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Electronic Supporting Information

Suppressing *Pseudomonas aeruginosa* Adhesion via Non-Fouling Polymer Brushes

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Polymer Brushes

XPS and FTIR-GASR characterization

Poly(MeOEGMA) and poly(HPMA) brushes were prepared by surface initiated atom transfer radical polymerization (SI-ATRP) from a SAM of initiator. The chemical composition of the samples was evaluated by XPS and Fourier-Transform Infrared Grazing Angle Specular Reflection (FTIR-GASR) spectroscopy. Figure S1 depicts representative FTIR-GASR spectra of the SAM of initiator as well as the two polymer brushes i.e. poly(MeOEGMA) and poly(HPMA). Spectrum 1 corresponds to a SAM of ω-mercaptoundecylbromoisobutyrate, the ATRP initiator. Spectra 2 and 3, poly(MeOEGMA) and poly(HPMA) respectively, confirm the success in the grafting of the antifouling polymer brushes. In the C-H region, the polymer brushes show characteristic bands of CH_2 and CH_3 stretching modes of the oligo(ethylene glycol) methyl ether and 2-hydroxypropyl side chains and the aliphatic main chain. In the region below 1800 cm^{-1} spectrum 2 (poly(MeOEGMA) exhibit a strong band at 1730 cm^{-1} associated with the ester carbonyl and a family of bands having their origin in CH_2 scissoring (~ 1465 cm^{-1}), wagging (~ 1350 cm^{-1}), twisting (~ 1250 cm^{-1}), and rocking (~ 950 cm^{-1}) modes. The strongest band in the spectra is observed at 1145 cm^{-1} and can be assigned to the C-O-C stretching modes of the OEG subunits. The spectrum of poly(HPMA) (3) clearly show prominent bands at 1650 and 1540 cm^{-1} corresponding with amide I and II as well as typical bands of hydroxyls at 3375 cm^{-1}.

