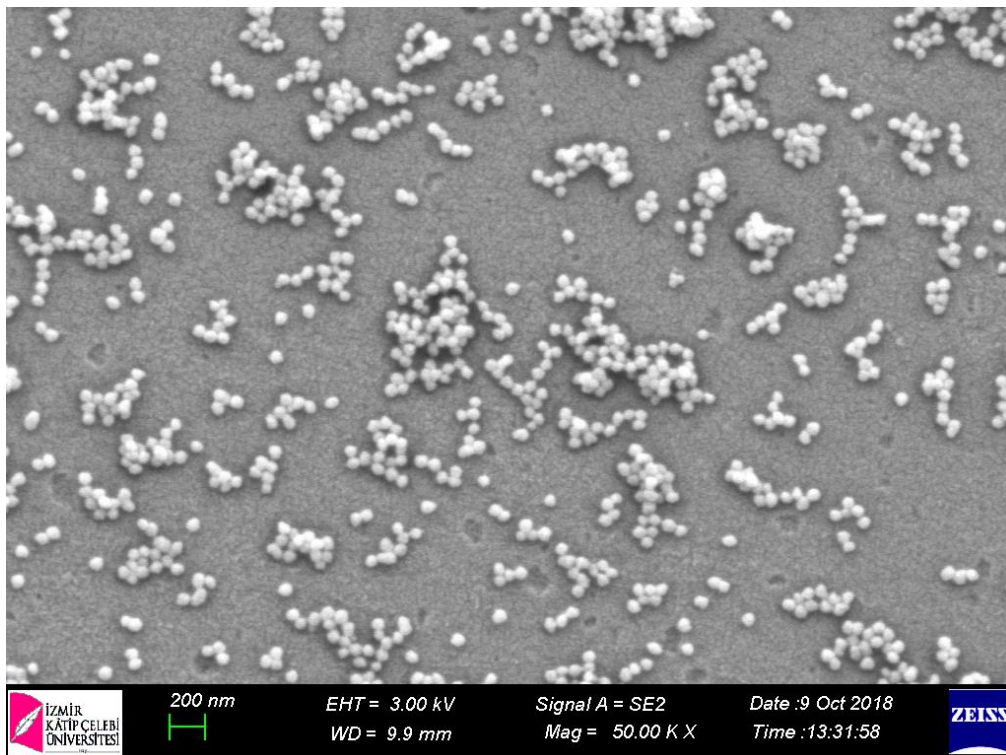
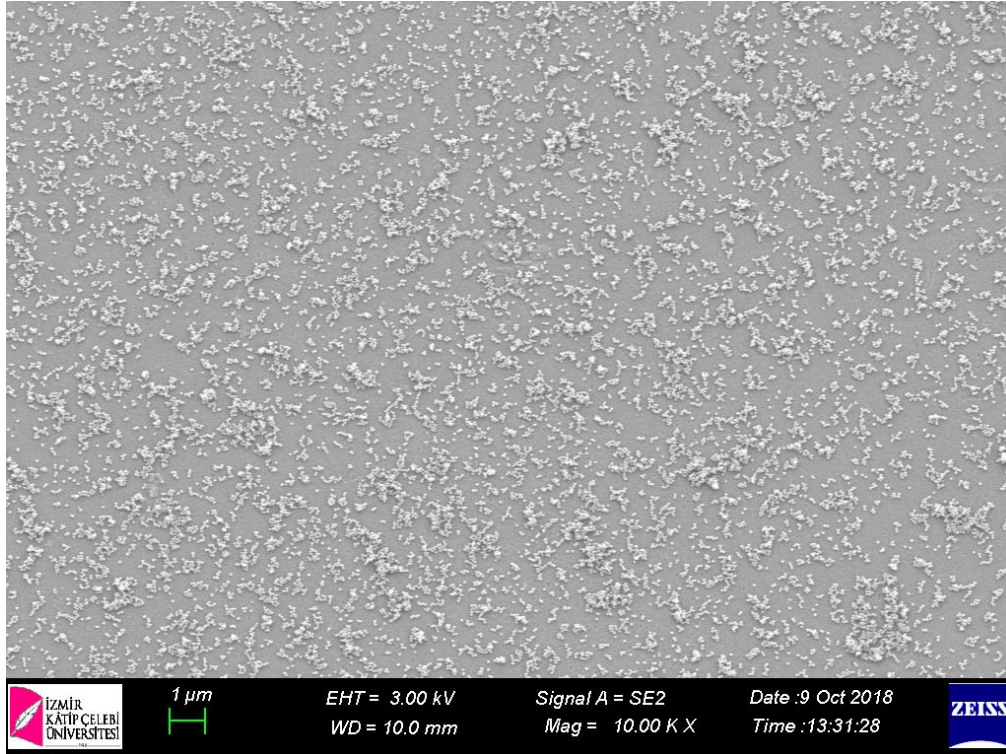


