Electronic Supplementary Material (ESI) for New Journal of Chemistry.

Comparison of Molecularly Imprinted Plasmonic Nanosensors Performances for Bacteriophage Detection

Özgecan Erdem[1], Nilüfer Cihangir[1], Yeşeren Saylan[2] and Adil Denizli[2*]

[1]Hacettepe University, Department of Biology, 06800, Ankara, Turkey

[2]Hacettepe University, Department of Chemistry, 06800, Ankara, Turkey

Supplementary file

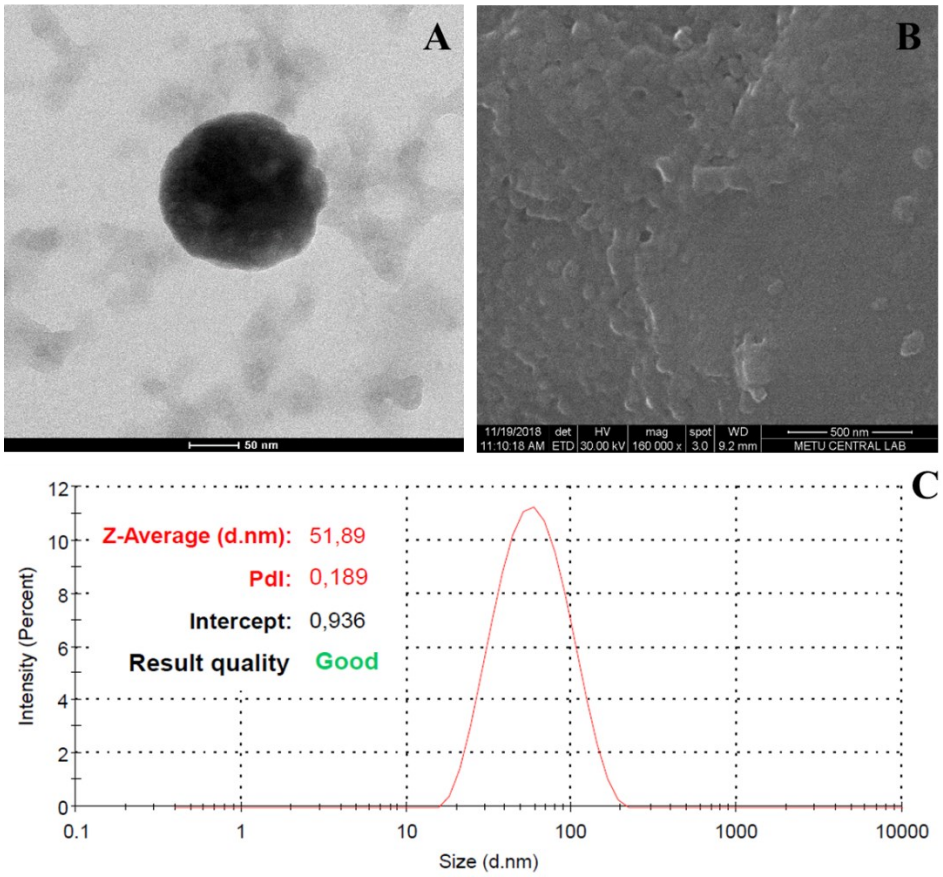

Fig. S1 TEM (A), SEM images (B), and size distribution (C) of non-imprinted nanoparticles.

