

Supporting Information

Surface-induced assembly of sophorolipids

Jessie Peyre¹, Ahmed Hamraoui¹, Marco Faustini¹, Vincent Humblot², Niki Baccile^{1*}

1 Sorbonne Universités, UPMC Univ Paris 06, CNRS, Collège de France UMR 7574, Chimie de la Matière Condensée de Paris, UMR 7574, F-75005 Paris, France. Corresponding author : niki.baccile@upmc.fr

2 Sorbonne Universités, UPMC Univ Paris 06, CNRS, Laboratoire de Réactivité de Surface, UMR 7197, 4 place Jussieu, 75005 Paris, France

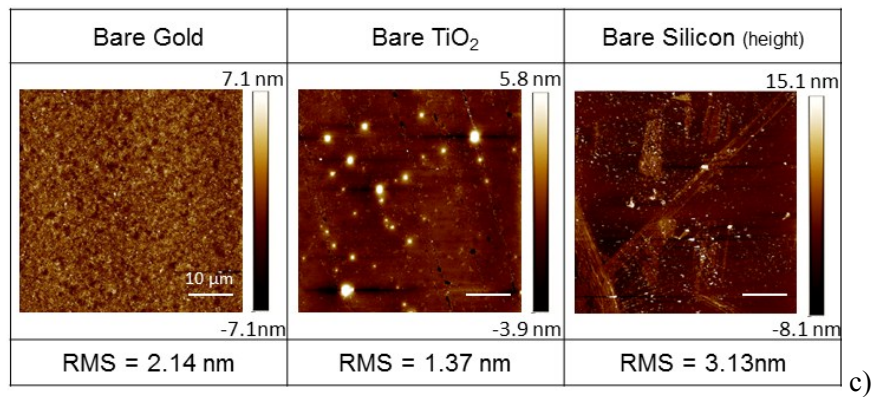
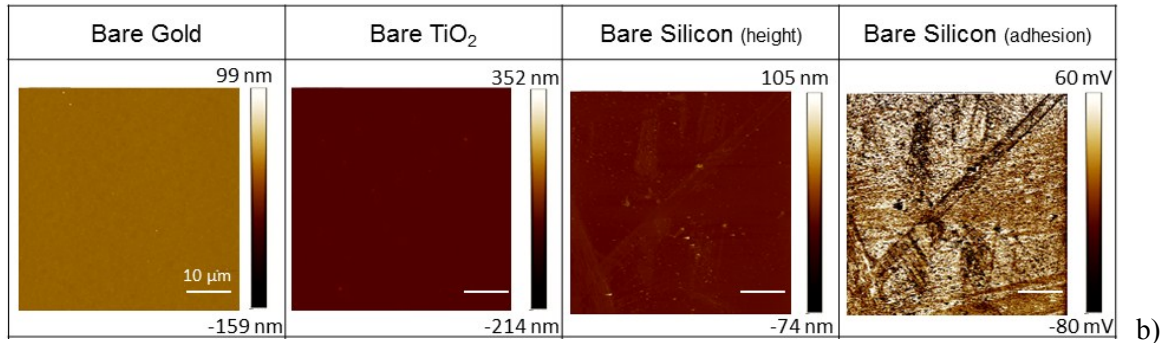
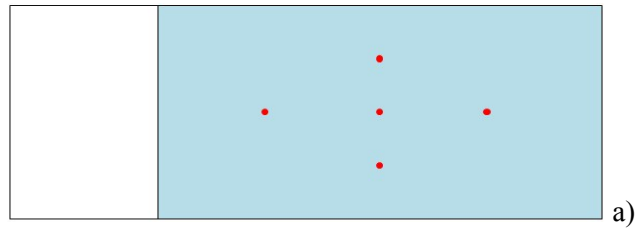


Figure S 1 : a) Scheme of the area scanned with AFM and SEM. Blue = film of sophorolipids; red dots = analyzed areas. b) Control AFM images of the bare gold, bare TiO₂, bare silicon substrates. For the latter, both the height and adhesion images are given. Images have been acquired under the same conditions as the AFM images presented in the main text. The choice of the z-scale is done in accordance with most of the AFM images presenting sophorolipid aggregates in the main text. c) Same control AFM images shown in b) but zoomed on the z-scale to highlight the surface roughness, RMS, given as root mean squared. Please refer to the main text for more information.