Supplementary Materials

A New Nanomaterial Based Biosensor for MUC1 Biomarker Detection in Early Diagnosis, Tumor Progression and Treatment of Cancer



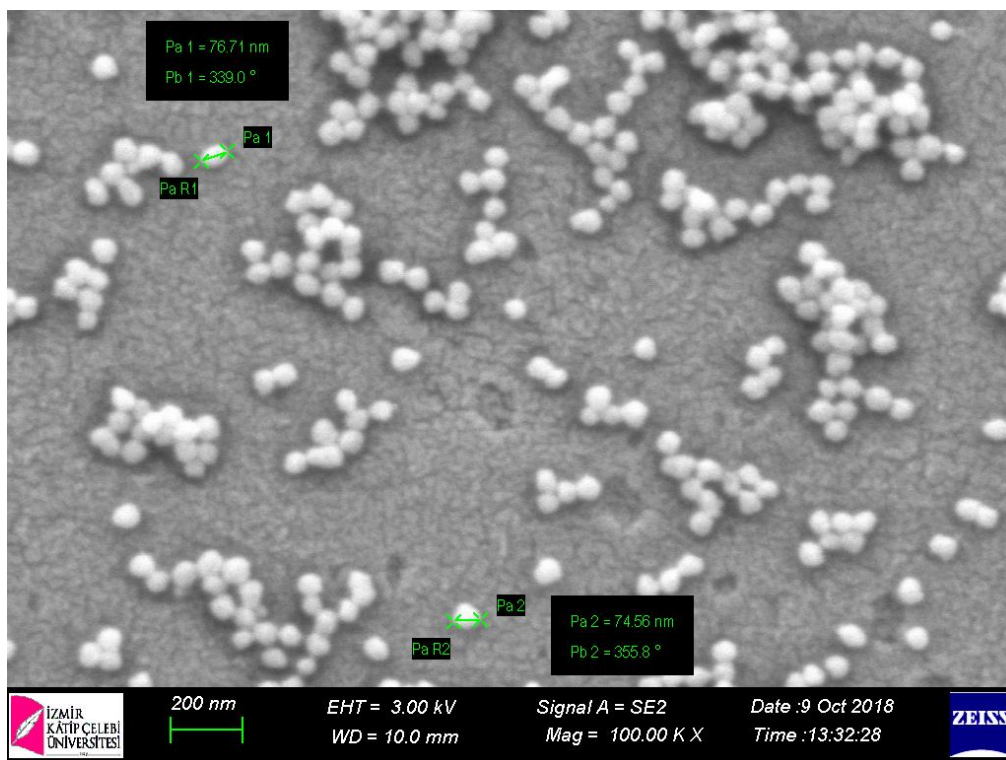
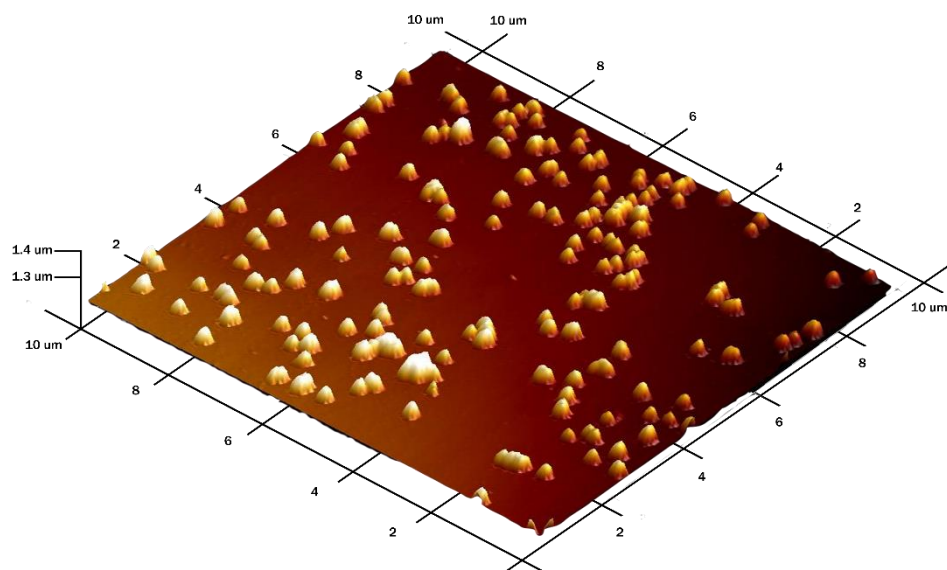