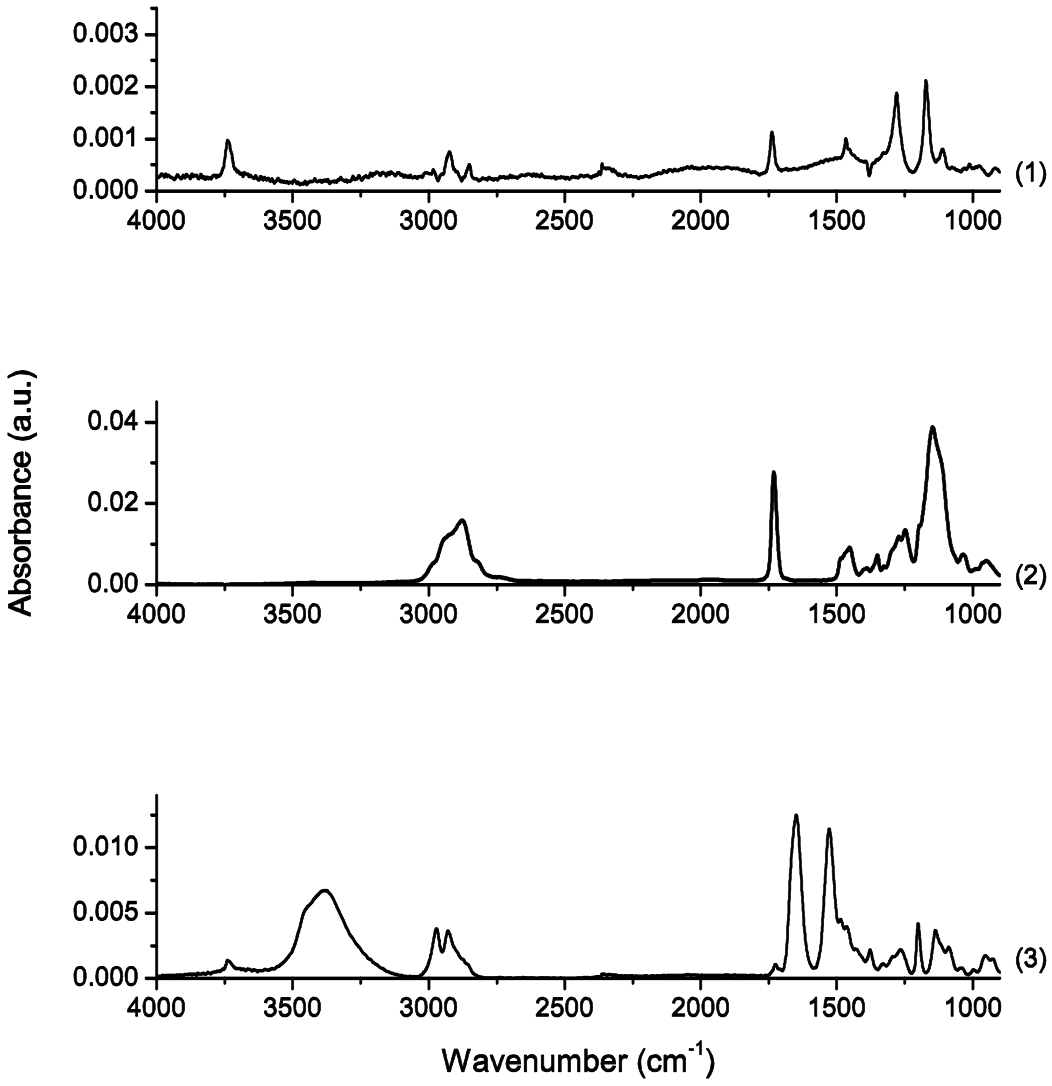

Fig. S1. FTIR-GASR spectra of surfaces: (1) SAM of ATRP initiator, (2) poly(MeOEGMA) and (3) poly(HPMA) brushes.

Protein fouling analysis via SPR

Adsorption of proteins is supposed to mediate the adhesion and proliferation of bacteria. Thus, the fouling from fetal bovine serum (FBS, 10% in PBS) and human serum (HS, 10% in PBS) was studied when the surfaces were contacted with the serum for 15 min and 10 h (Table S1).

Table S1. Fouling from FBS (10%) and HS (10%) observed after contact of 15 min and 10 h.

Surface	FBS (10%) ($pg \cdot mm^{-2}$)		HS (10%) ($pg \cdot mm^{-2}$)	
	15 min	10 h	15 min	10 h
Poly(MeOEGMA)	0	0	43	584
Poly(HPMA)	0	87	0	78

