

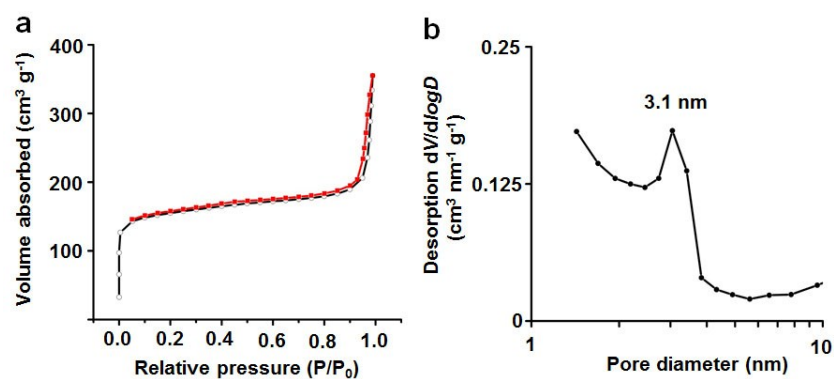


Figure S1. (a) The nitrogen adsorption-desorption isotherm and (b) pore-size distribution of mesoporous carbon particles.

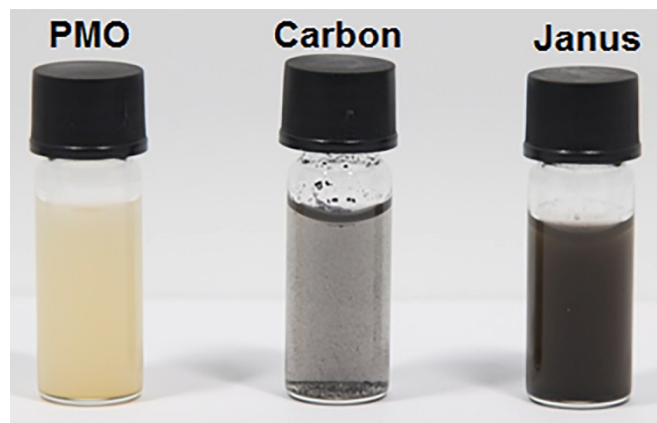


Figure S2. Digital images of PMO, carbon and Janus particles dispersed in water at room temperature.

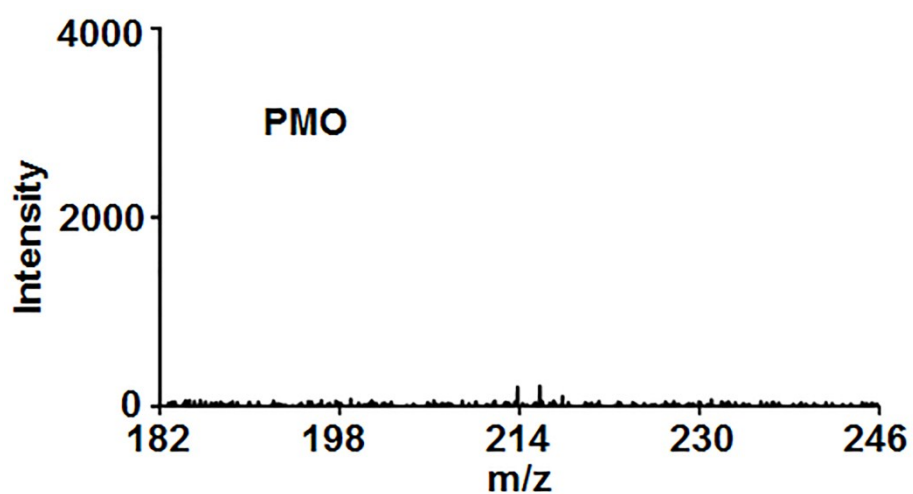


Figure S3. LDI MS analysis of the mixture with 10 ng μL^{-1} glucose, tryptophan, arginine, and phenylalanine in the positive ion mode using PMO as matrix.

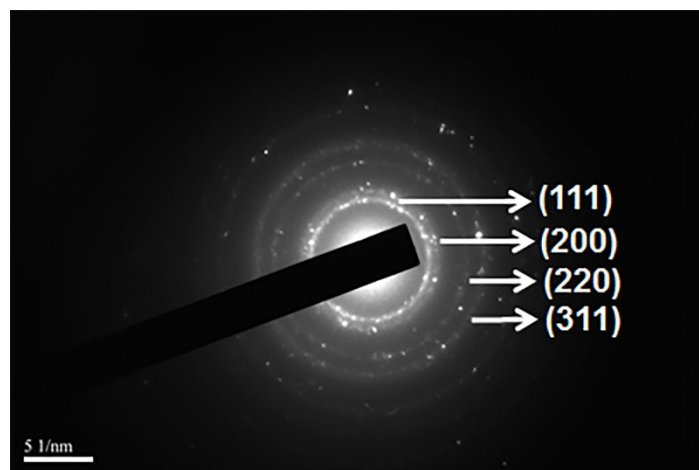


Figure S4. SAED pattern showing silver crystal lattice.