Figure S1. SEM images of p(HEMA)-IMEO-ConA nanoparticles (10kx, 50kx, 100kx).

A



B

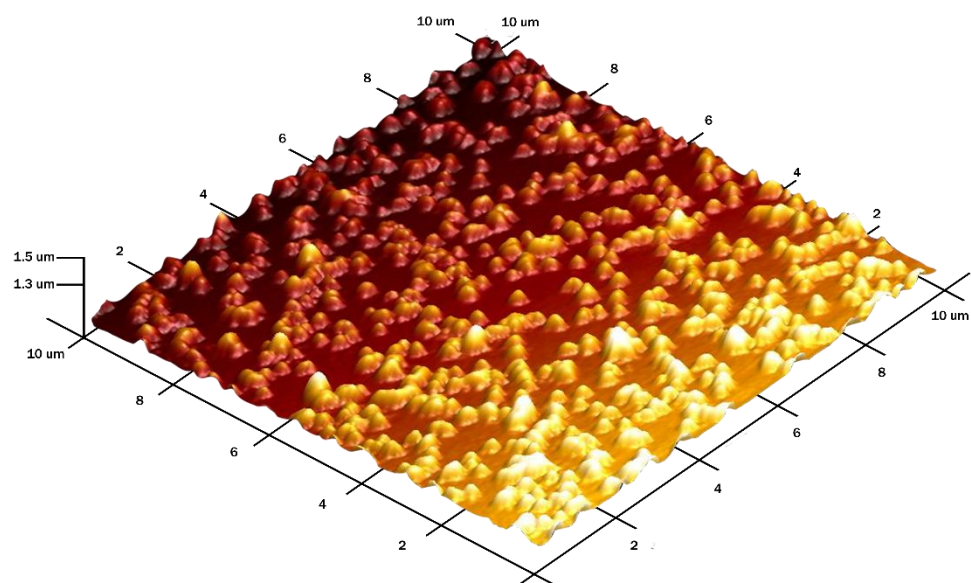


Figure S2. AFM images of (A) p(HEMA) and (B) p(HEMA)-IMEO nanoparticles.

