Supporting information

Supplemented experimental section

RCA reaction to produce the ssDNA product

The target sequence and the linear padlock probes were denatured at 95 °C for 5 min before being gradually cooled to room temperature. 1 U of T4 DNA ligase was then added after the mixture had been incubated at 50 °C for 60 min. For 60 min, the ligation mixture was incubated at 30 °C. Then, each reaction received 1 L of an exonuclease mixture containing 1 U of exonuclease I and 0.5 U of exonuclease III. The mixed solution underwent a 1-h incubation period at 37 °C, followed by a 15-min inactivation period at 95 °C. The above-mentioned products were then introduced to RCA reaction system along with 10 μL phi 29 DNA polymerase buffer, 1 mM biotin-labeled primer, 1.5 U phi29 DNA polymerase, 1 mM dNTPs for 90 min and inactivated at 65 °C for 10 min. For additional examination, the end results—long, reduplicated single-strand DNA sequences - that had been biotin labeled at the 5′ terminus were employed.

Table S1. Sequences used in this research for bacteria detection.

Title	Sequences (5’ to 3’)	Labeling
Padlock	P-CAA GAA AGG AAG CAG GGA CGA AAC GAA CAA AAG CGA AAG GAA AAG CGA AAG CAA CGG GGG TTT TTT TTT TTT TTT TTT TTA CCC CCG TTG CTT TCG CTT AAC GGA TTG AAC	
s1 chain	TTT TTT TTT AC AAT GTC ACA CGG ATT CA	3’-biotin
LP	GTT CAA TCC GTT AAG CGA GAA CAA AAC GGA TTG	
F-LP	GTT CAA TCC GTT AAG CGA GAA CAA AAC GGA TTG	3’-BHQ; 5’-FAM