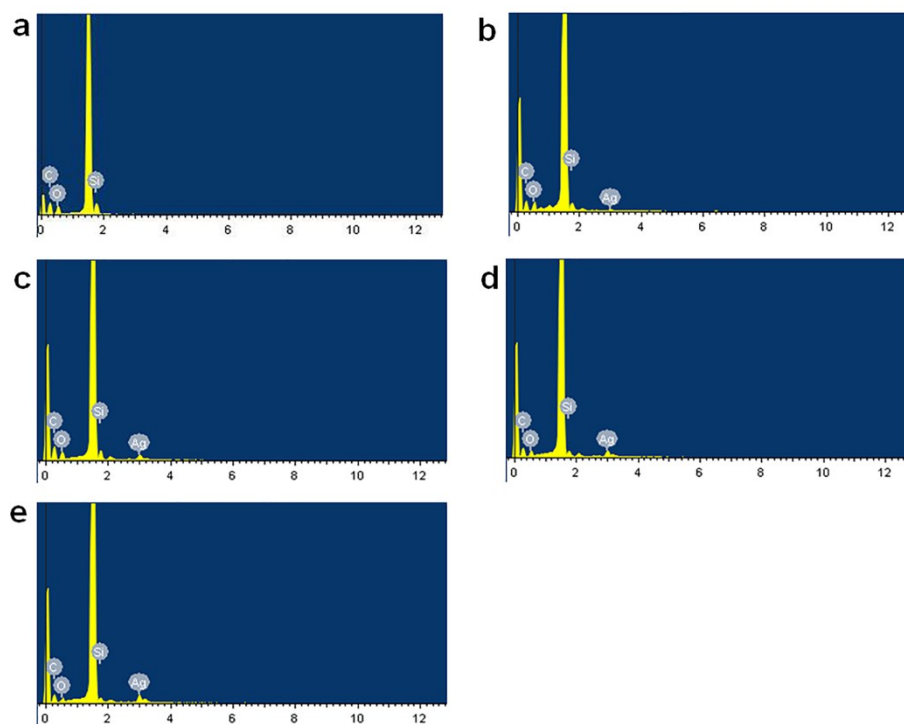


Figure S5. Typical EDX spectra of materials. (a) Janus, (b) Janus@Ag-0.5, (c) Janus@Ag-1, (d) Janus@Ag-3, and (e) Janus@Ag-5 particles.

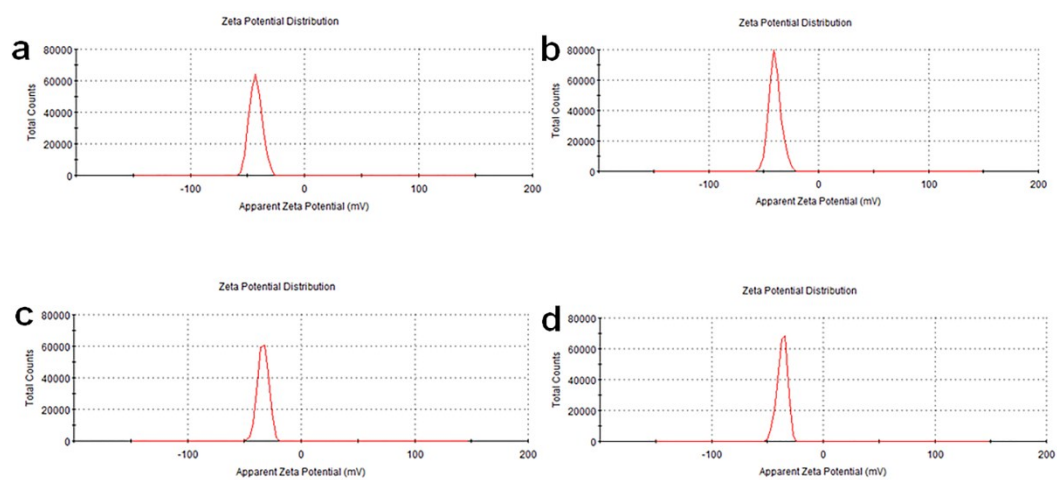


Figure S6. Typical zeta potential distributions of materials. (a) Janus@Ag-0.5, (b) Janus@Ag-1, (c) Janus@Ag-3, and (d) Janus@Ag-5 particles.