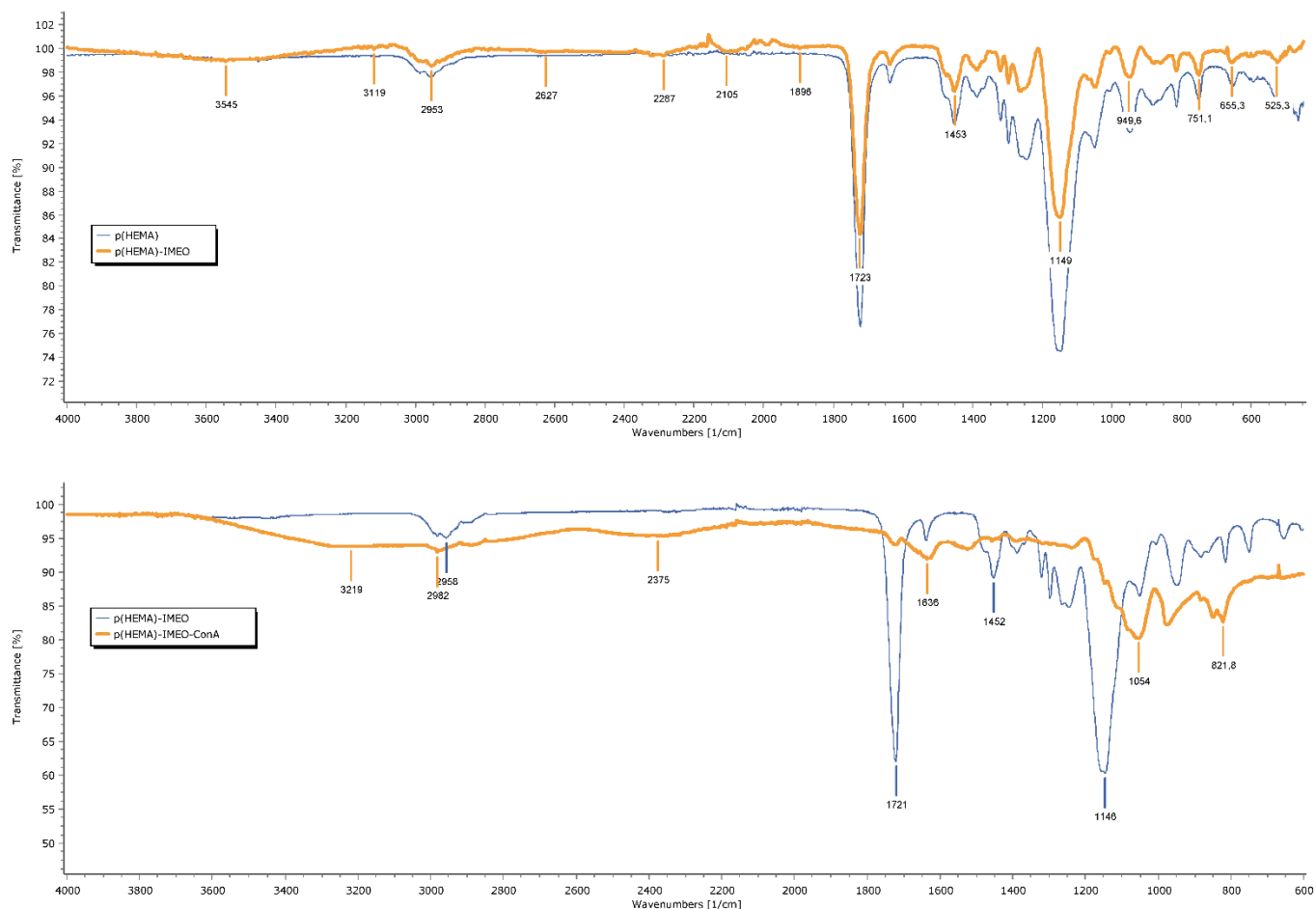
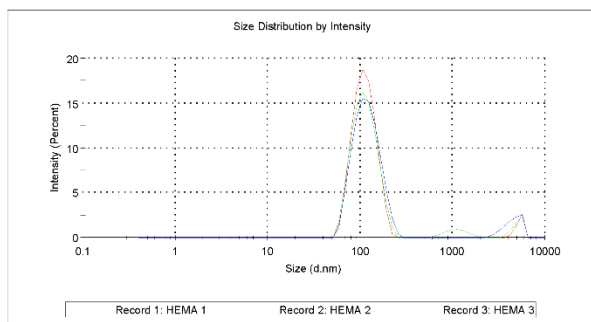


Figure S3. FTIR spectrum analysis of p(HEMA), p(HEMA)-IMEO and p(HEMA)-IMEO-ConA.