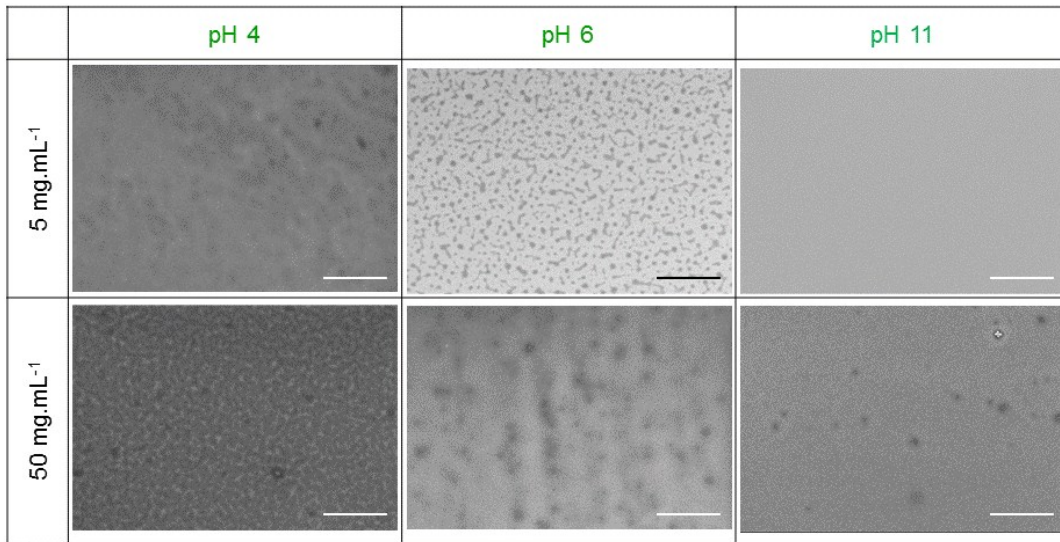


Figure S 2: SEM images from dip-coated solutions at different pH and concentrations, on silicon samples. Scale bars represent 50 μm .

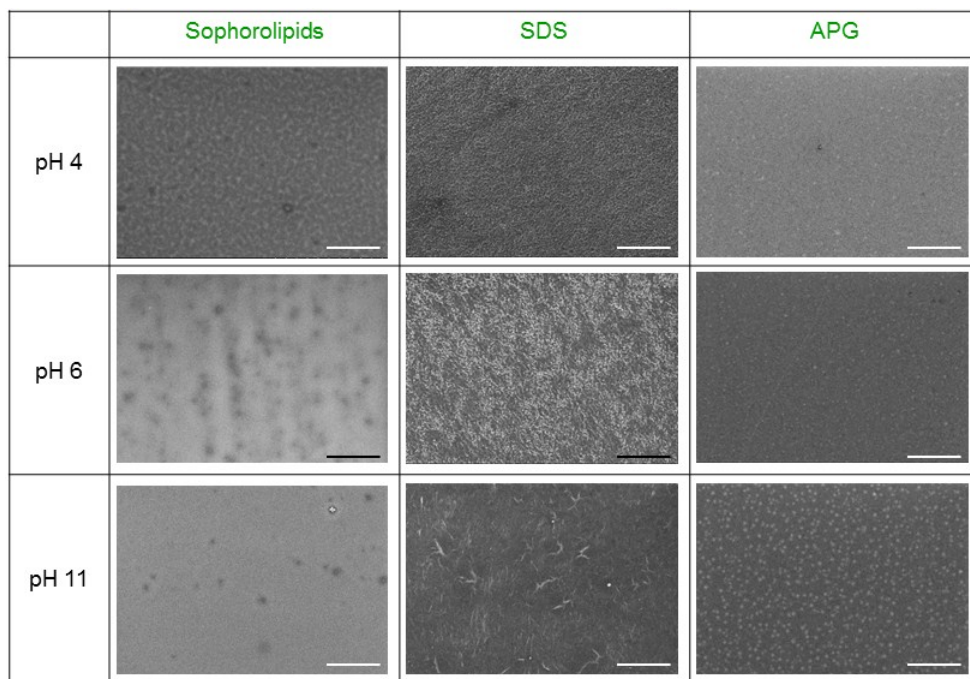


Figure S 3: SEM images from control molecules, dip-coated on silicon wafers. The SDS was chosen to model the negatively-charged carboxylic acid at basic pH. APG was picked to check the influence of the disaccharide headgroup. Scale bars represent 50 μm .