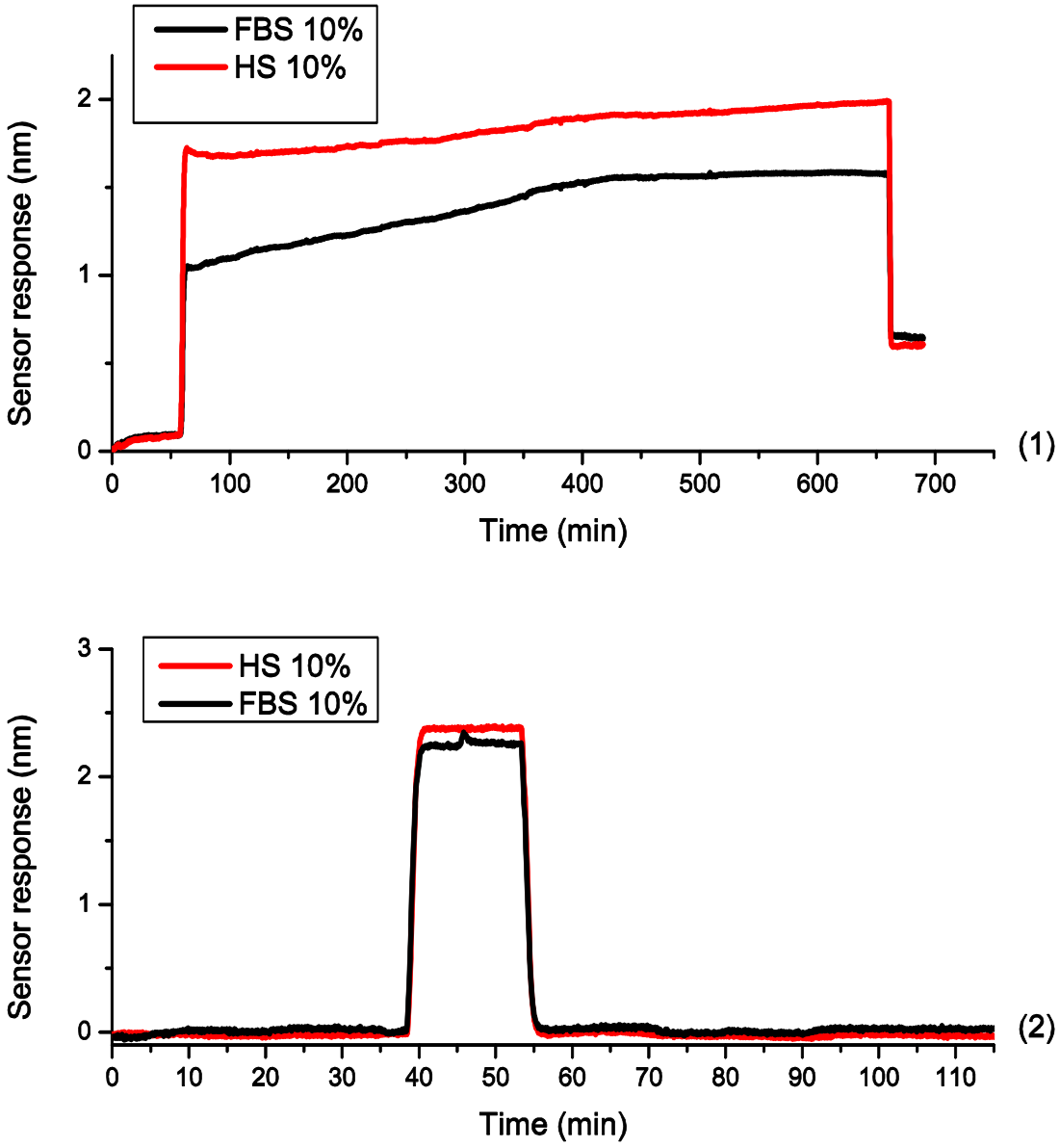

Fig. S2. Fouling from FBS (10%) and HS (10%) on poly(HPMA). Typical SPR sensograph for 10 h (1) and 15 min (2) contact.

