Supplementary Information: A polymer coating that is sticky yet repulsive to water and slippery yet attractive for oils

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Surface Synthesis – Schematic of the Plasma Chamber

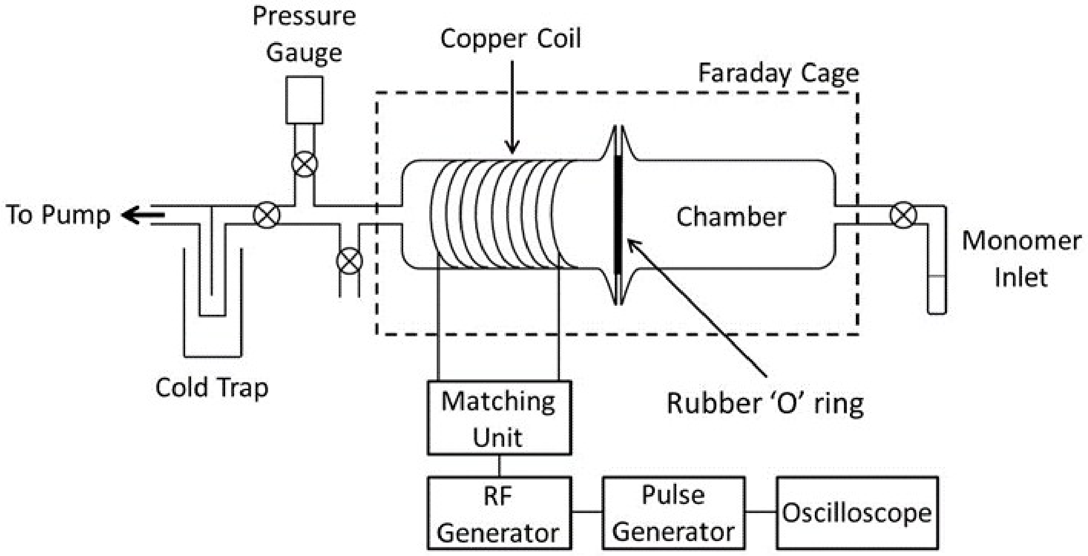

Figure S.1 Schematic of the plasma chamber used in the plasma polymerization experiments in this thesis. The dashed line around the main chamber represents the location of a Faraday cage, and the crossed circles represent Youngs taps. The radiofrequency (RF) generator produced a frequency of 13.56 MHz

Surface Characterization Methods

X-ray Photoelectron Spectroscopy (XPS) XPS studies were carried out using a Thermo Scientific K-Alpha spectrometer. In all cases, survey spectra were acquired by performing 5 scans at a range of binding energies from 0-1200 eV in steps of 0.4 eV. Regions of interest, typically spanning approximately 30 eV, were identified from the survey spectrum, and eight scans in steps of 0.1 eV were performed for each of these regions. The take-off angle was normal to the surface.

Polymer	**Peak Position (eV)**						
	$\underline{C}F_3$	$\underline{C}F_2$	$\underline{C}{=}O$	$\underline{C}{-}O$	$\underline{C}{-}CF_n$	$\underline{C}{-}C(O){=}O$	$\underline{C}{-}CH_n$
HEMA	-	-	289.0	286.8	-	285.8	285.0
PFAC-6	293.4	291.2	288.9	286.8	285.8	285.0	
HEMA-co-PFAC-6	293.6	291.4	288.8	286.7	286.0	285.0	

Table S.1 Peak positions and assignments from deconvoluted C(1s) XPS spectra. The hydrocarbon peak position is calibrated to be 285.0 eV. The full-width-half-maxima are: HEMA (1.15 eV), PFAC-6 (1.44 eV), and HEMA-co-PFAC-6 (1.58 eV). The narrower peaks in the HEMA spectrum made it possible to distinguish the two hydrocarbon peaks

Polymer	**Peak Areas (%)**						
	$\underline{C}F_3$	$\underline{C}F_2$	$\underline{C}{=}O$	$\underline{C}$—O	$\underline{C}$—CF_n	$\underline{C}$—C(O)=O	$\underline{C}$—CH_n
HEMA	-	-	17.4	29.6	-	17.7	35.4
PFAC-6	10.8	42.4	10.5	9.4	9.4	17.8	
HEMA-co-PFAC-6	7.0	28.4	13.2	12.8	11.5	27.1	

Table S.2 Relative peak areas from deconvoluted C(1s) XPS spectra

Atomic Force Microscopy (AFM) AFM Measurements were carried out using a Digital Instruments Multimode NanoScope IIIb in tapping mode. Tapping mode involves rastering an oscillating cantilever across the surface; the oscillations are then damped by interactions with the surface. The cantilevers used had a force constant of 40 N m^{-1} and a resonant frequency of 325 kHz. Data analysis was carried out in the NanoScope analysis program. Images were subject to a 2nd order flatten to remove bow, which is an artefact created by the scanner motion, prior to roughness measurements.

Contact Angle (CA) Goniometry Static and dynamic CA measurements were carried out using a Krüss Drop Shape Analyzer (DSA) 100. The probe liquids were *n*-hexadecane (γ = 27.5 mJ m^{-2}) and water (γ = 72.8 mJ m^{-2}). For static CA measurements, a 5 μl drop was dispensed from a motorised syringe fitted with a PTFE needle. The needle was brought close to the surface and the drop gently touched onto the surface. The profile of the drop was fitted computationally using the Krüss Advance software. For dynamic measurements, a 15 μl drop was deposited onto the surface as per the static CA measurement and the surface was slowly inclined using a tilting stage. The angle at which the droplet slid or rolled off was recorded as the tilting CA.