Electronic supplementary information for:

A novel Y-shaped photoiniferter used for the construction of polydimethylsiloxane surfaces with antibacterial and antifouling properties

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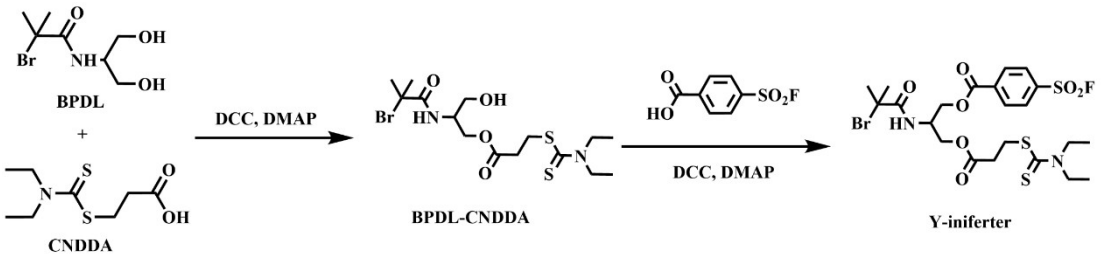
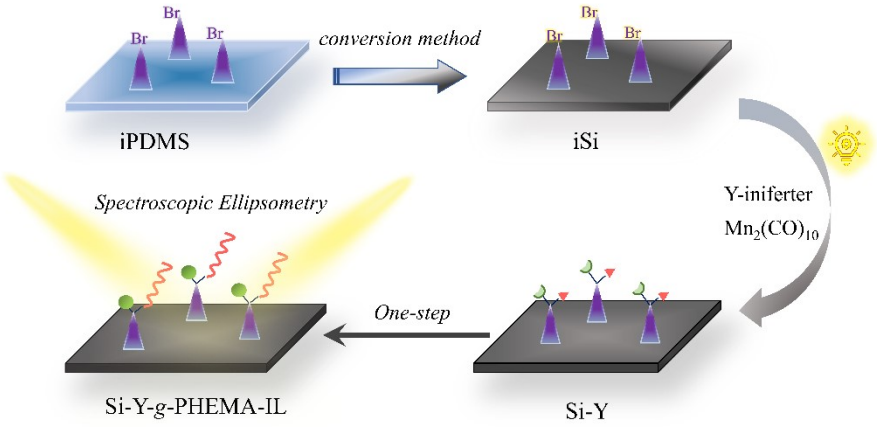


Scheme S1. Synthetic route of Y-iniferter.



Scheme S2. A conversion method was used to substitute iPDMS with Si wafers (iSi) that also possessed *tert*-butyl bromide initiation sites on the surface. Then Si-Y with Y-iniferter immobilized on the surface and Si-Y-*g*-PHEMA-IL with polymer brushes grafted on the surface were prepared by successively using the same strategy as iPDMS-Y; the thickness of the grafted layers was measured by ellipsometry.

