ANALYTICAL METHODS

ELECTRONIC SUPPLEMENTARY INFORMATION FOR:

MICROFLUIDIC DEVICES FOR LABEL-FREE AND NON-INSTRUMENTED QUANTITATION OF UNAMPLIFIED NUCLEIC ACIDS BY FLOW DISTANCE MEASUREMENT

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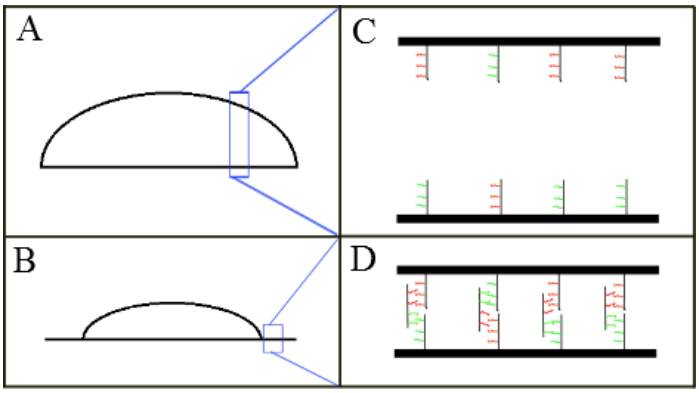

Figure S1. DNA sensing platform. (A) Cross-section view of an unconstricted channel. (B) Cross section of a partially constricted channel caused by complementary target sequence hybridization with surface receptors. (C) Zoom view of the rectangle in A, showing an unconstricted channel before flowing target; not drawn to scale in the vertical direction. (D) Zoomed in view of the rectangle in (B), showing constriction from target hybridization.

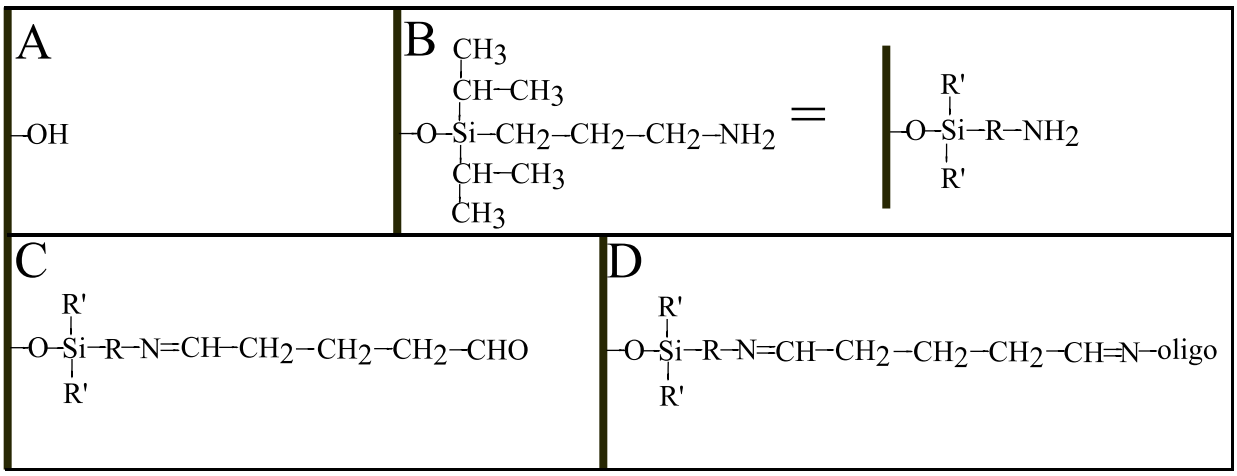

Figure S2. Surface attachment of oligonucleotide receptors. Thick vertical lines represent PDMS channel wall. (A) Plasma-oxidized channel has silanol groups on the surface. (B) Treatment with APDIES generates amine groups on the surface. (C) Amine groups react with glutaraldehyde. (D) Amine-modified oligonucleotide immobilized on the channel surface via glutaraldehyde.