A Results

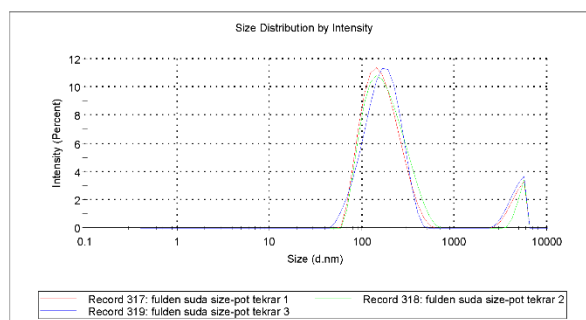
		% Intensity:	St Dev (d.n...
Z-Average (d.nm): 126.4	Peak 1: 120.0	90.7	38.13
Pdl: 0.293	Peak 2: 4457	9.3	897.8
Intercept: 0.948	Peak 3: 0.000	0.0	0.000
Result quality Good			



B

Results

		% Intensity:	St Dev (d.n...
Z-Average (d.nm): 181.7	Peak 1: 176.4	88.6	74.07
Pdl: 0.426	Peak 2: 4628	11.4	817.3
Intercept: 0.932	Peak 3: 0.000	0.0	0.000
Result quality Good			

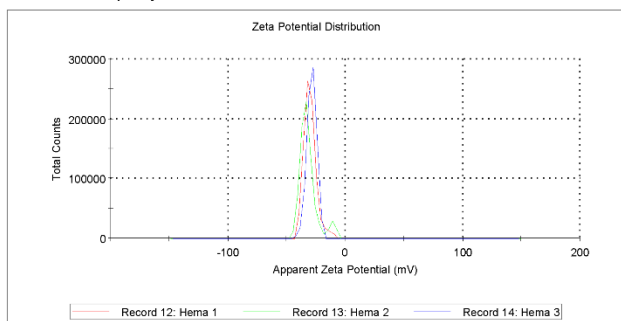


Polymer	p(HEMA)	p(HEMA)-IMEO-ConA
Average size (nm)	125.86	184.3
PDI	0.303	0.375

Figure S4. Zeta size results of (A) p(HEMA) and (B) p(HEMA)-IMEO-ConA nanoparticles.

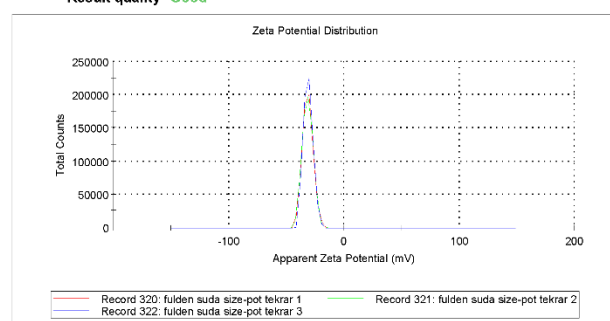
A Results

	Mean (mV)	Area (%)	St Dev (mV)
Zeta Potential (mV): -28.6	Peak 1: -28.6	100.0	4.12
Zeta Deviation (mV): 4.12	Peak 2: 0.00	0.0	0.00
Conductivity (mS/cm): 0.00544	Peak 3: 0.00	0.0	0.00
Result quality Good			



B Results

	Mean (mV)	Area (%)	St Dev (mV)
Zeta Potential (mV): -31.0	Peak 1: -31.0	100.0	4.06
Zeta Deviation (mV): 4.06	Peak 2: 0.00	0.0	0.00
Conductivity (mS/cm): 0.0319	Peak 3: 0.00	0.0	0.00
Result quality Good			



Repeat	p(HEMA)	p(HEMA)-IMEO-ConA
1	-30	-31.4
2	-31.6	-31.4
3	-28.6	-31
Average	-30.06	-31.27
Standart deviation	1.22	0.18

Figure S5. Zeta potential results of (A) p(HEMA) and (B) p(HEMA)-IMEO-ConA nanoparticles.