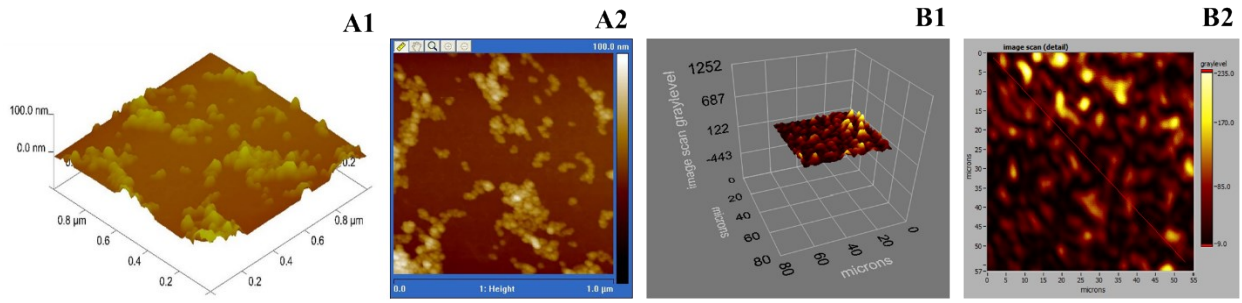

Fig. S2 Three- and two-dimensional AFM (A) and ellipsometry (B) images of non-imprinted nanoparticle-based plasmonic nanosensor.

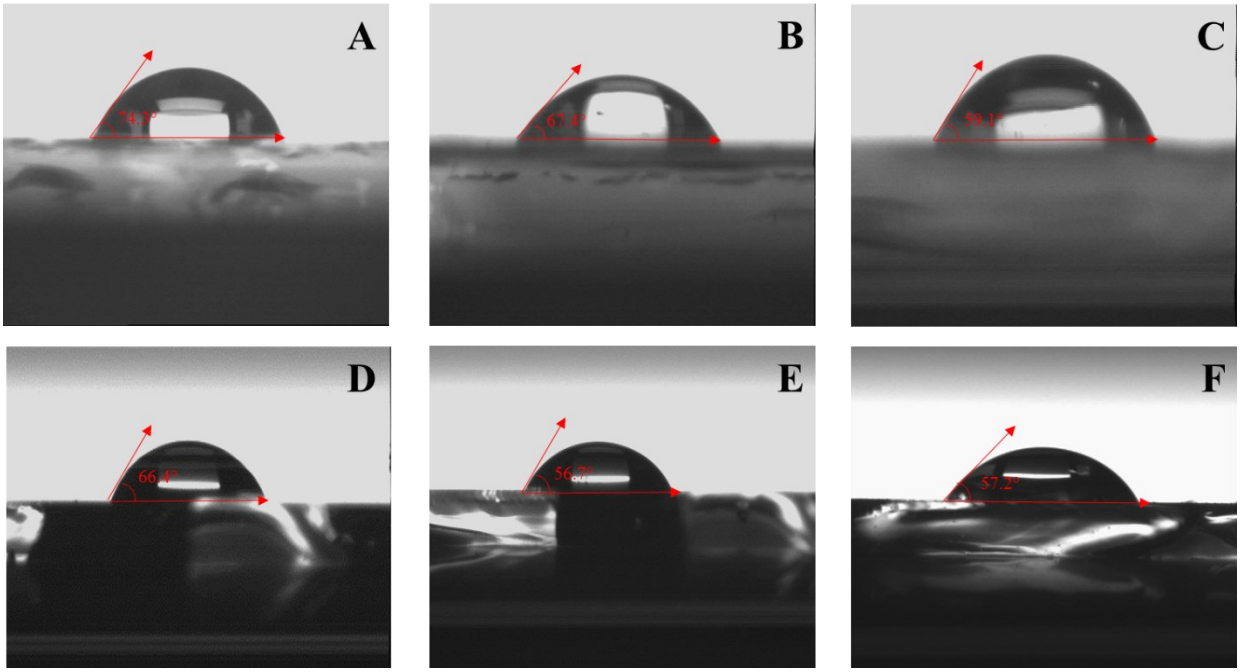

Fig. S3 Contact angle images of nanoparticle- (A: non-modified, B: non-imprinted and C: imprinted) and nanofilm- (D: modified, E: non-imprinted, F: imprinted) based plasmonic nanosensors.

