# Microfluidic nanoplasmonic-enabled device for multiplex DNA detection

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**Supporting Information**

**Array Imaging**. With our current imaging (epifluorescence microscope) and microarray setup (inter particle distance of ~ 250 μm), four probe spots can be identified within one fluorescence image under 10X (S1A) objective magnification, and 8 spots under 4X (S1B) objective magnification. By arraying spots in columns, we were able to incorporate two columns of spots into a single channel. One could further decrease the inter-spot distance to accommodate more DNA probe spots into the channel and enhance the sample throughput.

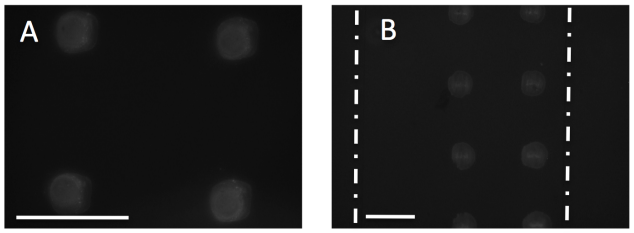
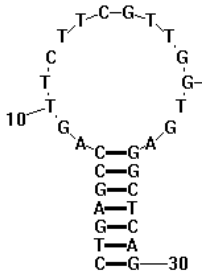
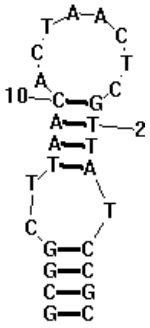



**Figure S1.** Fluorescence microarray images showing DNA hairpin probe spots on the channel floor (under fluidic flow). (A) 10X objective, CCD exposure time: 10 s. (B) 4X objective, CCD exposure time: 20 s. Dotted lines: Channel walls. Scale bar: 250 μm.

**Design of probe hairpins for *E. coli* and *Enterobacter*.** Probe design was carried out according to the procedure outlined in C. M. Strohsahl, T. D. Krauss and B. L. Miller, *Biosens. Bioelectron*., 2007, **23**, 233. In brief, segments of genomic DNA obtained from public databases were subjected to secondary structure prediction using the computer program *RNAStructure*. Candidate probes were selected from the secondary structure prediction by visual inspection, then excised from the genomic context and re-subjected to folding. The energy of the duplex was also predicted. The two probes used in this study were chosen based on their strongly favorable predicted folding and duplex-forming energies.



Eco3a[i]
ΔG = -5.3 kcal/mol
$\Delta G_{DUP}$ = -41.3 kcal/mol



Entbc3a[ii]

ΔG = -4.0 kcal/mol

$\Delta G_{dup}$ = -36.1 kcal/mol

[i] Derived from Genbank M64331.1: Dykhuizen, D.E.; Green, L. "Recombination in *Escherichia coli* and the definition of biological species." *J. Bacteriology*, **1991**, *173*, 7267-7268.
[ii] Derived from Genbank EF123216.1: Son, M.-K.; Hong, S.-J.; Lee, Y.-H. *direct submission.*