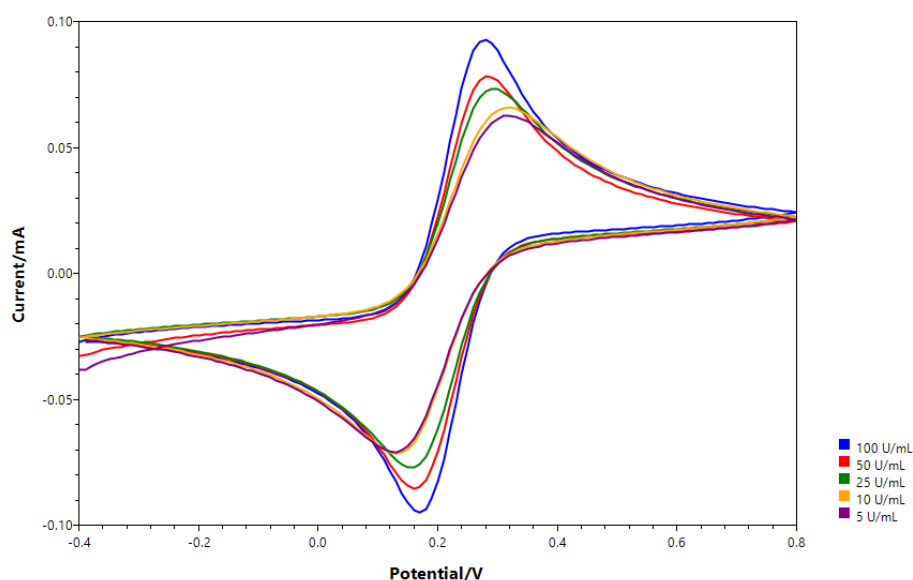


Figure 6. CV analysis of p(HEMA)-IMEO-ConA with different MUC1 concentrations (5 μ L p(HEMA)-IMEO-ConA nanopolymer, 25 $^{\circ}$ C, 90 min, different concentration of MUC1, 25 $^{\circ}$ C, 20 min).

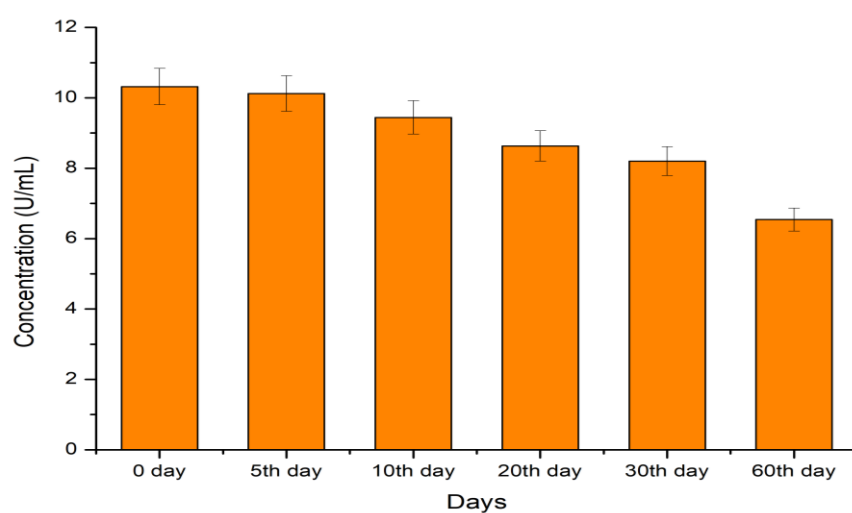


Figure S7. Storage stability results (5 μ L p(HEMA)-IMEO-ConA nanopolymer, 25°C, 90 min, 10 U/mL MUC1, 25°C, 20 min).