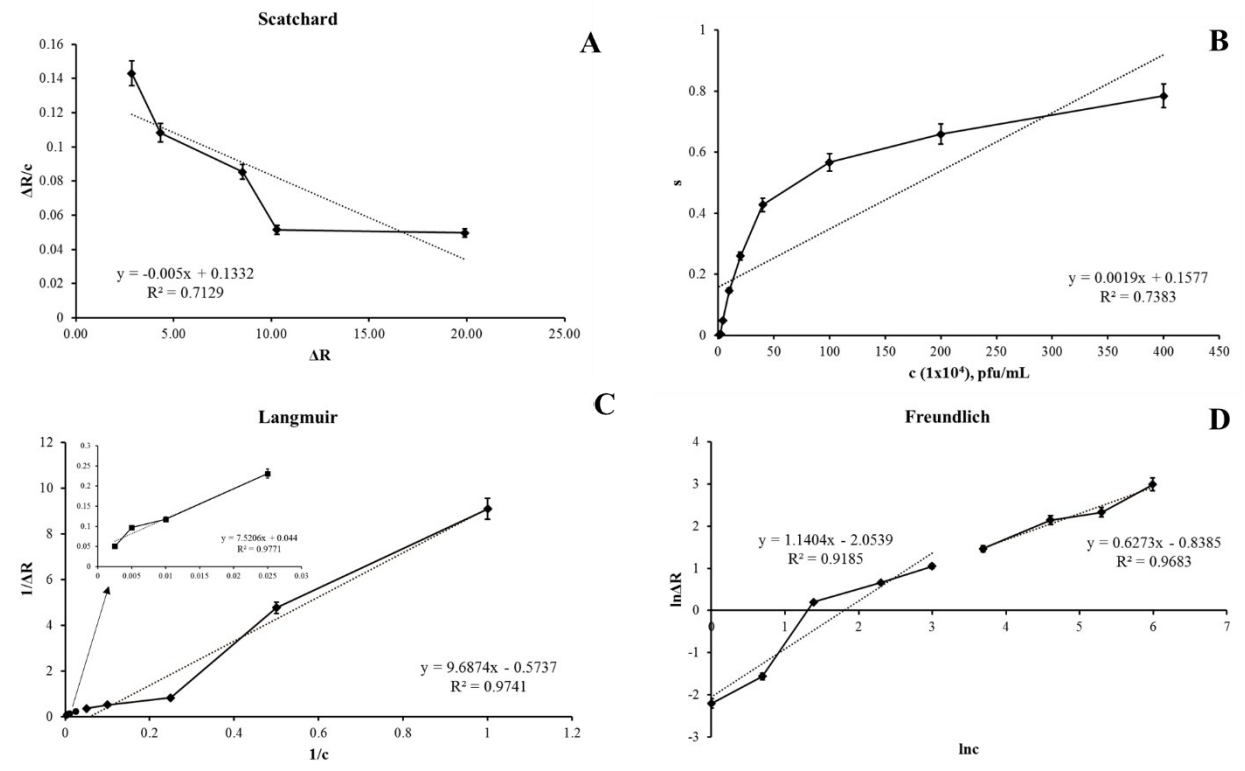

Fig. S4 Adsorption isotherm models for nanoparticle-based plasmonic nanosensor (A: Scatchard; B: Association; C: Langmuir and D: Freundlich).

Table S1. Binding parameters for nanoparticle-based plasmonic nanosensor.

Scatchard		**Association**	
ΔR_{max}	26.64	k_a, pfu/mL^{-1}.s^{-1}	0.002
K_A, mL/pfu	0.005	k_d, s^{-1}	0.158
K_D, pfu/mL	200	K_A, mL/pfu	0.012
R^2	0.71	K_D, pfu/mL	83.0
		R^2	0.74

Table S2. Kinetic parameters for nanoparticle-based plasmonic nanosensor.