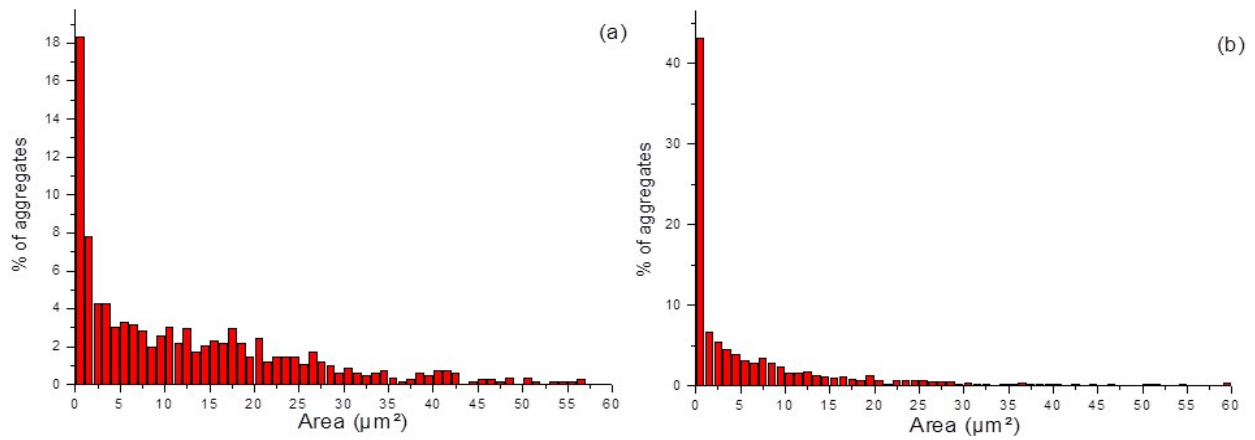


Figure S 4 : Area of aggregates obtained at pH 6 with a withdrawal speed of 0.01 $\text{mm}\cdot\text{s}^{-1}$ (a) and 1 $\text{mm}\cdot\text{s}^{-1}$ (b).

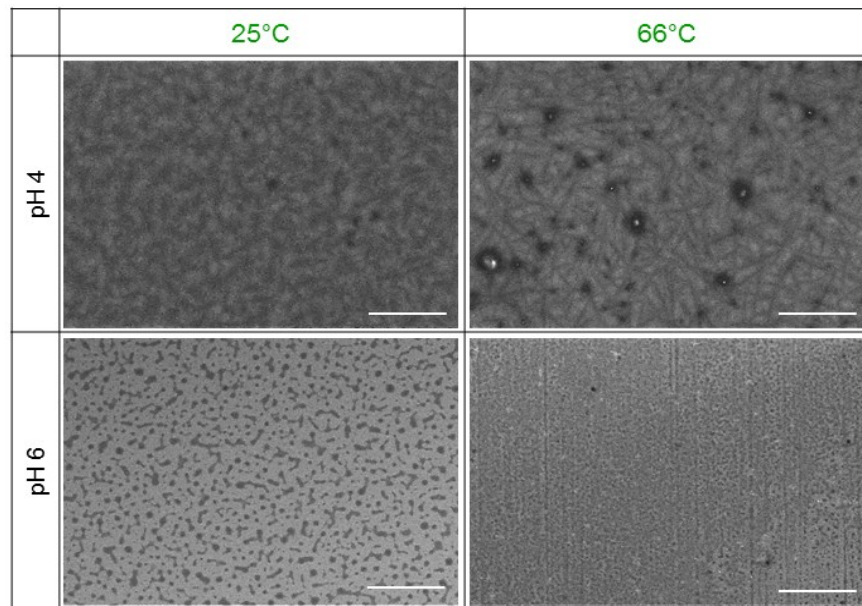


Figure S 5: SEM images showing the influence of temperature (25°C and 66°C) during the dip-coating process. The relative humidity is 22% and the withdrawal speed is 1 $\text{mm}\cdot\text{s}^{-1}$. Scale bars represent 50 μm .

