

## Supporting information

# **pH and molecular weight dependence of auric acid reduction by polyethylenimine and the gene transfection efficiency of the cationic gold nanoparticles thereof**

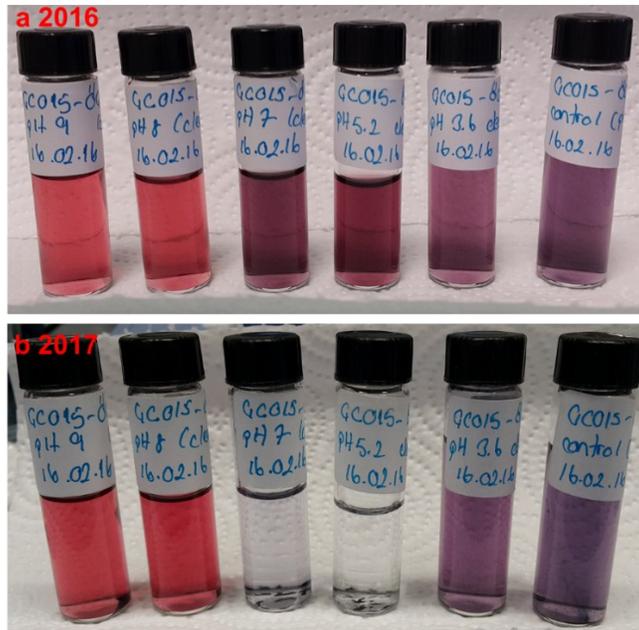
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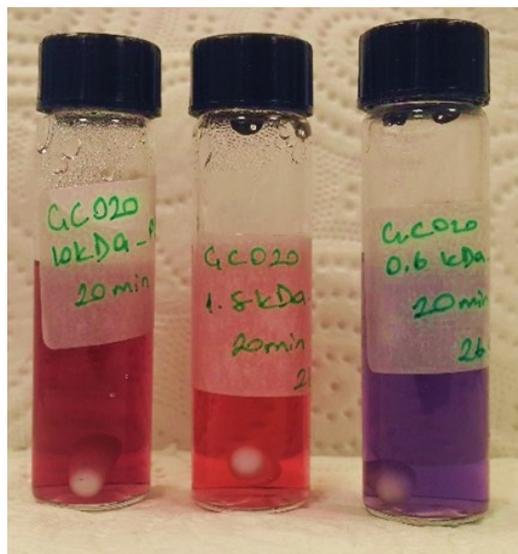
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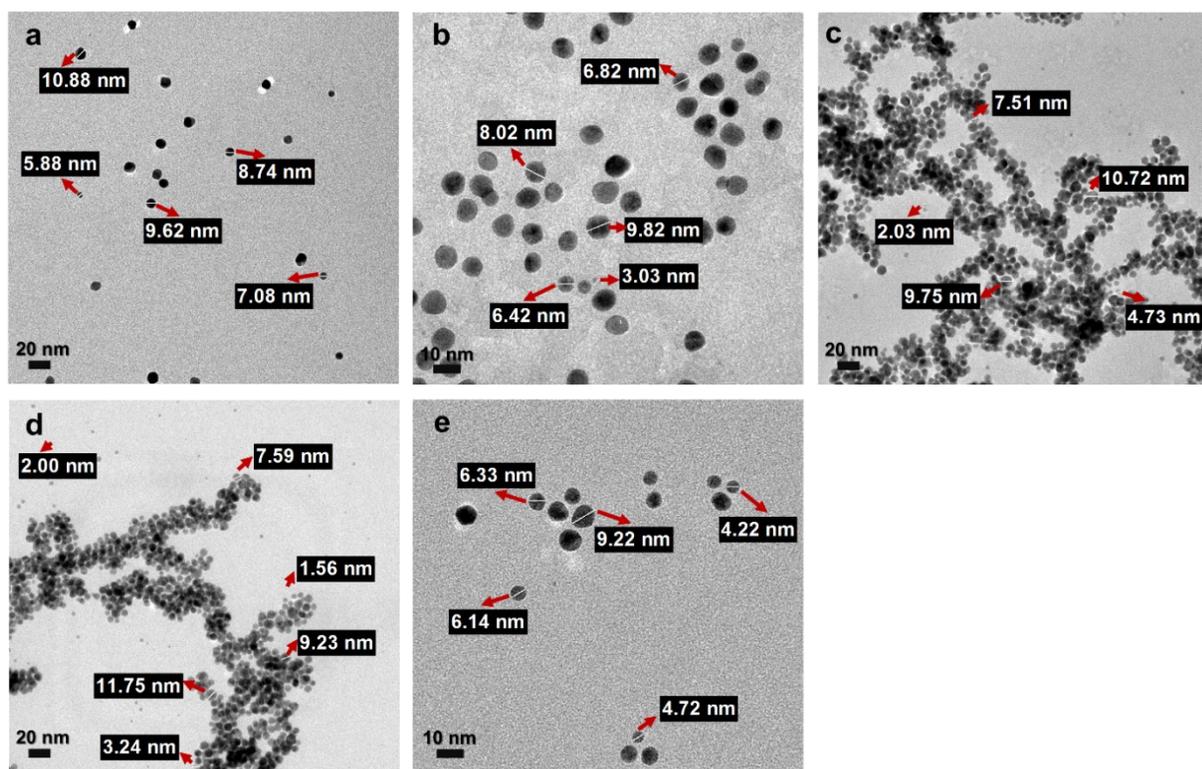
<sup>c</sup>Koc University, KUYTAM, Rumelifeneri Yolu, Sariyer 34450, Istanbul, Turkey.