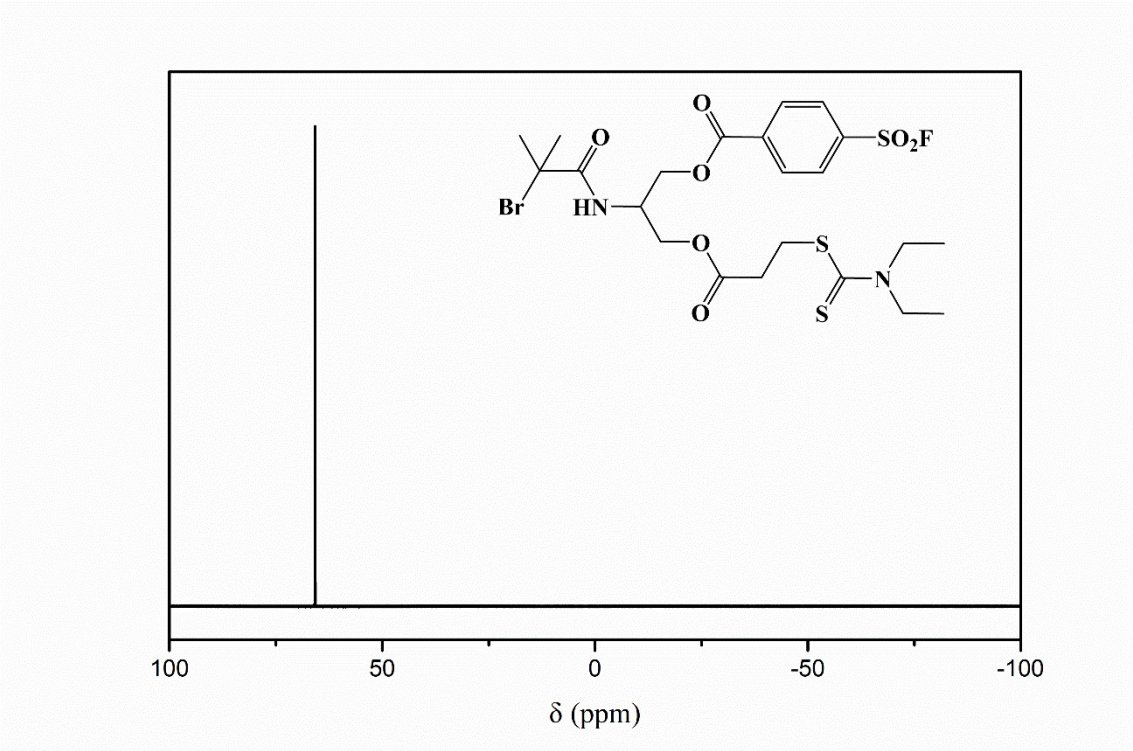


Figure S1. ^{19}F NMR spectrum of Y-iniferter in $CDCl_3$.

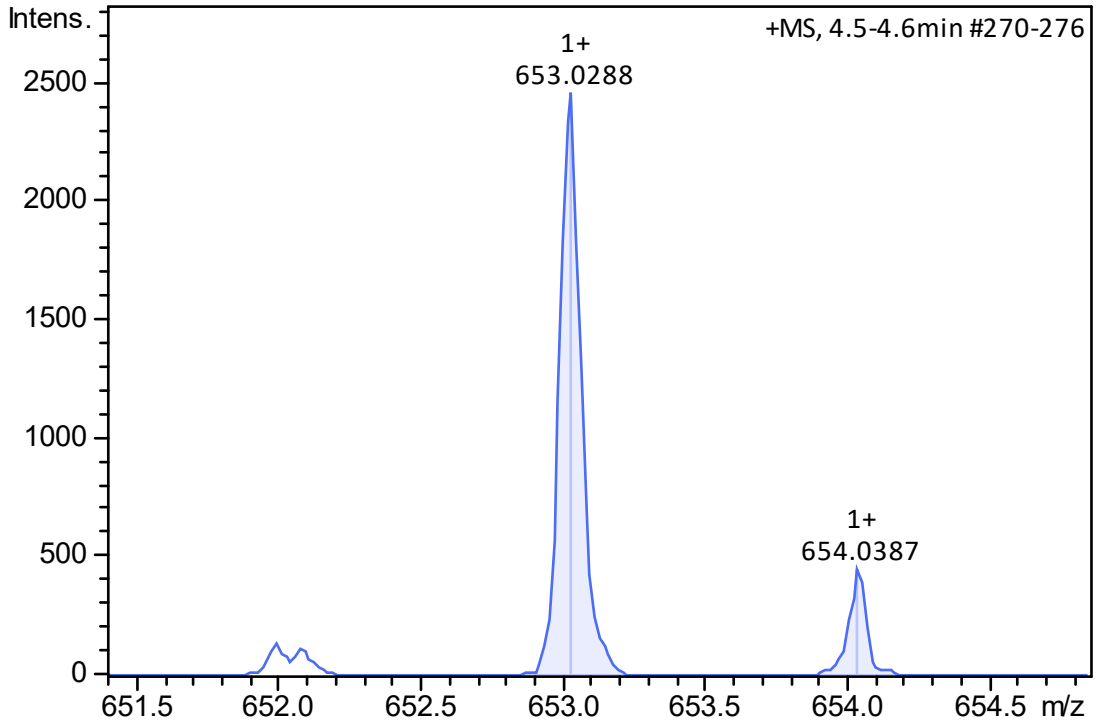


Figure S2. MS spectrum of Y-iniferter in methanol (calculated for M + Na^+: m/z=653.0255).