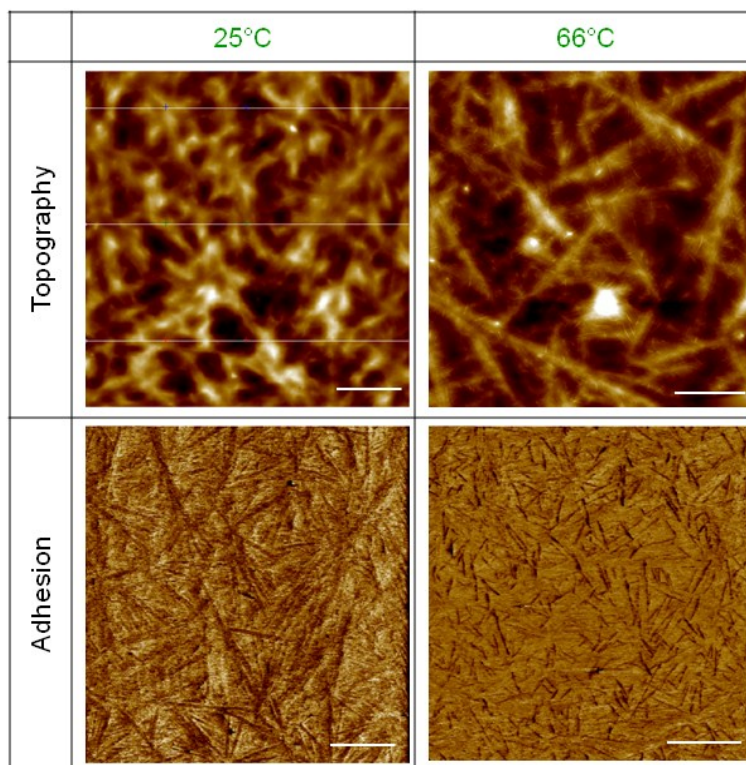


Figure S 6: AFM images showing the difference of the surface self-assembly of sophorolipids on silicon at 25°C and 66°C. Scale bars represent 10 μm .

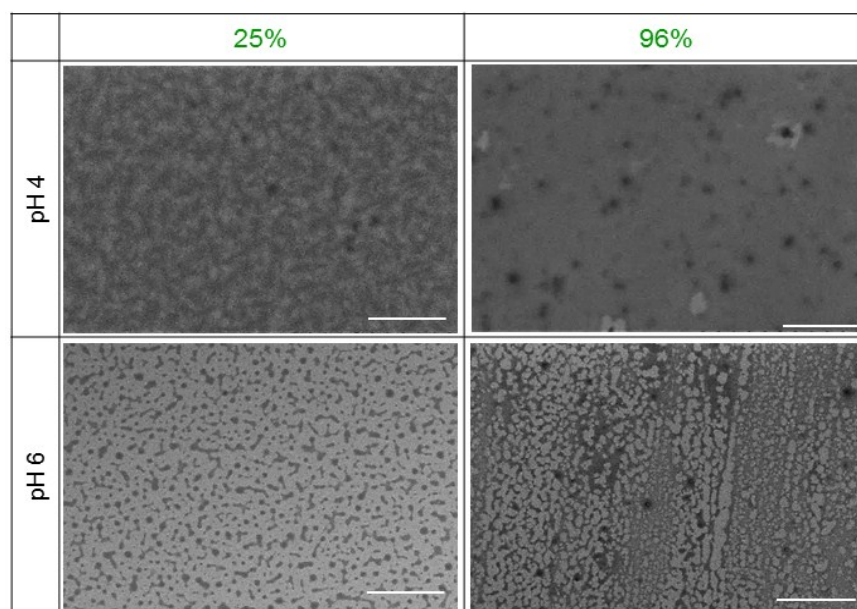


Figure S 7: SEM images showing the influence of relative humidity (25% and 96%) during the dip-coating process. The temperature is 24°C and the withdrawal speed is 1 $\text{mm}\cdot\text{s}^{-1}$. Scale bars represent 50 μm .