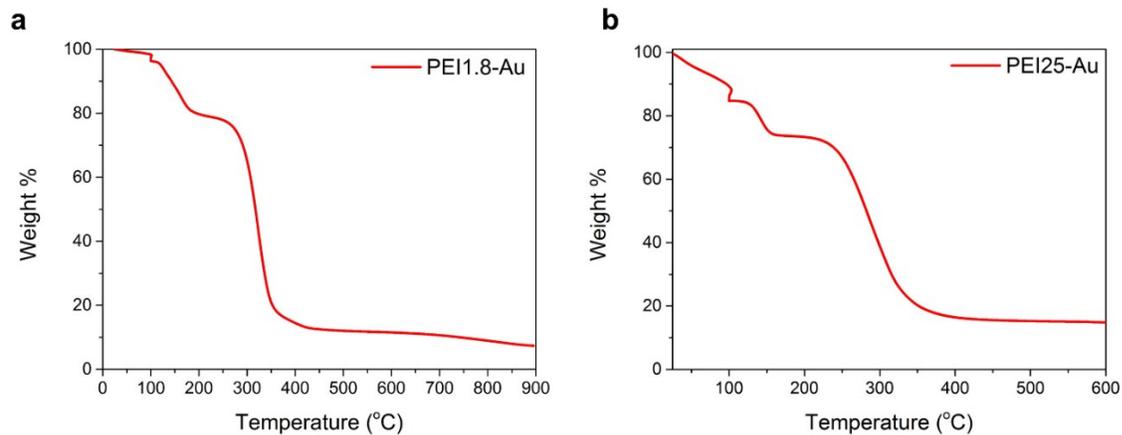
**Fig. S1** From left to right pictures of PEI25-Au synthesized at pH 9, 8, 7, 5.2, 3.6 and control (no pH adjustment) a) after being washed following the synthesis step and b) after 1 year storage at room temperature.



**Fig. S2** Pictures of PEI10-Au, PEI1.8-Au and PEI0.6-Au after synthesis (no pH adjustment).



**Fig. S3** TEM images of a) PEI1.8-Au, b) PEI1.8-Au synthesized at pH 9, c) PEI10-Au, d) PEI25-Au and e) PEI25-Au synthesized at pH 9.



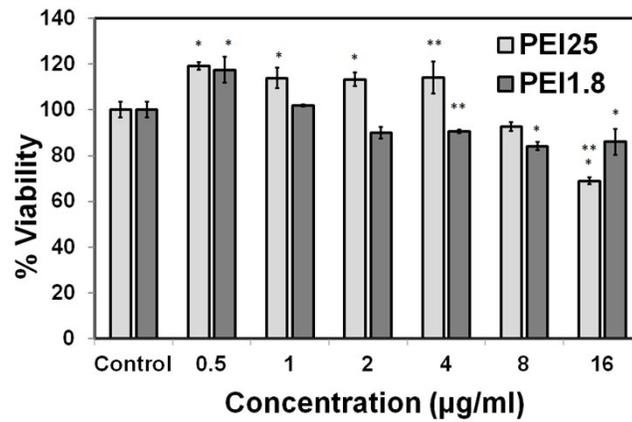
**Fig. S4** Thermal gravimetric analysis (TGA) of a) PEI1.8-Au synthesized at pH 9, b) PEI25-Au synthesized at pH 9. Weight loss at 100 °C is due to the water loss during the isothermal step.