Langmuir		**Freundlich**	
ΔR_{max}	22.73	ΔR_{max}	2.31
K_D, pfu/mL	170.9	1/n	0.63
K_A, mL/pfu	0.006	R^2	0.92
R^2	0.98		

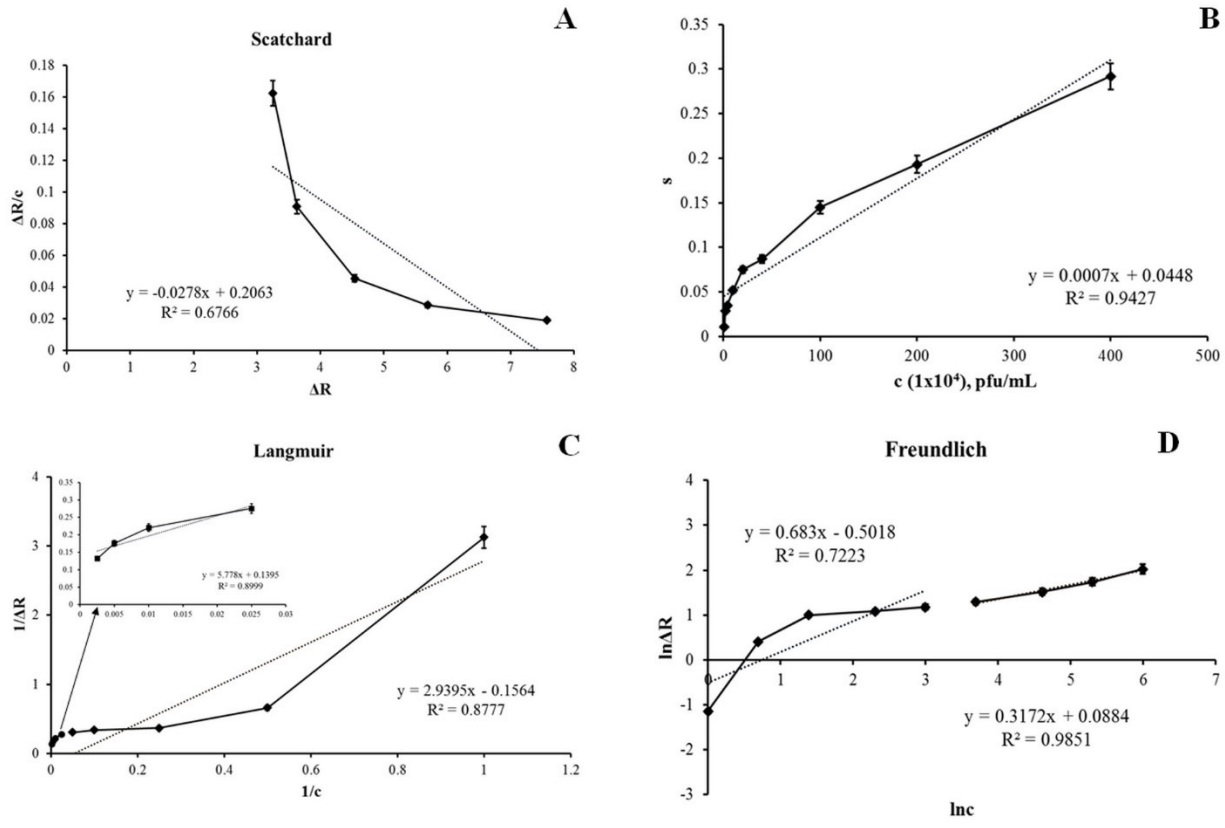

Fig. S5 Adsorption isotherm models for nanofilm-based plasmonic nanosensor (A: Scatchard; B: Association; C: Langmuir and D: Freundlich).

Table S3. Binding parameters for nanofilm-based plasmonic nanosensor.

Scatchard		**Association**	
ΔR_{max}	7.42	k_a, pfu/mL^{-1}.s^{-1}	0.001
K_A, mL/pfu	0.03	k_d, s^{-1}	0.045
K_D, pfu/mL	36.0	K_A, mL/pfu	0.02
R^2	0.68	K_D, pfu/mL	64.0
		R^2	0.94

Table S4. Kinetic parameters for nanoparticle-based plasmonic nanosensor.