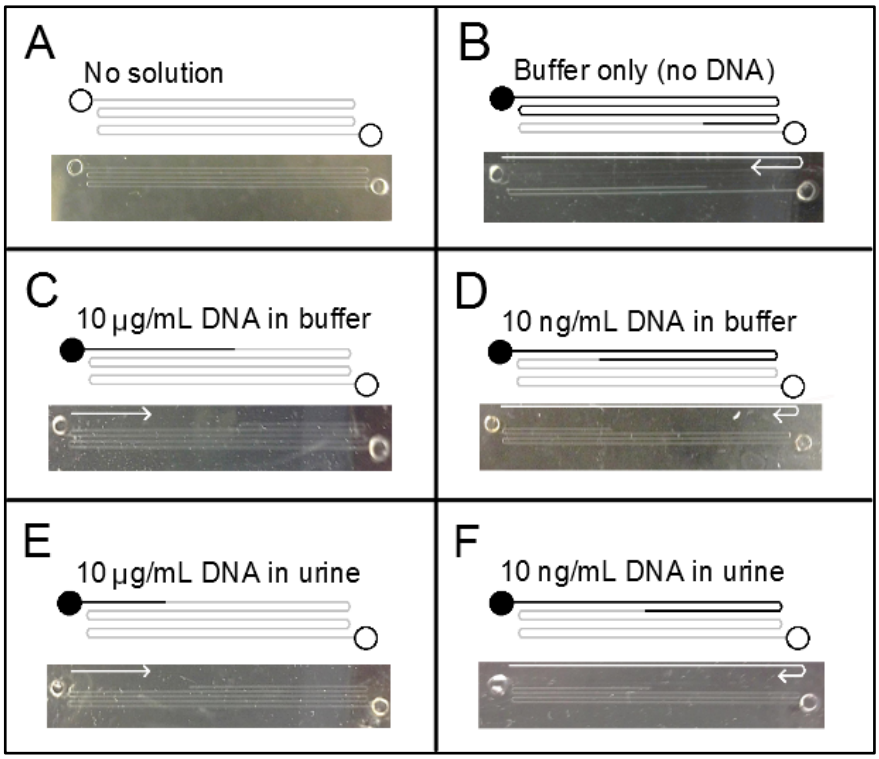

Figure S3. Flow assay data. Each panel has a device schematic on top and a device photograph beneath with white arrows showing the flow direction. (A) Empty channel is readily visible. (B) Channel with buffer solution lacking target DNA flows 134 mm; the empty channel segment is distinct from the filled portion. (C) 26 mm flow distance for 10 µg/mL model target in buffer. (D) 66 mm flow distance for 10 ng/mL model target in buffer. (E) 16 mm flow distance for 10 µg/mL model target in synthetic urine. (F) 61 mm flow distance for 10 ng/mL model target in synthetic urine.

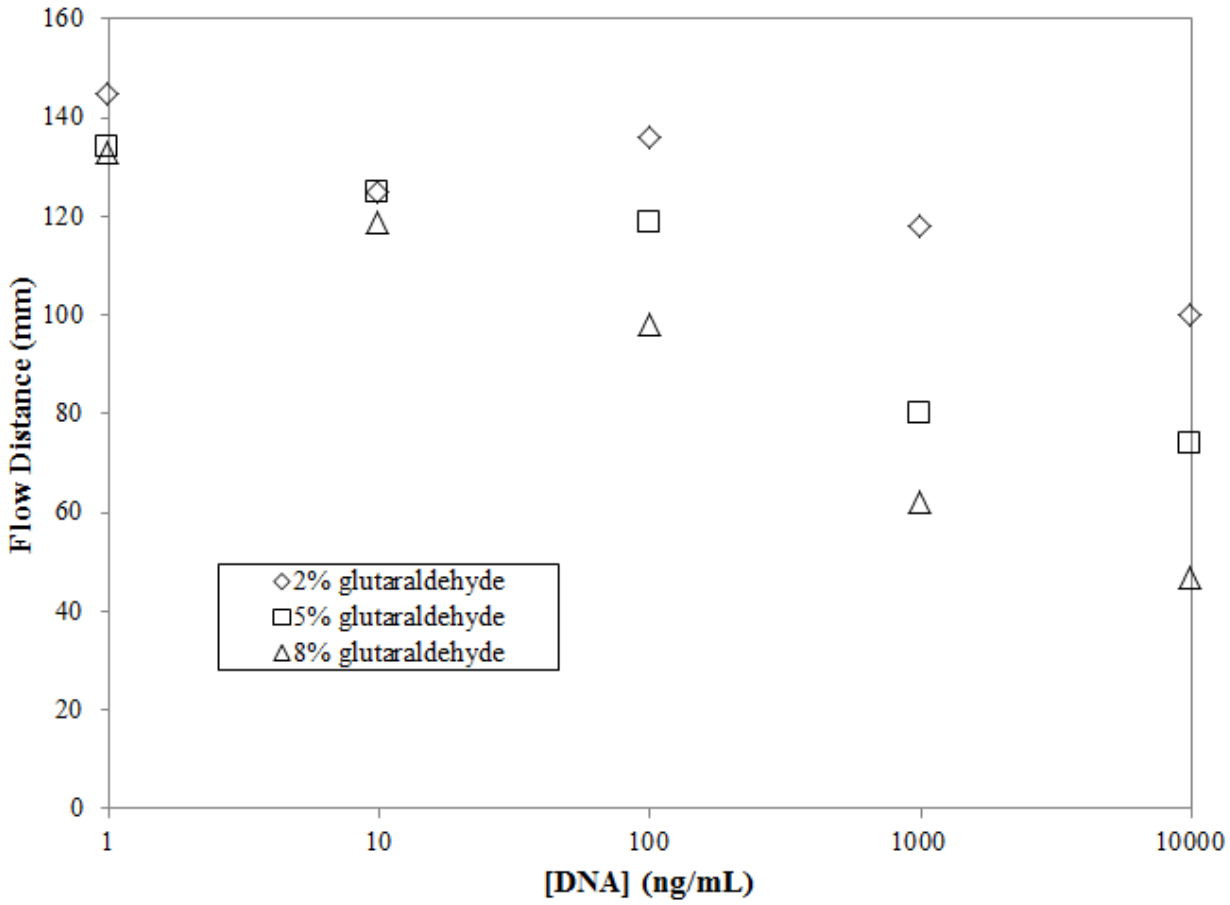

Figure S4. Flow distance as a function of logarithm of model target concentration in buffer for 2%, 5% and 8% glutaraldehyde for model receptor attachment in channels derivatized with 2% APDIES.