**Table S1.** Binding energies of N1s, C1s and Au 4f core level in PEI25-Au synthesized at pH 9.5 and 3.5.

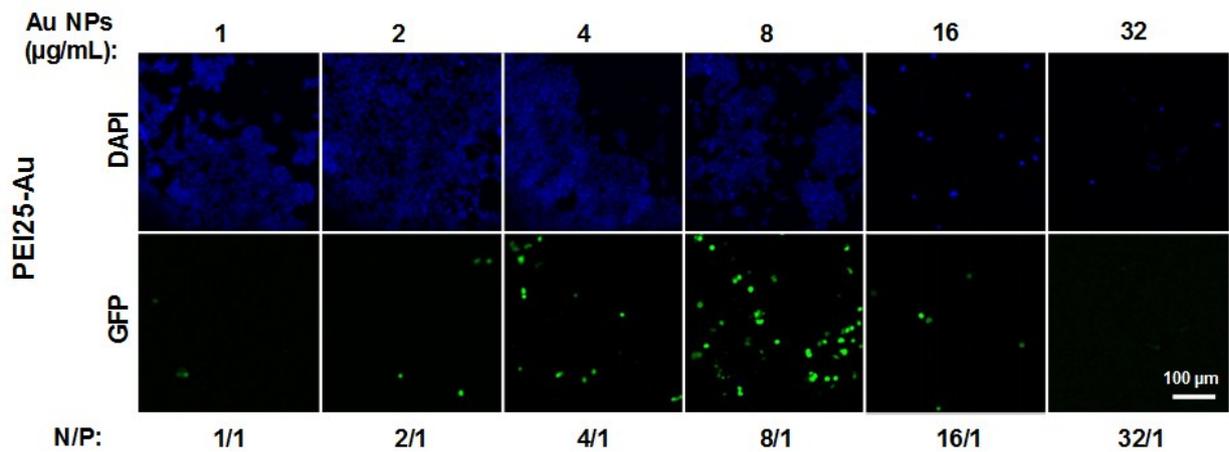
	Binding energies (eV)					
	N 1s		C 1s		Au 4f	
	Free amines	Bound and/or reduced amines	C-N	C=N	Au <sup>0</sup>	Au <sup>+</sup>
At pH 9.5	399.09	400.23	284.86	287.21	83.84	84.86
At pH 3.5	399.02	400.63	285.32	287.88	83.06	84.08

**Table S2.** Atomic ratio of C, N, Au in the PEI25-Au synthesized at different pH values

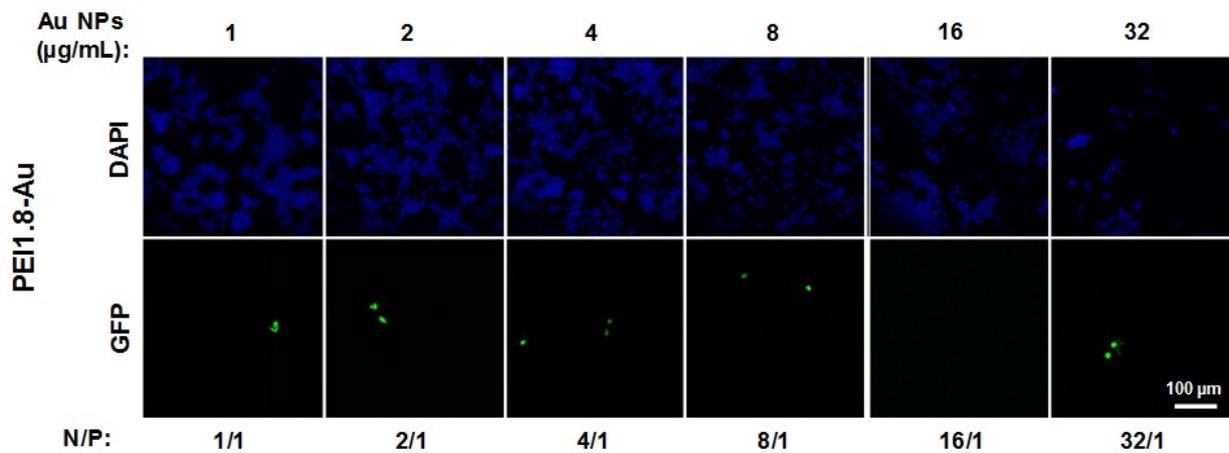
Atomic Ratio	pH 9.5	pH 3.5
$N_{\text{bound}}/N_{\text{tot}}$	0.64	0.09
$C=N/C_{\text{tot}}$	0.15	0.065
$Au^0/Au_{\text{tot}}$	0.80	0.71
N/Au	428	291
$N_{400}/Au_{83}$	342.50	40.60



**Fig. S5** Dose dependent viability of HEK293T cells treated with bPEI 25kDa and bPEI 1.8kDa as measured by MTT assay after 24 h incubation with the polymer. Each column represents the mean with error bars representing  $\pm$ SD ( $n=3$ ),  $p<0.05$ . \* shows statistically significant difference from the control, and \*\* shows statistically significant difference from the 8  $\mu$ g/ml dose.



**Fig. S6** Inverted fluorescence microscopy images of HEK 293T cells after 48 h post-transfection with pMax-GFP vector by PEI25-Au nanoparticles at different N/P ratios. pDNA was used at fixed concentration (2.33 µg/mL). Cell nuclei were stained with DAPI (blue color).



**Fig. S7** Inverted fluorescence microscopy images of HEK 293T cells after 48 h post-transfection with pMax-GFP vector by PEI1.8-Au nanoparticles at different N/P ratios. pDNA was used at fixed concentration (2.33 µg/mL). Blue color is DAPI staining showing cell nuclei.