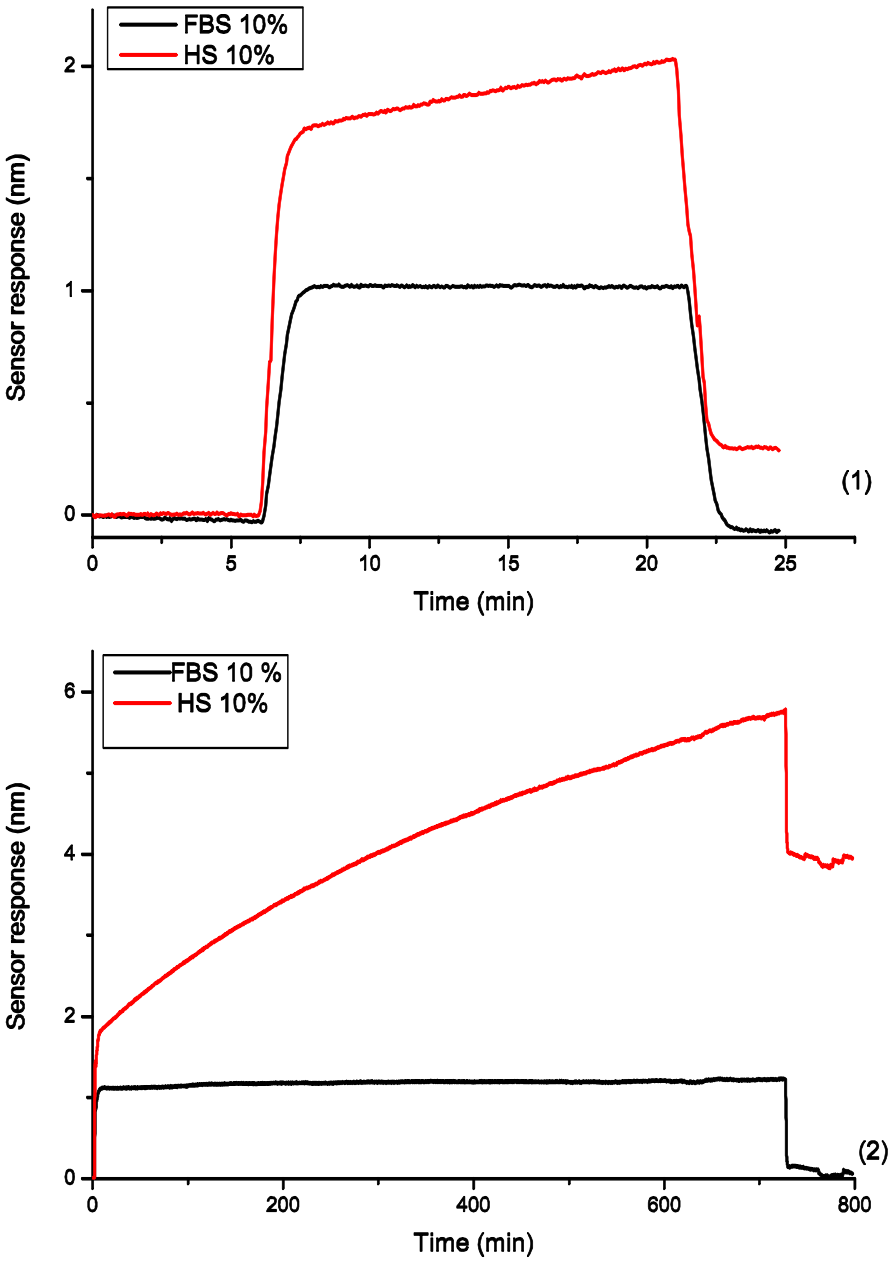

Fig. S3. Fouling from FBS (10%) and HS (10%) on poly(MeOEGMA). Typical SPR sensograph for 15 min (1) and 10 h contact (2).

