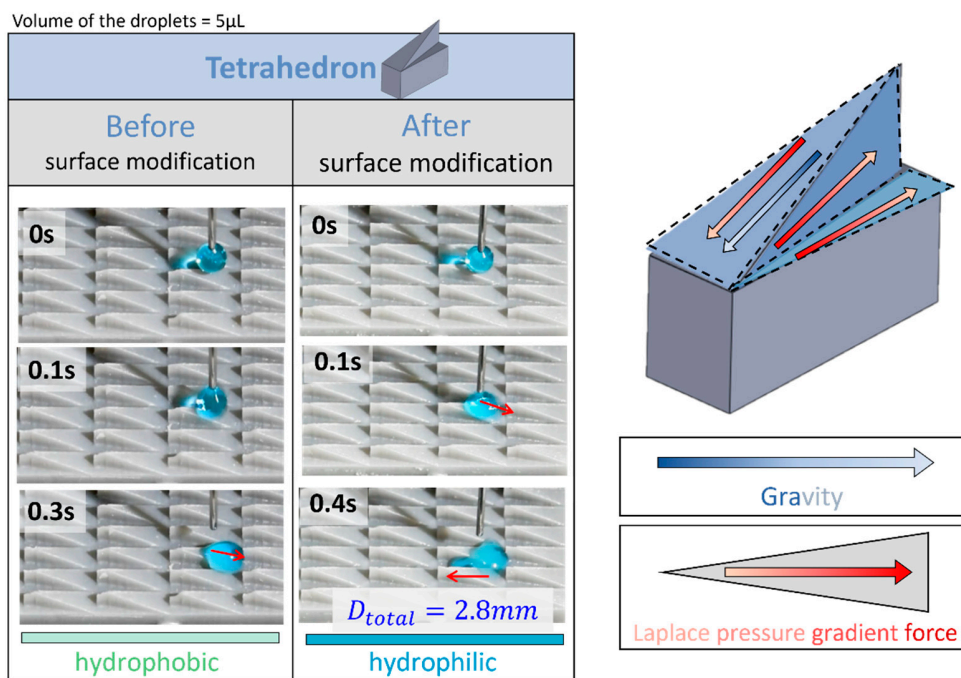


Figure S2. The dynamic wetting behavior of a water droplet on 3D printed ABS-like samples with (a) untreated; (b) modified tetrahedron patterns. The lighter blue indicates the surface is hydrophobic (CA $\sim$ 100°). The darker blue indicates the surface is hydrophilic (CA $\sim$ 10°).

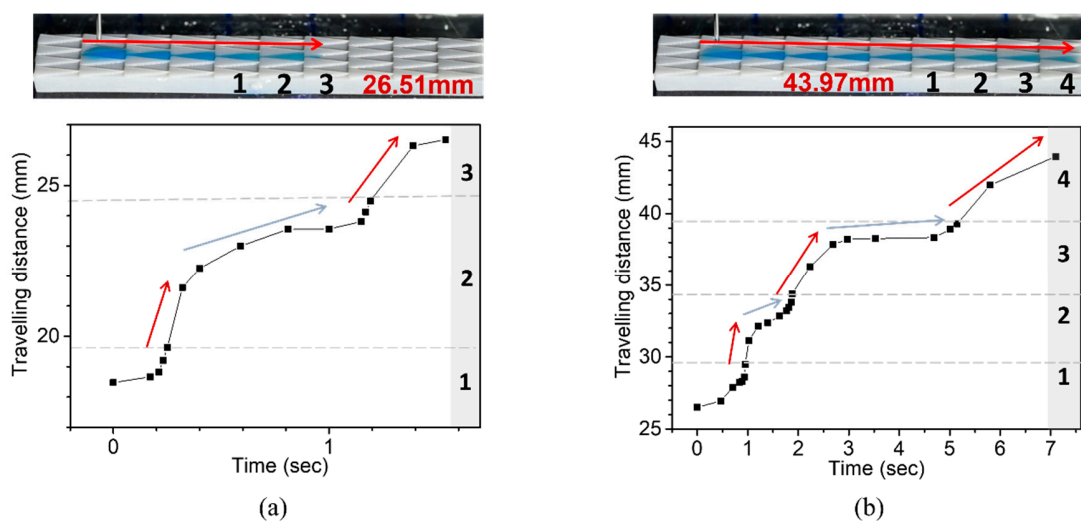


Figure S3. (a) Plot of the traveling distance versus time on the multi-gradient surface. The numbers 1-3 labeled are associated with each triangular prism position. (b) Plot of the traveling distance versus time on the multi-gradient surface. The numbers 1-4 labeled are associated with each triangular prism groove