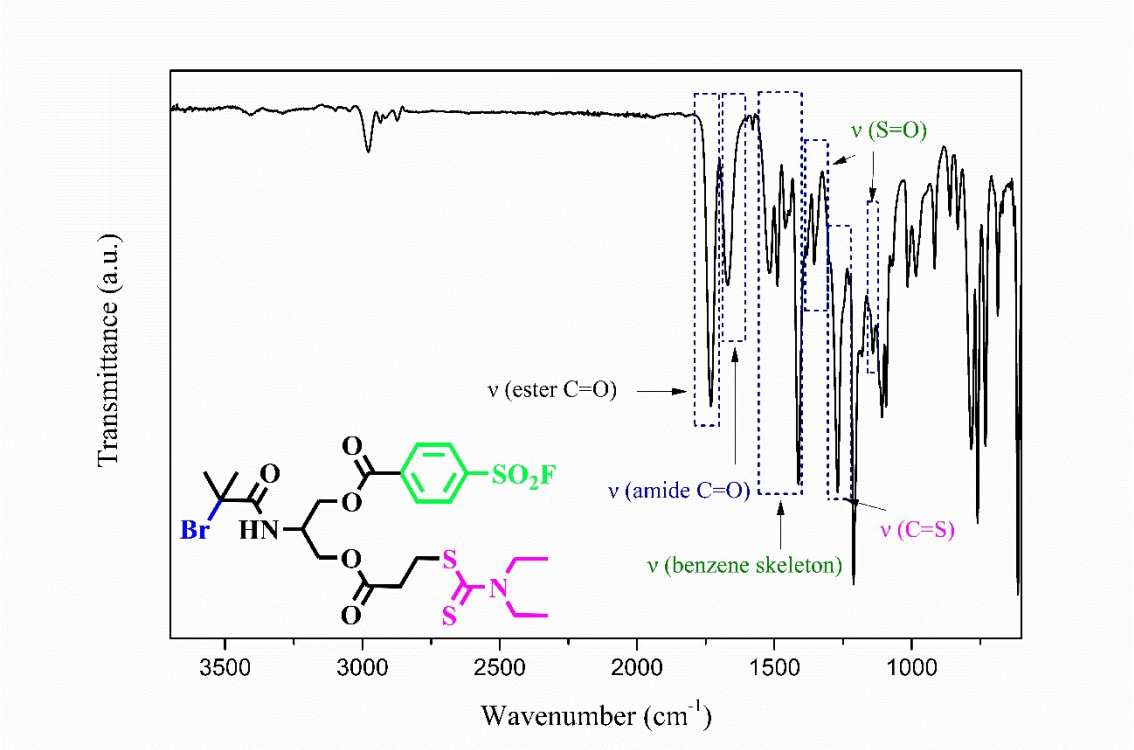


Figure S3. FT-IR spectrum of Y-iniferter.