Langmuir		**Freundlich**	
ΔR_{max}	7.17	ΔR_{max}	1.09
K_D, pfu/mL	41.4	1/n	0.32
K_A, mL/pfu	0.03	R^2	0.72
R^2	0.90		

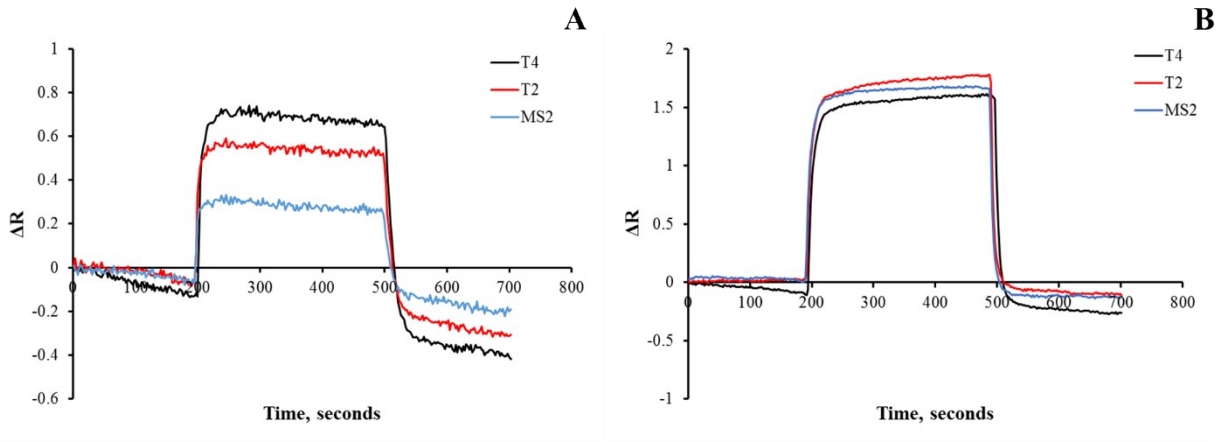

Fig. S6 Selectivity studies of non-imprinted nanoparticle- (A) and nanofilm- (B) based plasmonic nanosensors.

Table S5. Selectivity and relative selectivity of nanoparticle- (A) and nanofilm- (B) based plasmonic nanosensors.

A	**Imprinted**	**k**	**Non-imprinted**	**k**	**k'**
T4	19.89		0.68		
T2	3.82	5.21	0.53	1.28	4.07
MS2	3.61	5.51	0.26	2.62	2.11
B					
T4	7.57		1.61		
T2	2.51	3.02	1.77	0.91	3.32
MS2	1.88	4.03	1.67	0.96	4.21

