

Supplementary Information

A Versatile Nanowire Platform for Highly Efficient Isolation and Direct PCR-free Colorimetric Detection of Human Papillomavirus DNA from unprocessed Urine

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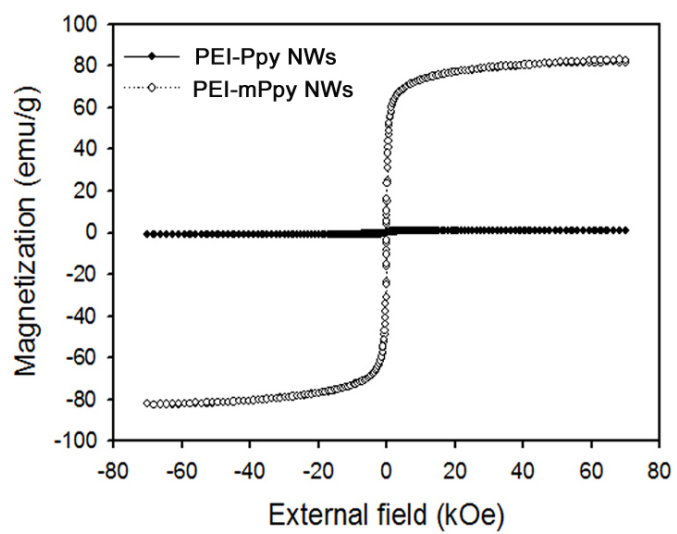
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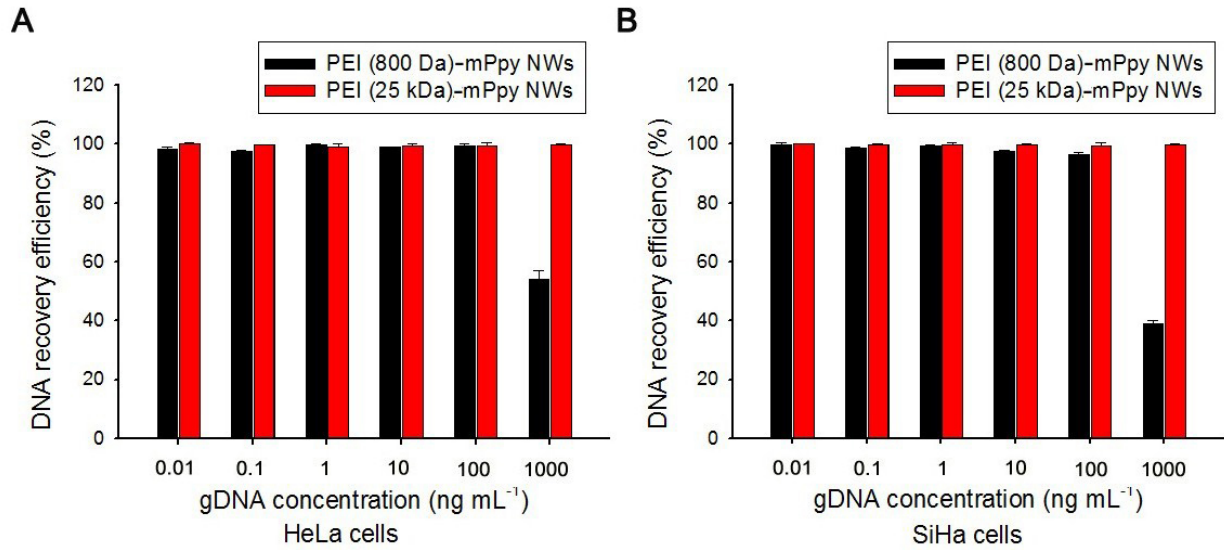
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Supporting Figure S1. Magnetic hysteresis loop of PEI-conjugated magnetic nanowires (PEI-mPpy NWs) and PEI-conjugated nanowires (PEI-Ppy NWs) at room temperature.



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PEI-mPpy NWs	No. positive/ No. tested	Mean C _T	Positive (%)	Roche cobas	No. positive/ No. tested	Mean C _T	Positive (%)
<i>SiHa (HPV 16)</i> (pg/uL)				<i>SiHa (HPV 16)</i> (pg/uL)			
5.2 (100 Cells/mL)	10/10	37.0	100	10.4 (200 Cells/mL)	60/60	36.9	100
2.6 (50 Cells/mL)	10/10	37.4	100	5.2 (100 Cells/mL)	60/60	38.0	100
1.6 (30 Cells/mL)	10/10	38.4	100	2.5 (50 Cells/mL)	53/60	39.3	88.3
0.5 (10 Cells/mL)	10/10	38.9	100				
0.16 (3 Cells/mL)	0/10	-	-	<i>HeLa (HPV 18)</i> (pg/uL)			
				3.2 (80 Cells/mL)	60/60	35.7	100
<i>HeLa (HPV 18)</i> (pg/uL)				1.6 (40 Cells/mL)	60/60	36.8	100
3.9 (100 Cells/mL)	10/10	35.8	100	0.8 (20 Cells/mL)	56/60	38.2	93.3
1.8 (50 Cells/mL)	10/10	36.3	100				
1.2 (30 Cells/mL)	10/10	38.0	100				
0.4 (10 Cells/mL)	3/10	39.0	30				
0.12 (3 Cells/mL)	2/10	39.0	20				

Supporting Figure S2. (a) and (b) Comparison of DNA recovery efficiencies of PEI-mPpy NWs by *ex vivo* spiking of a known concentration of genomic DNA from HPV-positive HeLa (HPV-18-positive) cells and SiHa (HPV-16-positive) cells into the HPV-negative urine pool, where PEI-mPpy NWs were conjugated with branched PEI of different molecular weights between 800 Da and 25 kDa. (c) The limit of detection (LOD) obtained for HPV DNA samples with HPV-16 and HPV-18 genotyping extracted by PEI-mPpy NWs (left) and developed by the Roche Cobas Test (right) [2]. A known concentration of genomic DNA from HPV-positive cell lines was spiked into the HPV-negative urine pool *ex vivo*, in order to analyze the performance of the nanowire in the isolation of DNA.