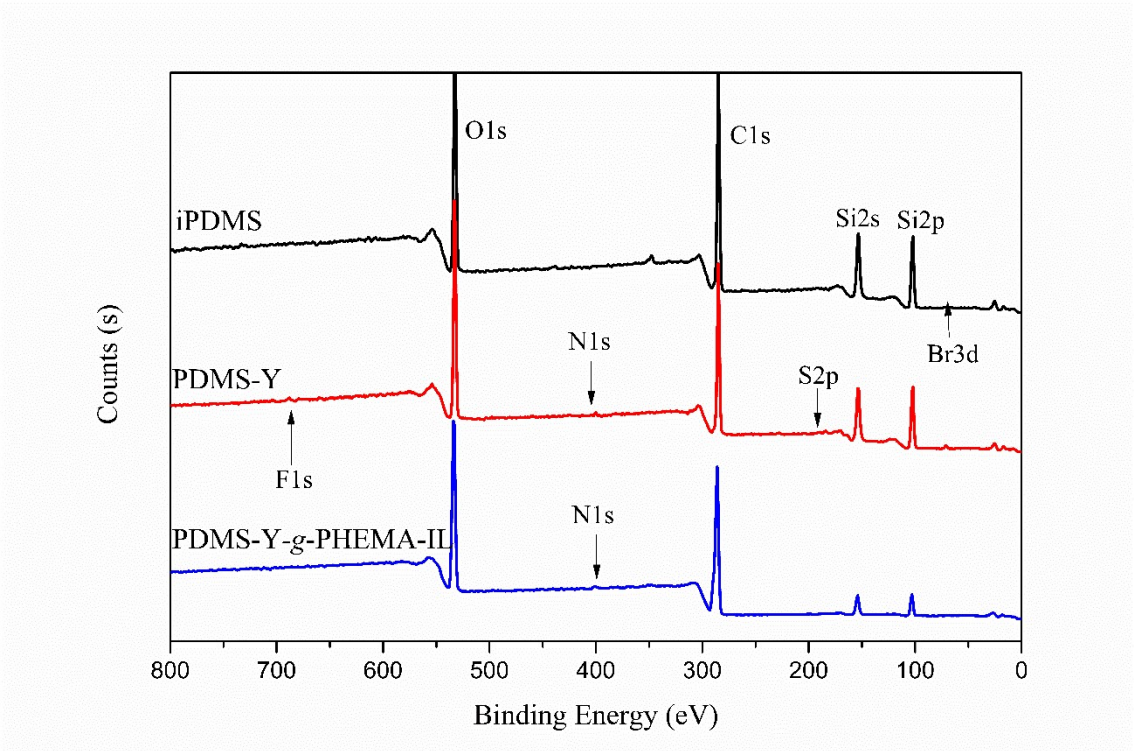
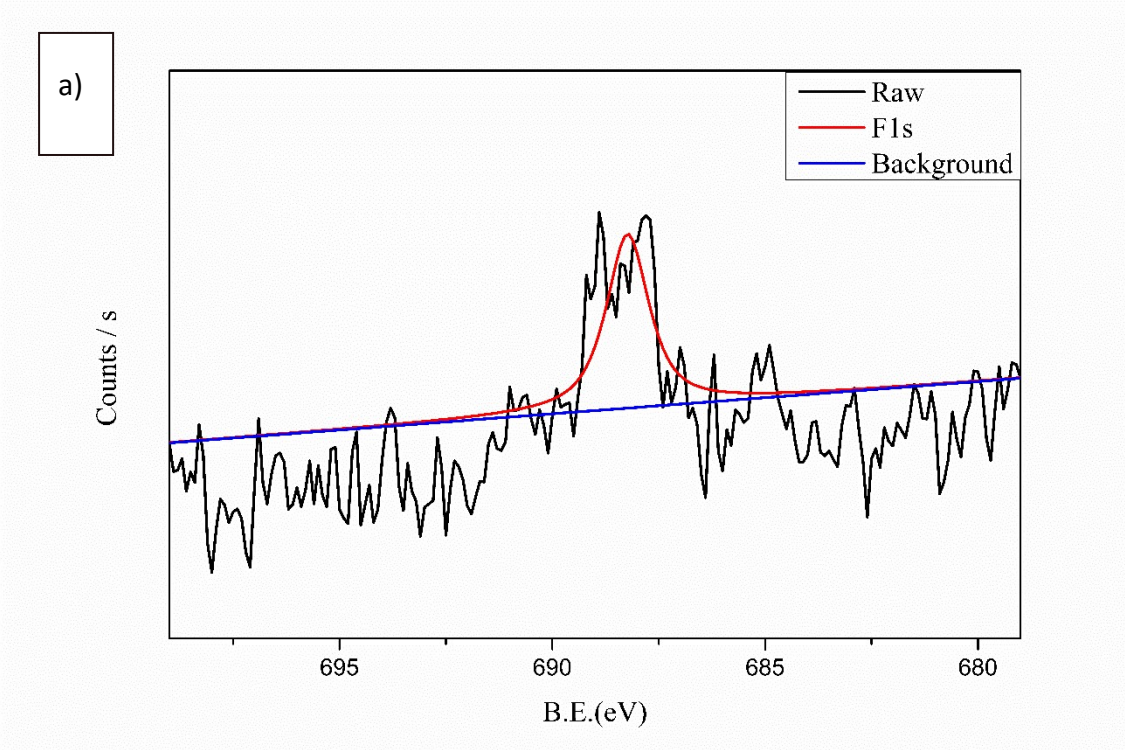