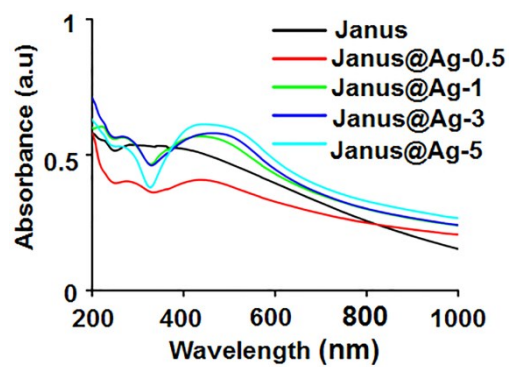


Figure S7. UV-Vis absorption spectra of Janus and Janus@Ag particles.

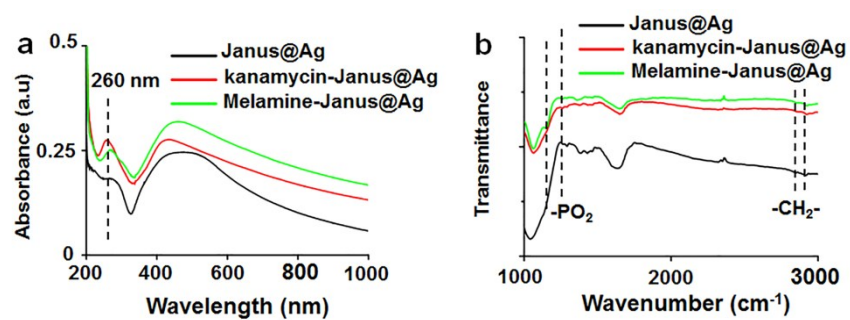


Figure S8. Surface modification of Janus@Ag particles. (a) FTIR spectra and (b) UV-Vis absorption spectra of Janus@Ag and aptamers modified Janus@Ag particles.

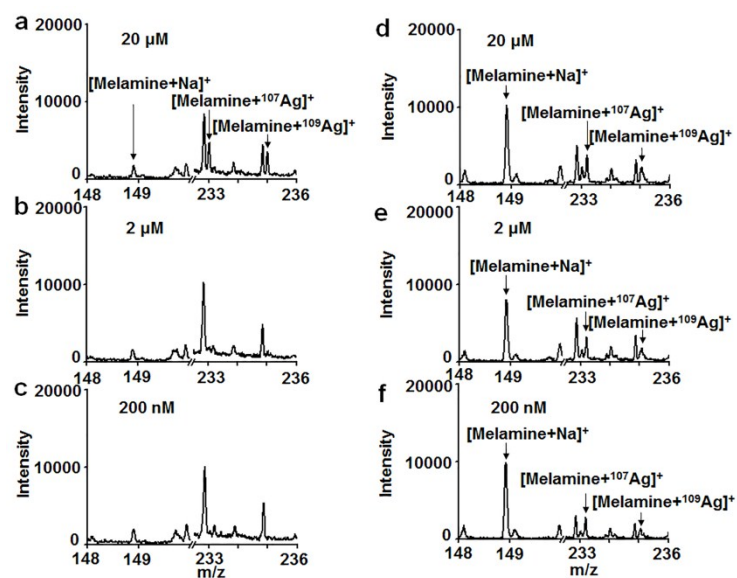


Figure S9. Mass spectra of melamine using Janus@Ag-3 as matrix at (a) 20 μ M, (b) 2 μ M, and (c) 200 nM, and using aptamer-Janus@Ag-3 for enrichment and LDI MS detection at (d) 20 μ M, (e) 2 μ M, and (f) 200 nM.

Table S1 m/z values of characteristic molecular peaks of typical metabolites by LDI MS.

Small molecules	m/z [M+Na] ⁺	m/z [M+K] ⁺
Phenylalanine	188.10	204.08
Arginine	197.13	213.11
Glucose	203.09	219.07
Tryptophan	227.11	243.09

Table S2 Elementary composition analysis of Janus and Janus@Ag particles.

Samples	Weight (%)				Atomic (%)			
	C	O	Si	Ag	C	O	Si	Ag
Janus	51.82	34.12	14.06	0	62.10	30.70	7.21	0
Janus@Ag-0.5	46.18	37.47	12.26	4.10	57.72	35.16	6.55	0.57
Janus@Ag-1	44.29	32.92	10.37	12.42	59.19	33.03	5.93	1.85
Janus@Ag-3	36.86	31.70	9.44	22.00	54.90	35.44	6.01	3.65
Janus@Ag-5	35.31	27.56	8.97	28.15	56.07	32.85	6.09	4.98

Table S3 Zeta potential distributions of materials.

Materials	Zeta Potential (mV)
Janus@Ag-0.5	-40.53±1.79
Janus@Ag-1	-40.20±1.68
Janus@Ag-3	-36.13±0.55
Janus@Ag-5	-33.4±2.25