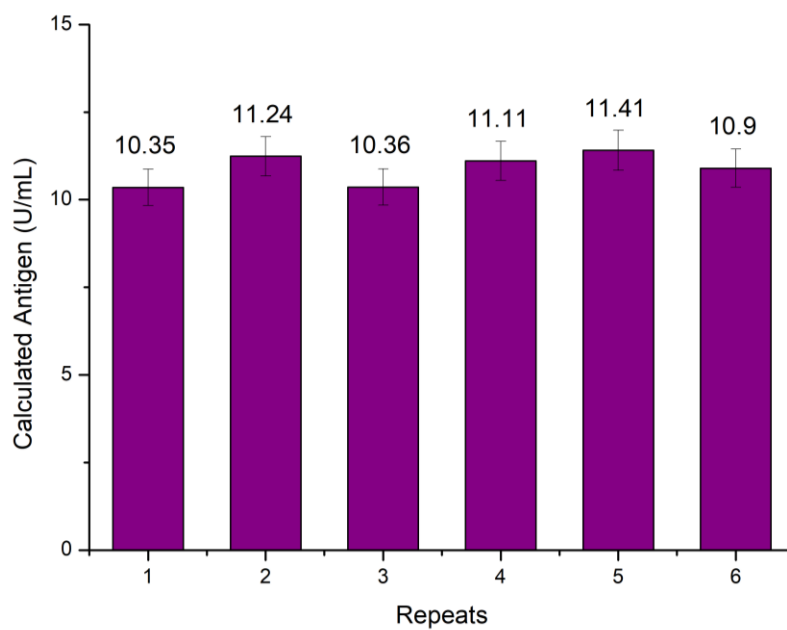


Figure 8. Reproducibility results (5 μ L p(HEMA)-IMEO-ConA nanopolymer, 25 °C, 90 min, 10 U/mL MUC1 + 1 mM MnCl₂, 1 mM CaCl₂ ion mixture, 25 °C, 20 min).

Descriptive Statistics

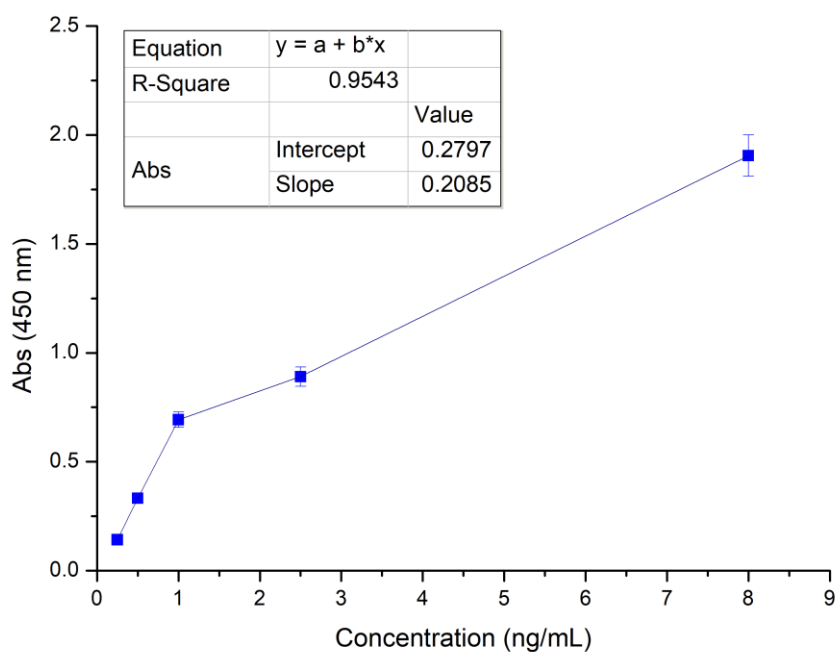
Mean: 10.8950
 SD: 0.4503
 # of values: 6
 Outlier detected? No
 Significance level: 0.05 (two-sided)
 Critical value of Z: 1.8871466793