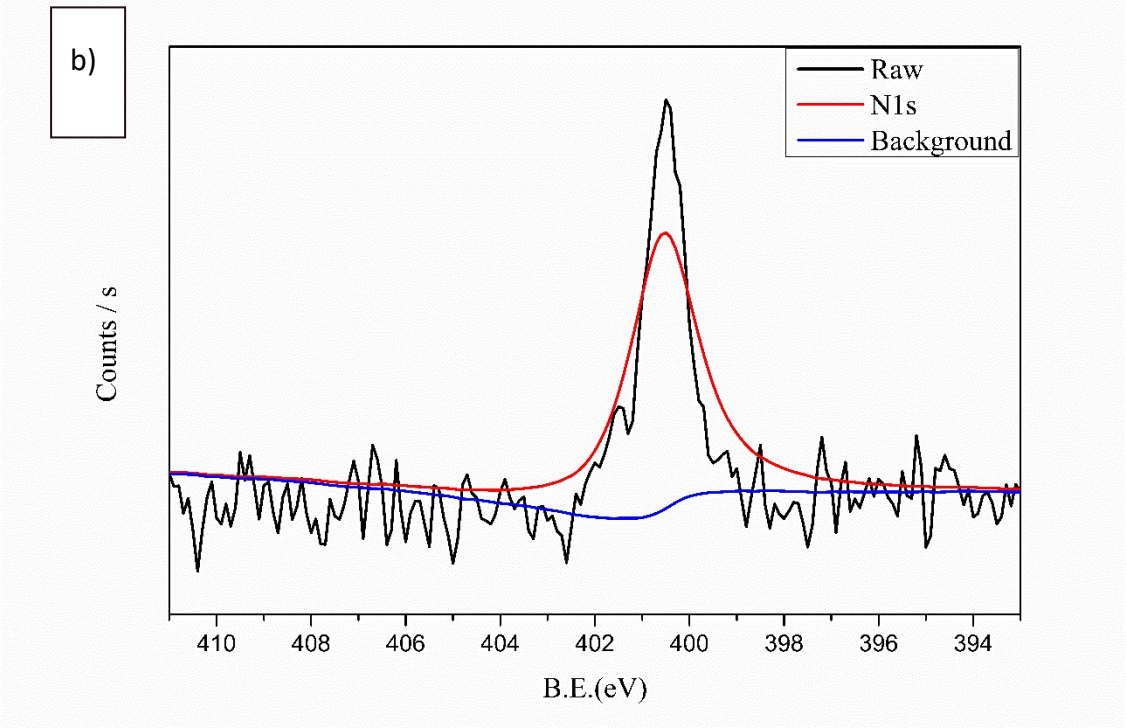


