Supplemental Materials

1) Probe DNA immobilization

The maleimide of the maleimide-PEG-biotin linker reacted with the sulfhydryl of 3-mercaptopropyl-trimethoxysilane (MPS) on the MPS coating surface to form a thioester bond that covalently linked the maleimide-PEG-biotin on the MPS surface. The biotin of the immobilized maleimide-PEG-biotin then reacted with streptavidin to immobilize streptavidin on the PEPS surface. This was followed by the binding of biotin at the 5' end of the pDNA with the streptavidin bound on the biotin of the immobilized maleimide-PEG-biotin to finally immobilize pDNA on the PEPS surface. The steps of this immobilization are shown in Figure S1.

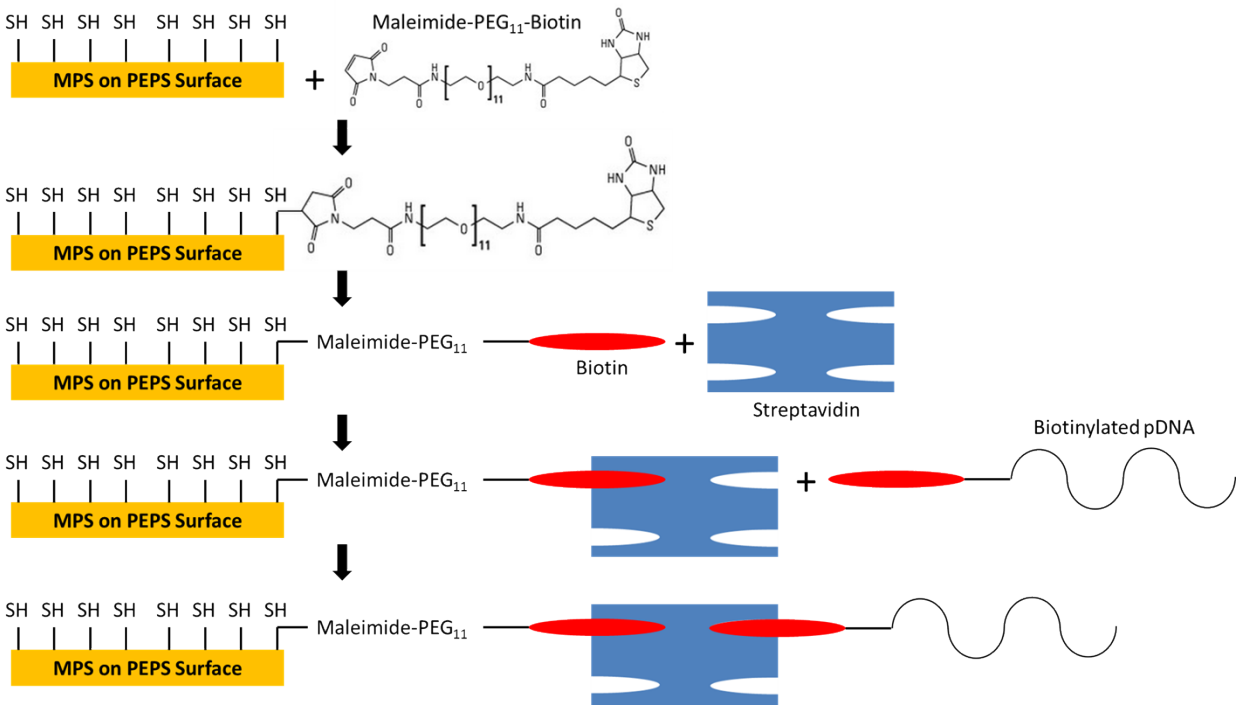

Figure S1. A schematic of the biotin-streptavidin-biotin sandwich immobilization scheme.

2) Detection of tDNA in PBS using PEPS A

Detections of different concentrations of tDNA in PBS using PEPS A are shown below. The resultant Δf/f versus time obtained using the multiple-parabola fitting algorithm as described in the manuscript is shown in Figure S2. Also shown is the Δf/f versus time of the following fluorescent microspheres FRM) detection also obtained by the multiple parabola fitting algorithm. Note all curves were the average of three independent detections at the same concentration. The pDNA immobilization and the tDNA preparation steps were carried out the same way as described in the text.

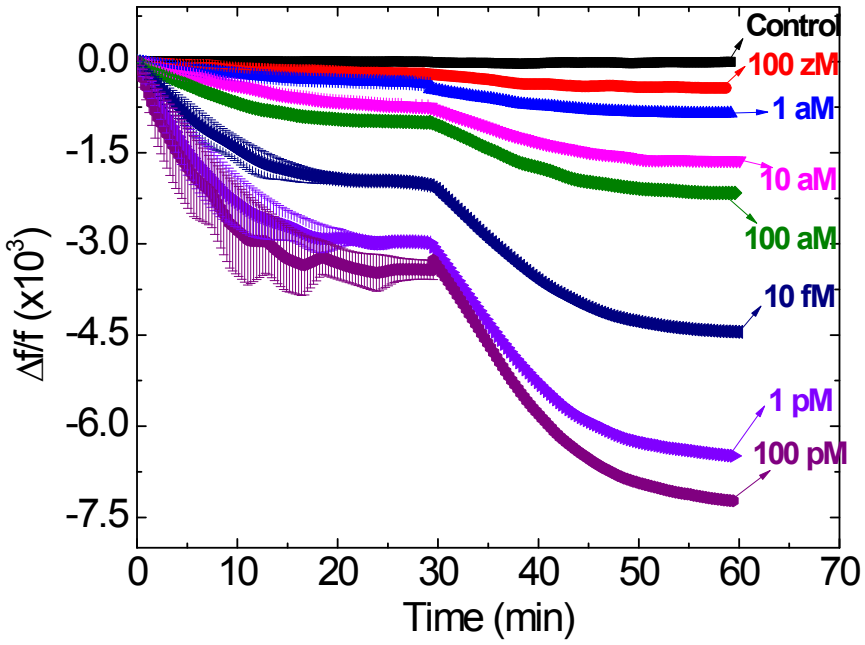

Figure S2. Δf/f versus time of tDNA detection and the following FRM detection at various tDNA concentrations in PBS as obtained using the multiple-parabola fitting algorithm.