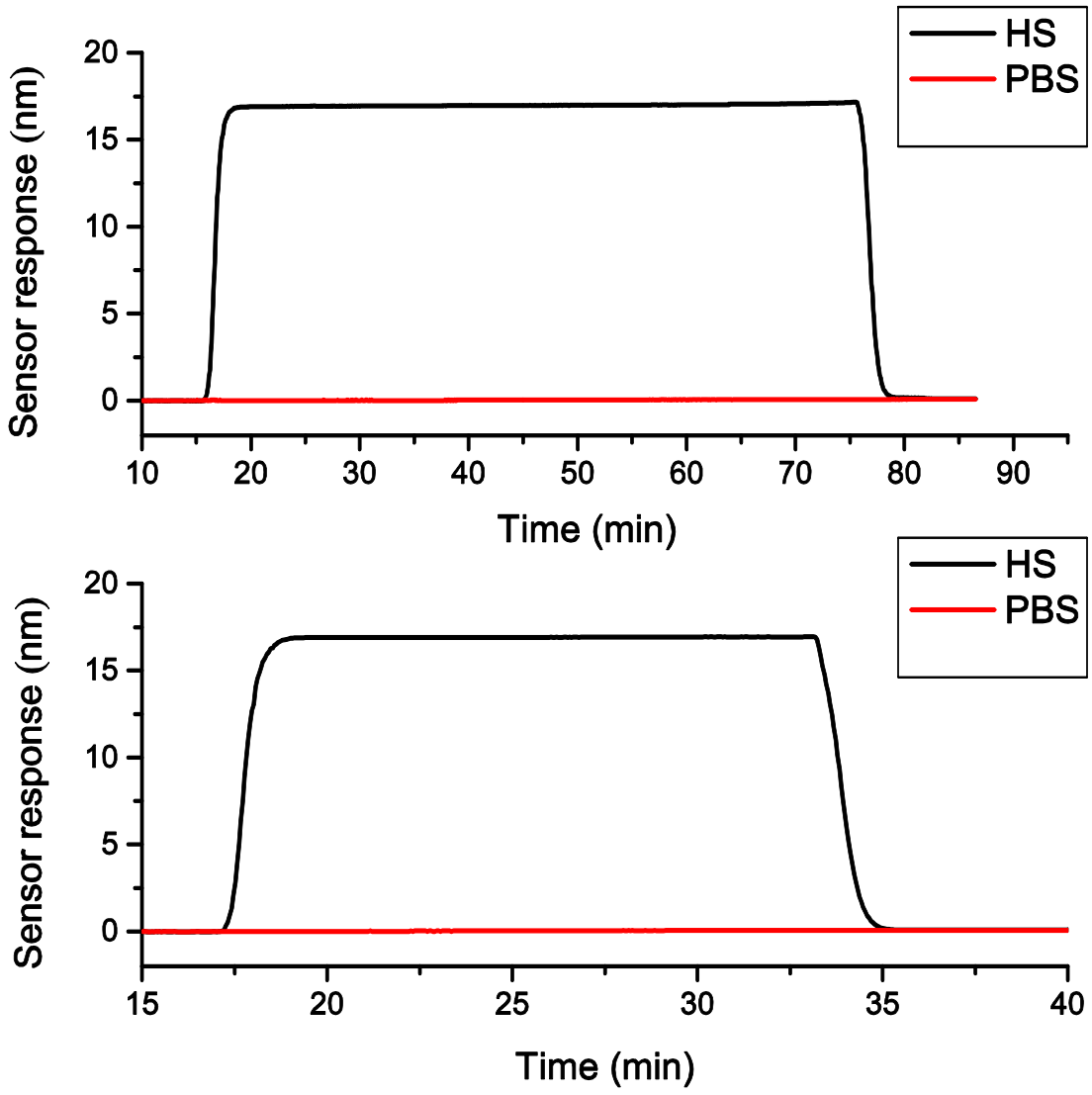

Fig. S4. Fouling from HS (100%) on poly(HPMA). Typical SPR sensograph for 1 h (1) and 15 min (2) contact.

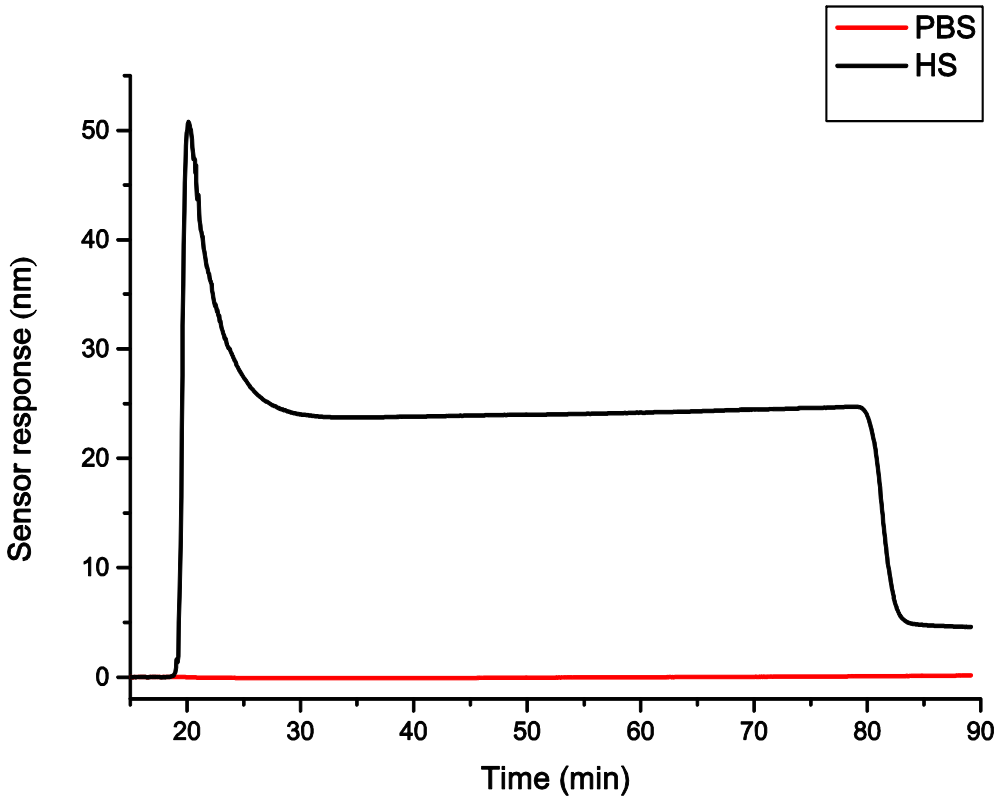

Fig. S5. Fouling from HS (100%) on poly(MeOEGMA) brushes. Typical SPR sensograph for 1 h contact.

Growth curves

The growth curves of three strains of *Pseudomonas* were determined using optical absorption. The absorption was measured using UV-Vis spectroscopy.