Figure S4. XPS survey spectra of iPDMS, PDMS-Y, and PDMS-Y-*g*-PHEMA-IL surfaces.


a)
Raw
F1s
Background
Counts / s
695
690
685
680
B.E.(eV)


b)
Raw
N1s
Background
Counts / s
410
408
406
404
402
400
398
396
394
B.E.(eV)

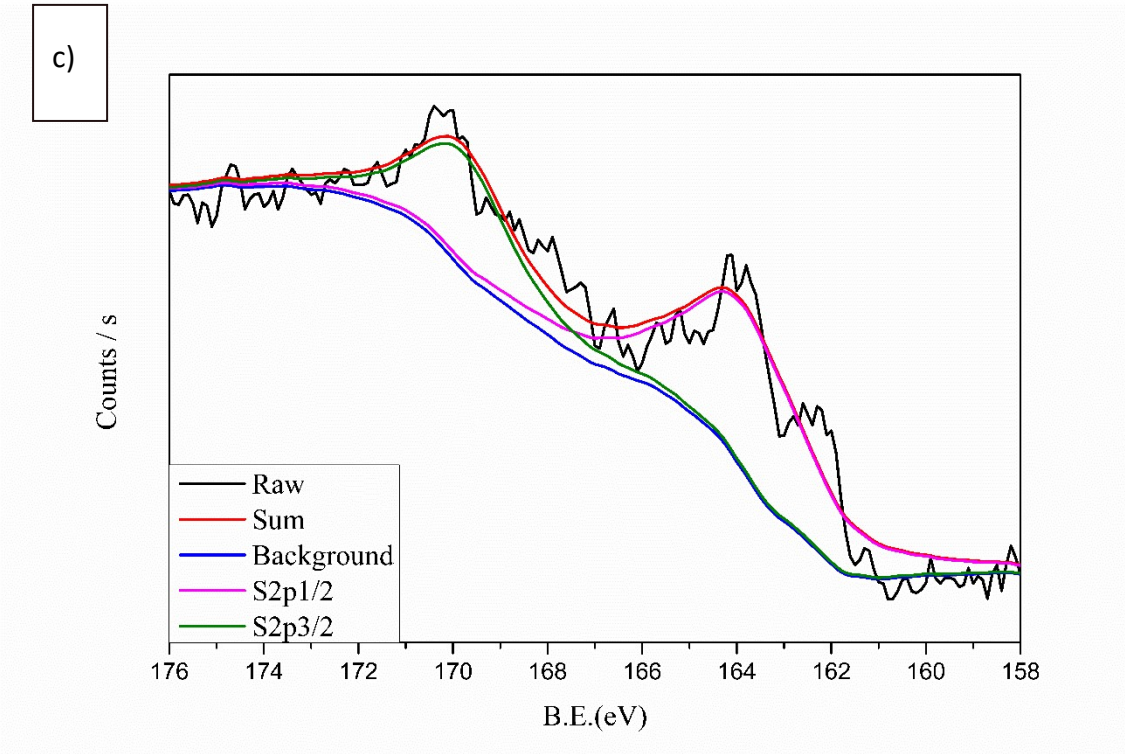


Figure S5. XPS high-resolution spectra of a) F (1s 688.23eV); b) N (1s 400.56eV); c) S (2p1/2 163.79eV, 2p3/2 169.79eV) on PDMS-Y surface.

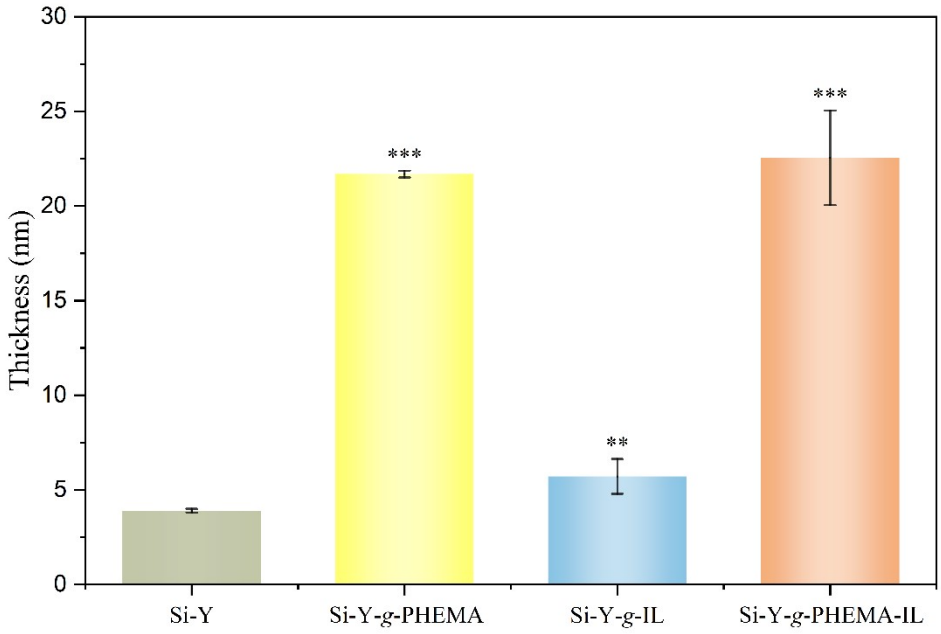


Figure S6. Ellipsometry thickness of the grafted layer on the modified Si wafers. The

data are presented as mean ± standard deviation (*n = 3*). *, **, and *** respectively indicate p > 0.05, 0.01 < p < 0.05, and p < 0.01 (calculated by student's t-test), where the asterisks on the error bars represent the comparison of the samples with the control group (Si-Y).