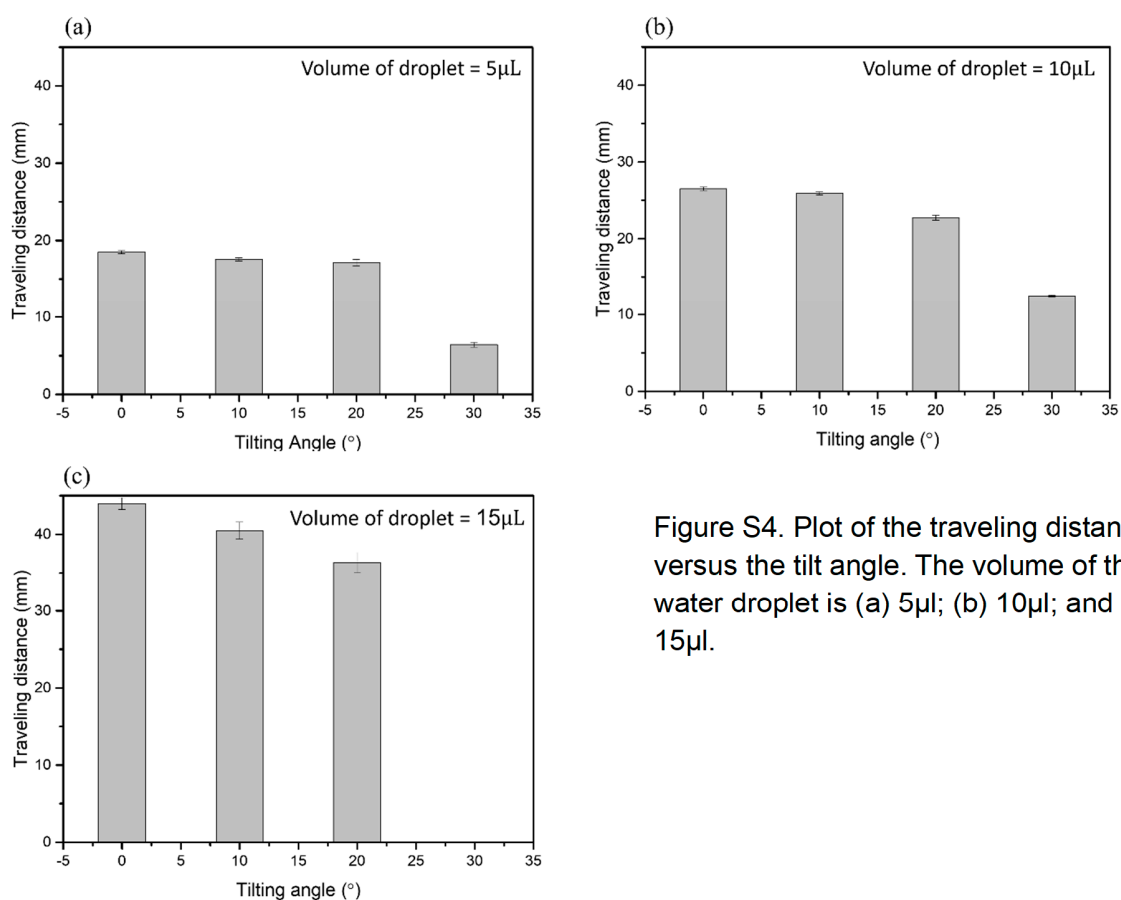


Figure S4. Plot of the traveling distance versus the tilt angle. The volume of the water droplet is (a) 5  $\mu\text{l}$ ; (b) 10  $\mu\text{l}$ ; and (c) 15  $\mu\text{l}$ .