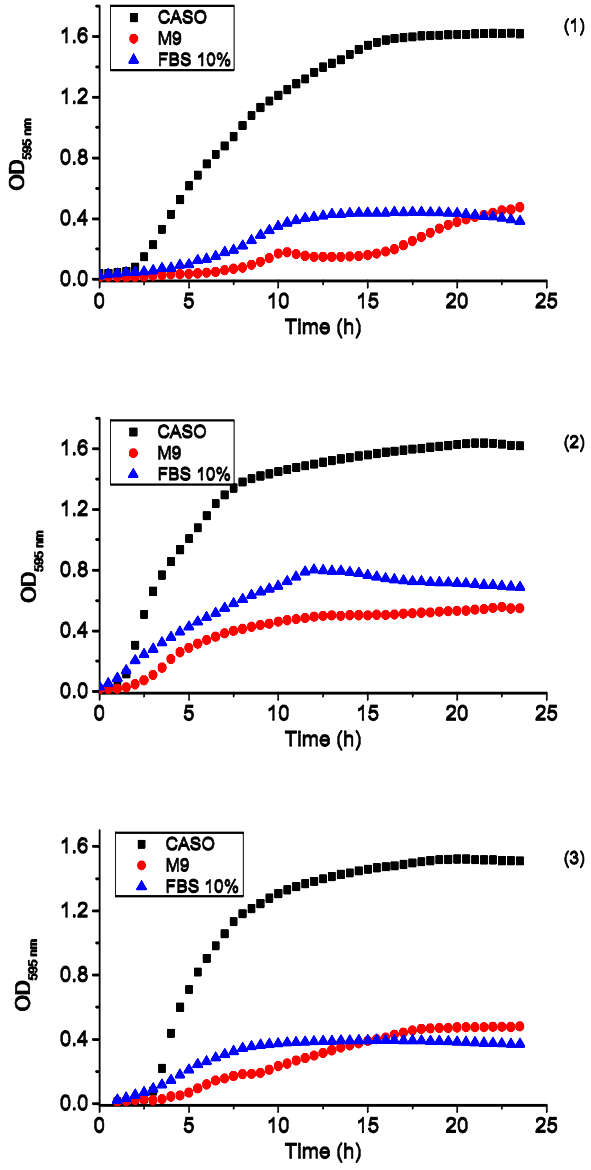

Fig. S6. Growth curve of *Pseudomonas* PA49 (1), PA01 (2) and PA30 (3) in CASO (black curves), M9 medium (red curves) and FBS 10% in DMEM (blue curves). The growth was determined by following the absorption at 595 nm.

Atomic Force Microscopy (AFM)

All images were acquired with a Multimode Atomic Force Microscope NanoScope IIIa (Digital Instruments) as topological scans in tapping mode in air, using silicon probes OTESPA (Veeco Instruments) with a nominal spring constant of 42 N m^{-1} and a tip radius of 7-10 nm. Areas of 5 × 5 μm^2 (512 × 512 pixels) were scanned at a rate of 1 Hz. The scans were analyzed using Gwyddion software.

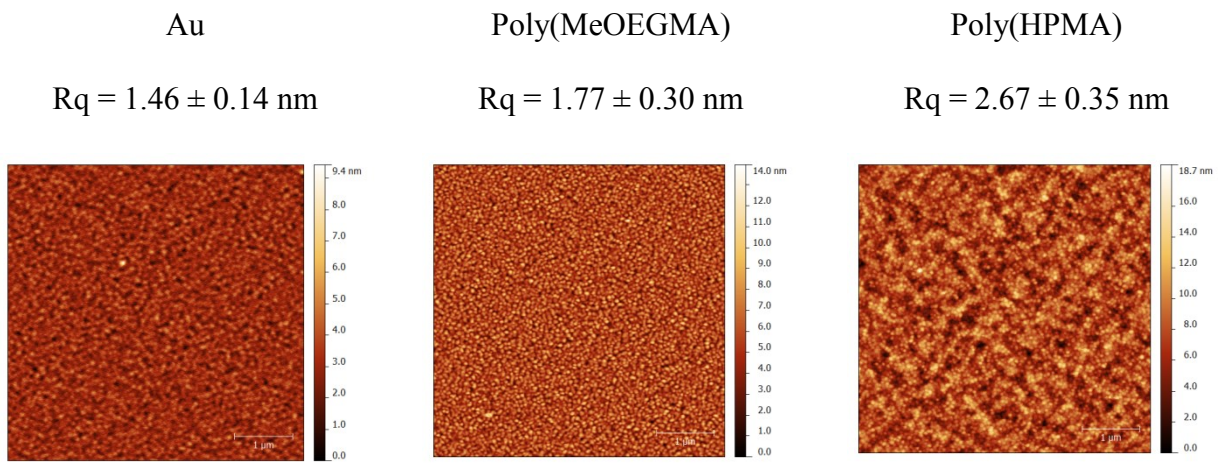

Fig. S7. Representative AFM topography images of the different types of polymer brushes grown from the surface of silicon chips. The root-mean-square roughness (Rq) is also reported. The scale bar is 1 µm.