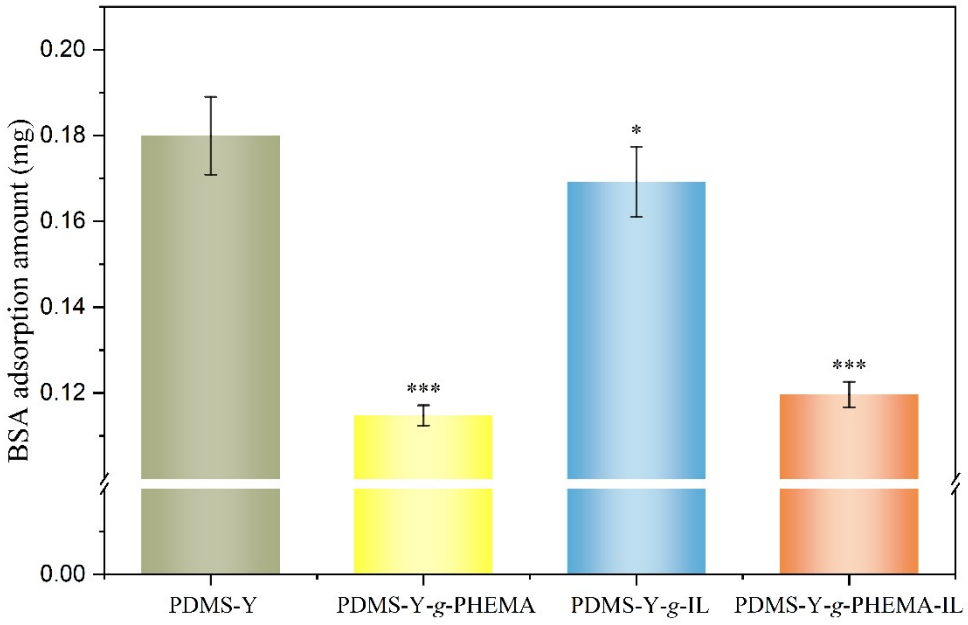


Figure S7. The amount of Bovine Serum Albumin (BSA) adsorbed on each slice of PDMS-Y, PDMS-Y-*g*-PHEMA, PDMS-Y-*g*-IL, and PDMS-Y-*g*-PHEMA-IL surface. The data are presented as mean ± standard deviation (*n = 3*). *, **, and *** respectively indicate p > 0.05, 0.01 < p < 0.05, and p < 0.01 (calculated by student's t-test), where the asterisks on the error bars represent the comparison of the samples with the control group (PDMS-Y).

Table S1. Element mapping on the surface of various samples as measured by SEM-EDS. The figures are all at a scale of 25 microns.