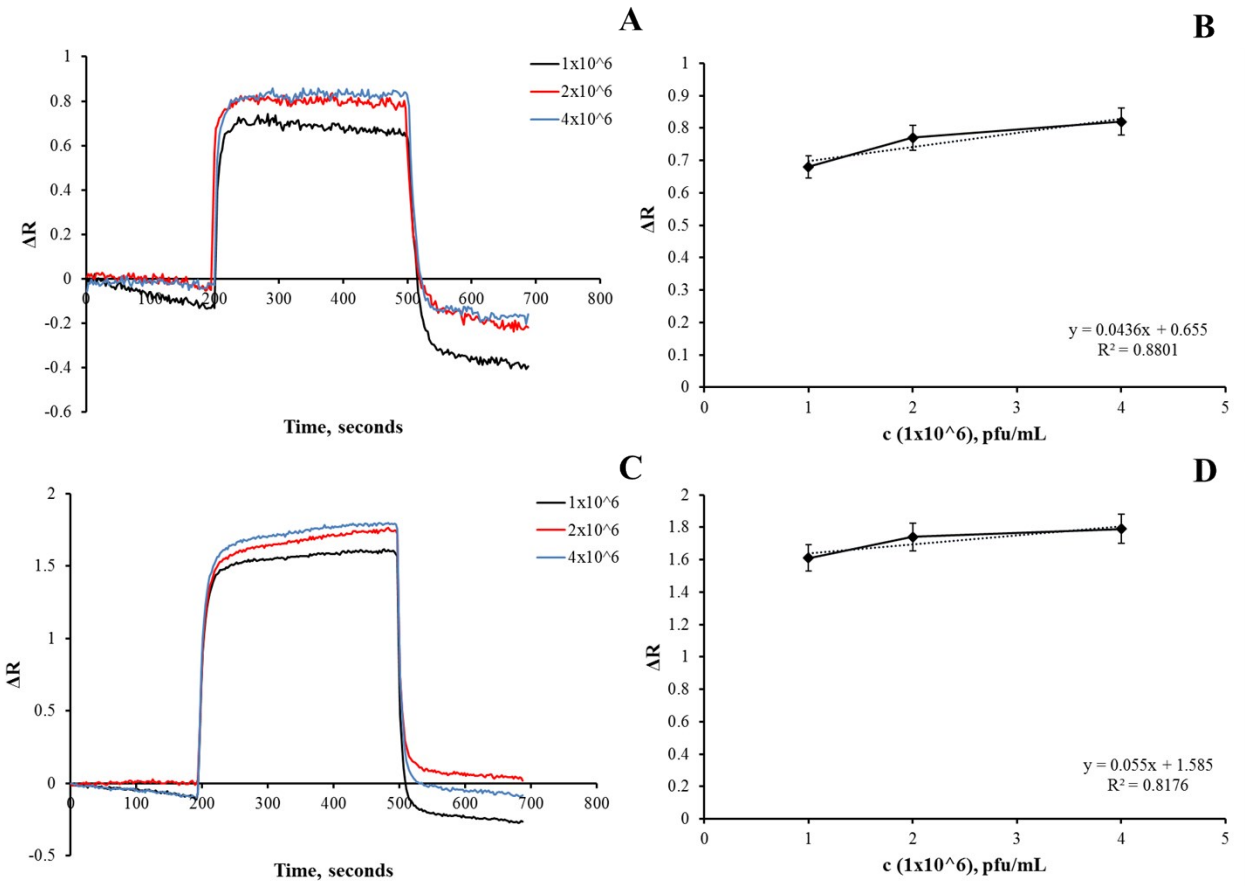

Fig. S7 Real-time bacteriophage detection and the corresponding relationship between the change of reflectivity and bacteriophage concentration for non-imprinted nanoparticle- (A, B) and nanofilm- (C, D) based plasmonic nanosensors.

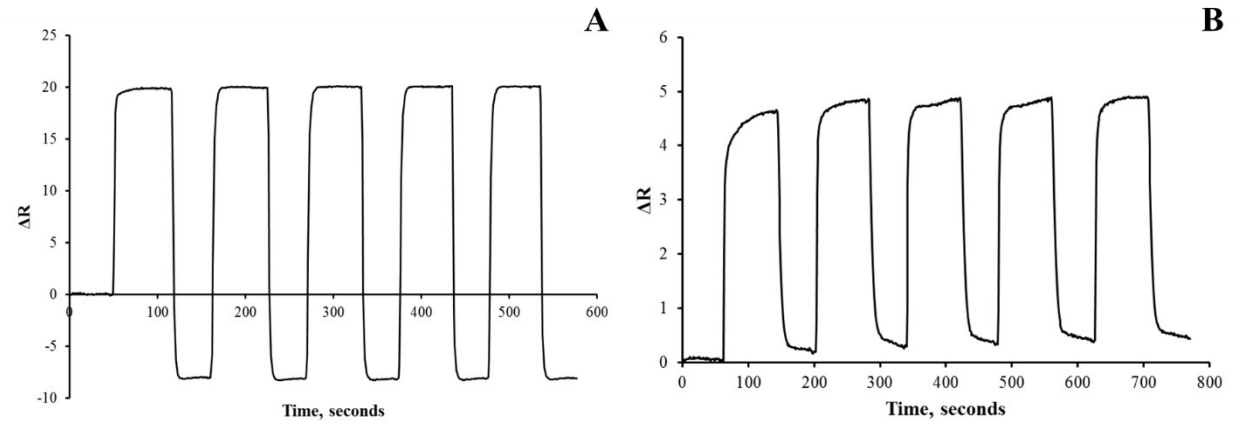

Fig. S8 Reusability studies of nanoparticle- (A) and nanofilm- (B) based plasmonic nanosensors.