Your data

Row	Value	Z	Significant Outlier?
1	10.35	1.2104	Furthest from the rest, but not a significant outlier ($P > 0.05$).
2	11.24	0.7662	
3	10.36	1.1882	
4	11.11	0.4775	
5	11.41	1.1437	
6	10.90	0.0111	

Figure 9. Grubb test results from Graphpad Online tool.

A



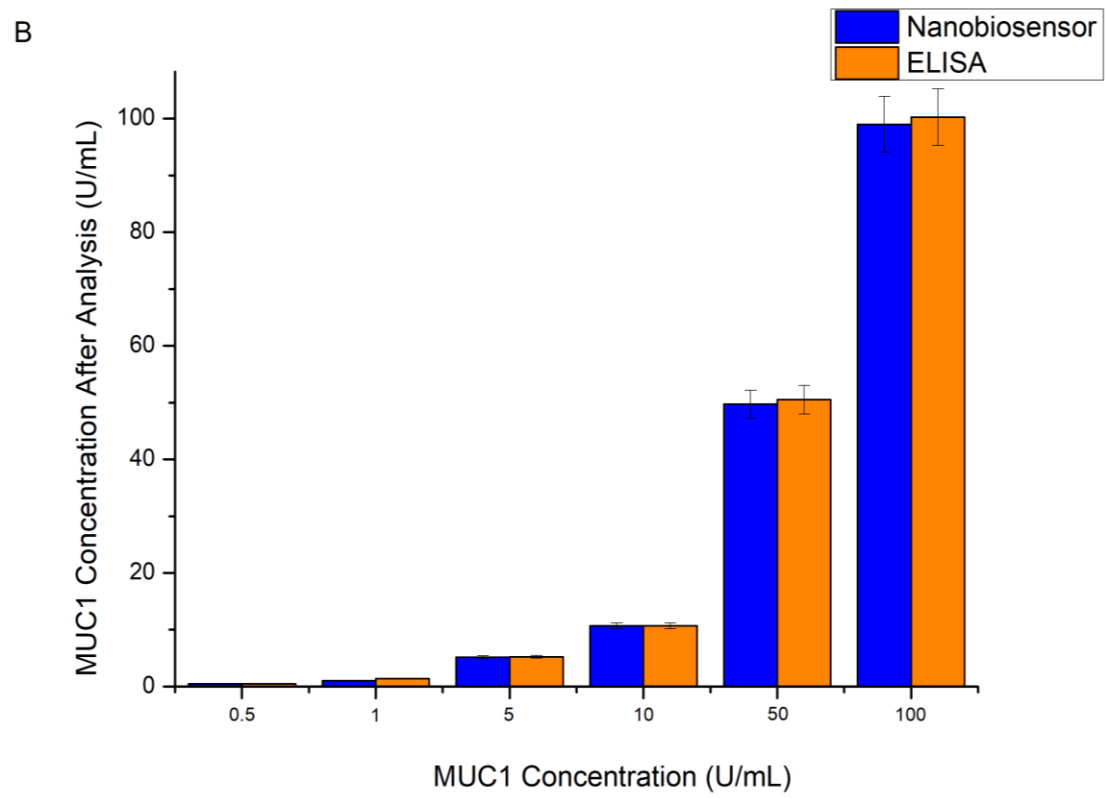


Figure 10. Results from comparison of our developed biosensor and a commercial kit (**A**) Calibration curve of ELISA kit (0.25–8 ng/mL), (**B**) Comparison the results of nanobiosensor and MUC1 ELISA kit.