Samples / Element mapping	iPDMS	PDMS-Y	PDMS-Y-*g*-PHEMA-IL

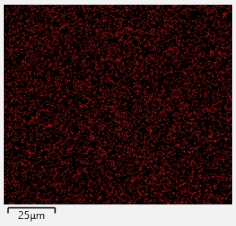
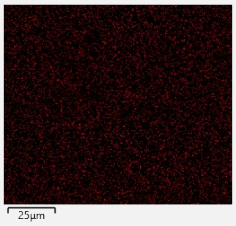
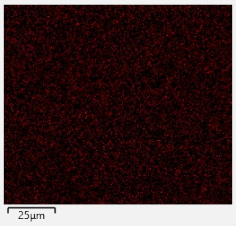
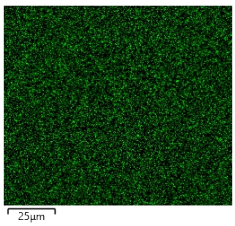
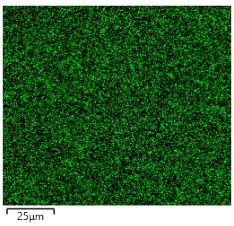
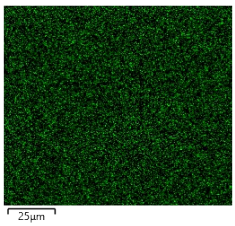
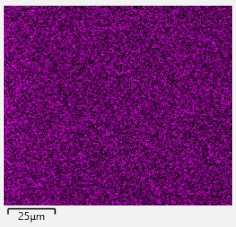
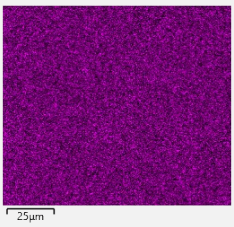
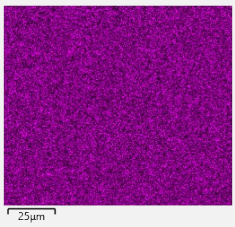
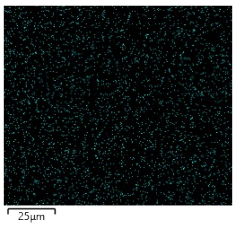
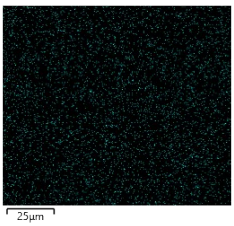
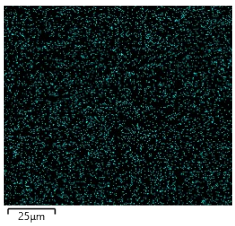
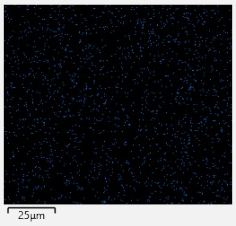
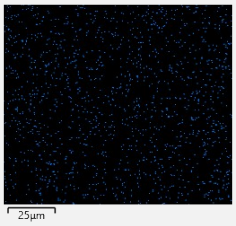
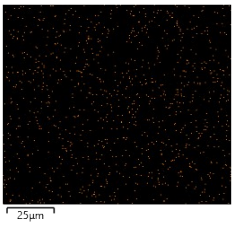
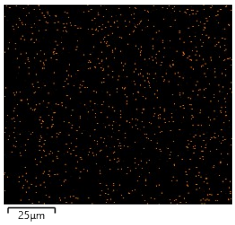
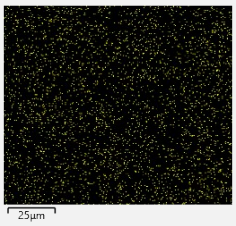
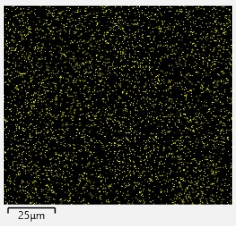
C			
O			
Si			
Br			
F	-		
N	-		
S	-		

Table S2. The weight percentage of elemental content on each sample surface as measured by EDS.

Samples	Wt% of element						
	C	O	Si	Br	F	N	S
iPDMS	38.95	41.30	19.30	0.44	-	-	-
PDMS-Y	38.92	33.03	27.06	0.27	0.13	0.46	0.13
PDMS-Y-*g*-PHEMA-IL	49.81	26.35	22.95	0.33	0.14	0.40	0.03

Table S3. Calculated positive charge density of various samples. Data were shown as the mean ± standard deviation (*n=3*). *, **, and *** respectively indicate $p > 0.05$, $0.01 < p < 0.05$, and $p < 0.01$ (calculated by student's t-test) compared with the control group (PDMS-Y).

Samples	Surface Positive Charge Density ($N^+ \times 10^{14}/cm^{-2}$)	p
PDMS-Y	0 ± 0.035	-
PDMS-Y-*g*-PHEMA	0.229 ± 0.021	**
PDMS-Y-*g*-IL	27.987 ± 2.236	***
PDMS-Y-*g*-PHEMA-IL	22.834 ± 2.305	***