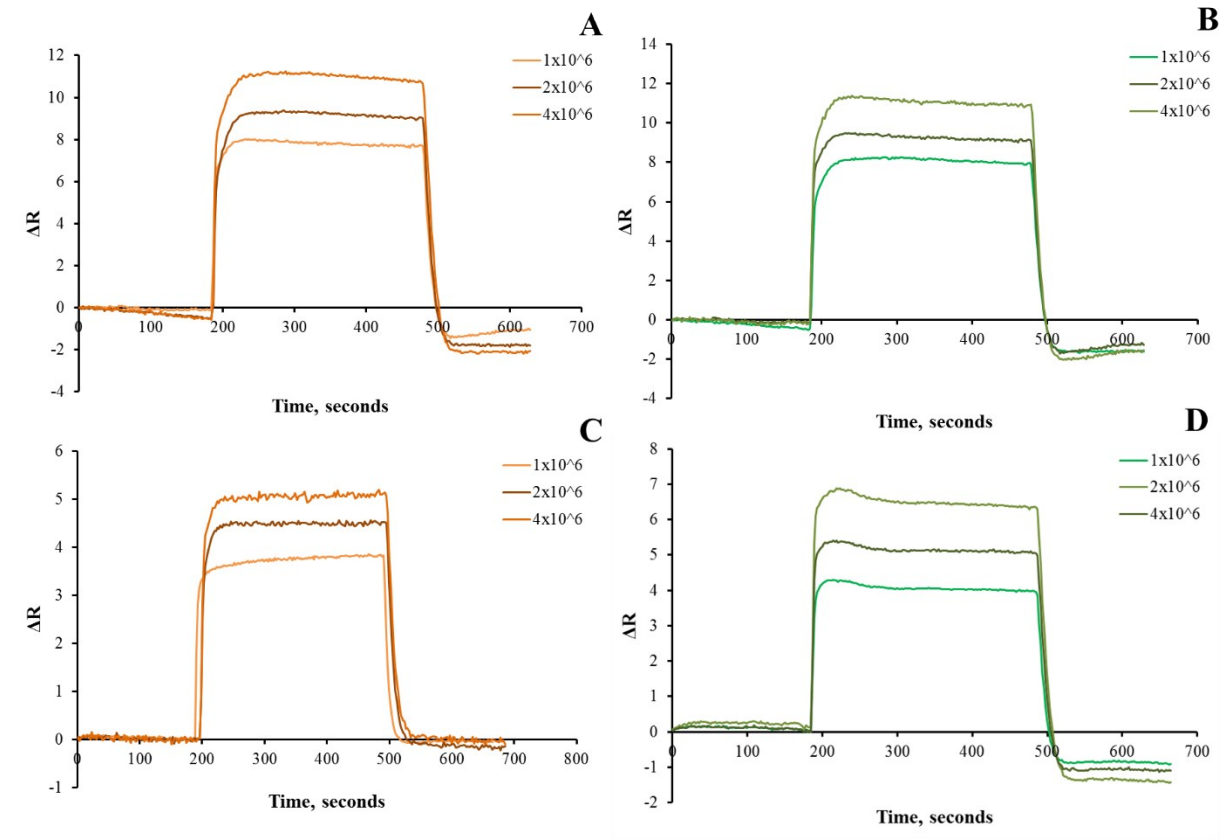

Fig. S9 Water (tap and sea) sample analysis of nanoparticle- (A, B) and nanofilm- (C, D) based plasmonic nanosensors in different bacteriophage concentration.