Electronic Supplementary Material (ESI) for Soft Matter.

Tunable Adhesion and Slip on a Bio-mimetic Sticky Soft Surface

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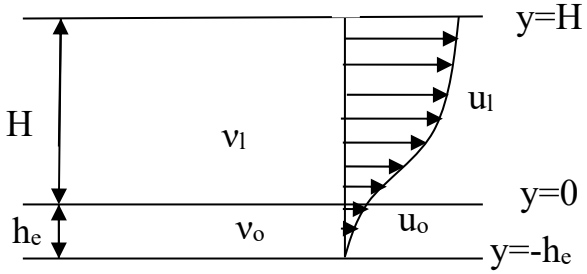
Online Supporting Information

S.1 Two-fluid Model for Apparent Slip



Governing Equations:

$$0 = -\frac{dp}{dx} + \mu_l \frac{du_l}{dy} \quad (1)$$

$$0 = -\frac{dp}{dx} + \mu_o \frac{du_o}{dy} \quad (2)$$

Boundary conditions:

at $y = -h_e$, $u_o = 0$ (1) at $y = 0$, $u_o = u_l$ (2)

at $y = 0$, $\mu_l \frac{du_l}{dy} = \mu_o \frac{du_o}{dy}$ (3) at $y = H$, $\frac{du_l}{dy} = 0$ (4)

Apparent slip length:

$$b_{TFModel} = h_e \frac{\mu_{water}}{\mu_{oil}} \left(\frac{(H + h_e)}{H} \right) \left(\frac{h_e}{2H} + 1 \right)$$

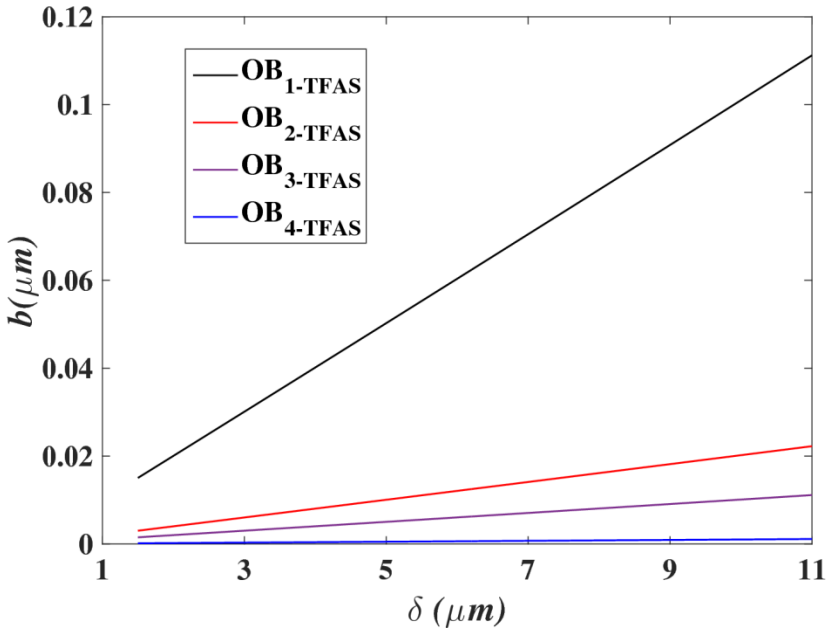


Fig. S1 Variation of slip length with the oil film thickness for different viscosities of the oil film.

Considering the above expression and noting that

$$b \propto (1+\cos\theta)^{-2} \quad (67)$$

we postulate:

$$b_{\theta-Slip\_QR} = h_e \frac{\mu_{water}}{\mu_{oil}} (1+\cos\theta)^{-2}$$

S.2**Static and dynamic wetting characteristics**

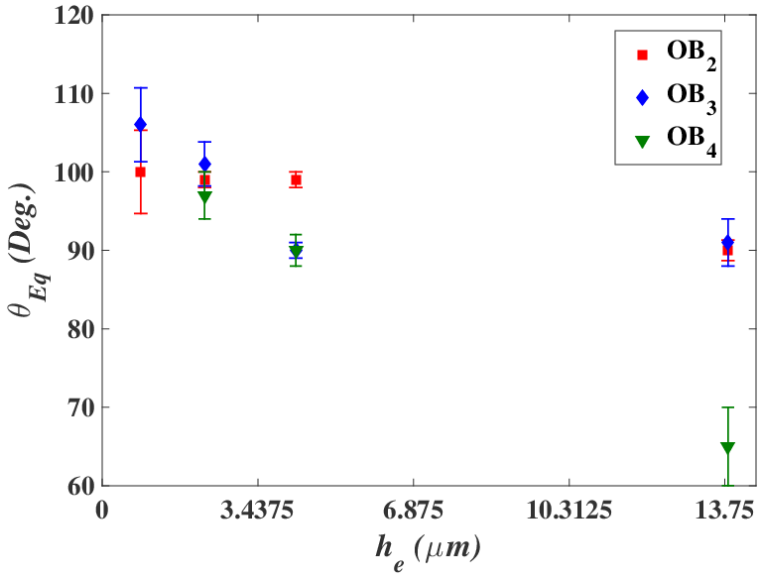


Fig S2. Contact angle subtended by a water droplet of 7µl volume on rose petal based oleoplaned surfaces of different conditions

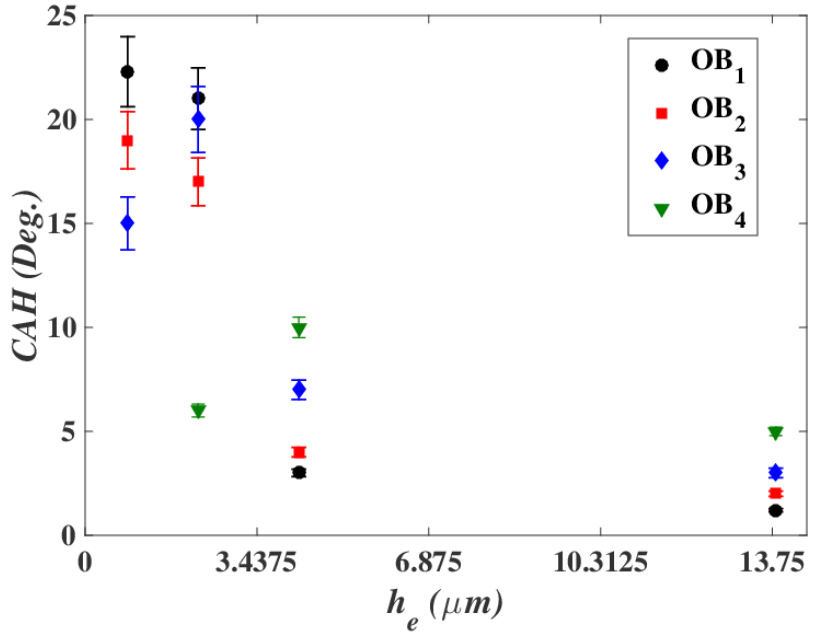


Fig S3. Variation of contact angle hysteresis for different rose petal based oleoplaned surfaces and in

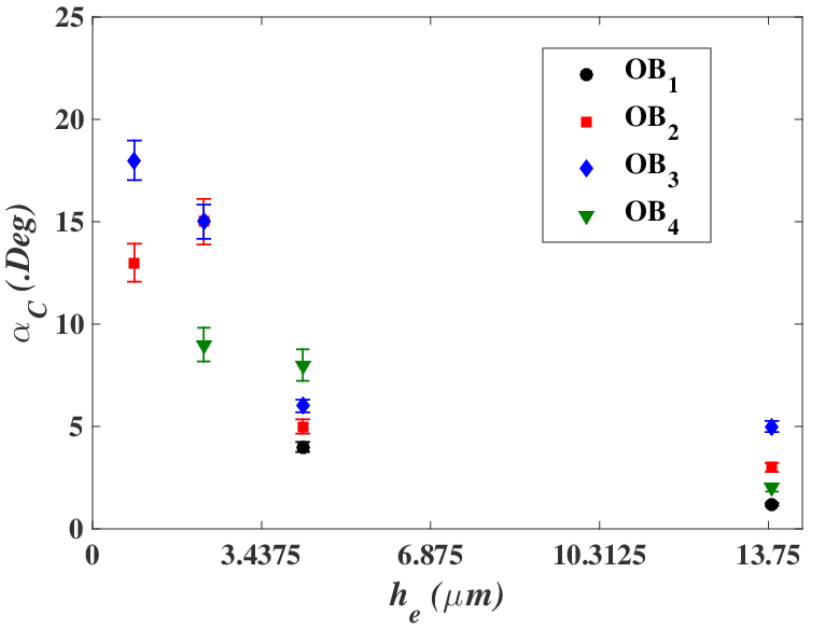


Fig S4. variation of the corresponding critical tilting angle with different oil film thickness and different viscosity silicone oil coated rose petal based oleoplaned surfaces.

Reference

67 D. M. Huang, C. Sendner, D. Horinek, R. R. and Netz and L. Bocquet, *Phys. Rev. Lett.*, 2008, **226101**, 1–4.