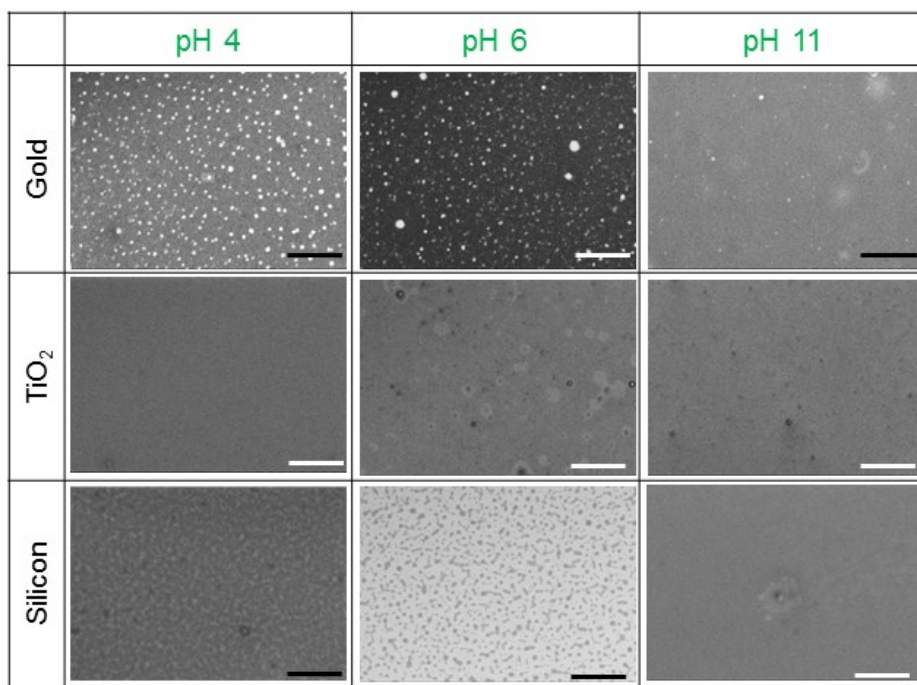


Figure S 8 : SEM images from dip-coated solutions at different pH onto different substrates (gold, TiO₂, silicon). Scale bars represent 50 μ m.

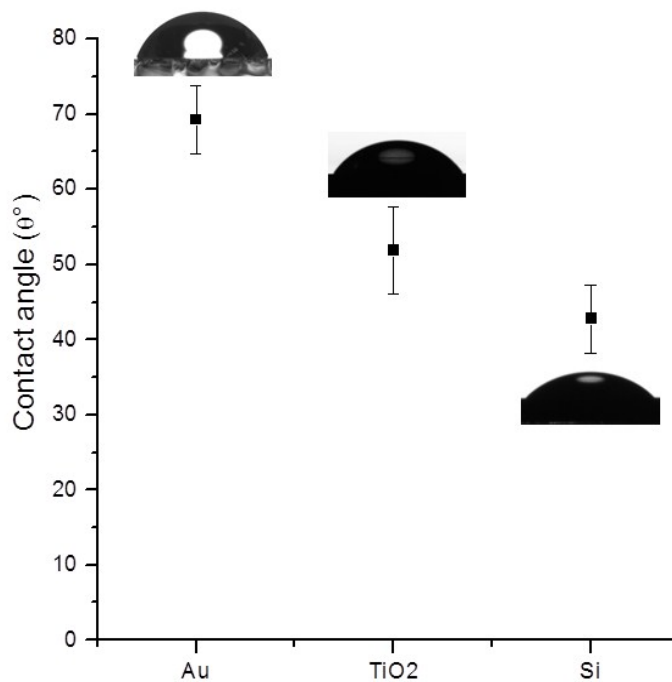


Figure S 9: Contact angle measures for each surface with milli-Q water. The highest contact angle was observed on gold surfaces ($69^\circ \pm 4^\circ$) and the lowest on silica ($43^\circ \pm 4^\circ$).

	Glycerol	Formamide	Diiodomethane
Gold	71	41	42
Titanium dioxide	43	38	52
Silica	41	11	52

Liquid	γ_L	γ_L^{LW}	γ_L^+	γ_L^-
Water	72.8	21.8	25.5	25.5
Diiodomethane	50.8	50.8	0	0
Formamide	58.0	39.0	2.28	39.6
Glycerol	64.0	34.0	3.92	57.4

Table S 1: Top: Mean values of contact angle (θ°) obtained after deposition of 3 drops of each solvent on the different surfaces. The diiodomethane has only a dispersive component so it allowed having information about the relative dispersive component of each material. Bottom: values of surface tension components relative to the solvents (in mJ.m^{-2}).