Electronic Supplementary Material (ESI) for Lab on a Chip.

Supporting Information

A Distance-based Capillary Biosensor Using Wettability Alteration

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Table S1. Nucleic acid sequences used for this work.

Name	Sequences
Hydrophobic Probe	5'-NH_2-ATATAATCCTCAGCG-Bodipy493/503-3'
Hairpin Probe	5'-GCGTCAACATCAGTCTGATAAGCTACGCTGAGGA-3
miRNA-21	5'-UAGCUUAUCAGACUGAUGUGA-3'
miRNA-16	5'-UAGCAGCACGUAAAUAUUGGCG-3'
miRNA-24	5'-UGGCUCAGUUCAGCAGGAACAG-3'
miRNA-26a	5'-UUCAAGUAAUCCAGGAUAGGCU-3'

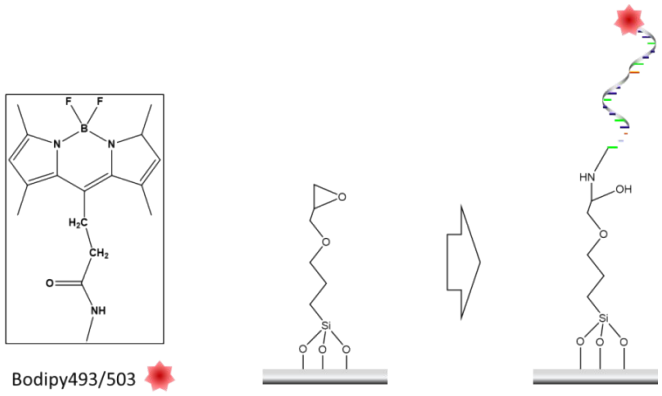

Figure S1. The principle of chemical graft of hydrophobic DNA.

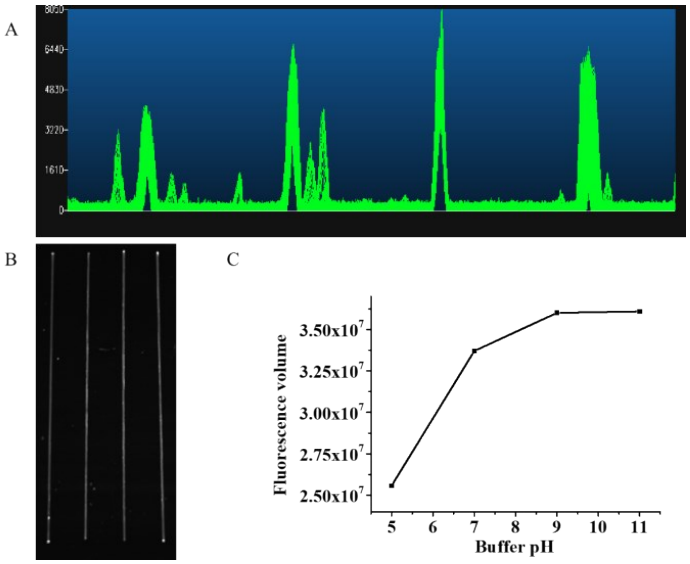

Figure S2. PH optimization of grafting environment of hydrophobic DNA. (A) Fluorescence analysis of glass tube after being grafted under different pH conditions; (B) Fluorescence photographs of glass tubes after being grafted under different pH conditions; (C) A broken line diagram of fluorescence intensity of glass tube after being grafted under different pH conditions.

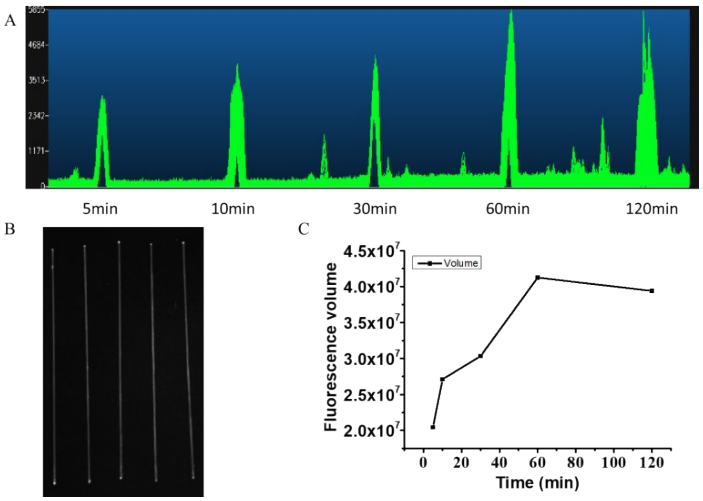

Figure S3. Time optimization of grafting environment of hydrophobic DNA. (A) Fluorescence analysis of glass tube after being grafted under different temperature conditions; (B) Fluorescence photographs of glass tubes after being grafted under different temperature conditions; (C) A broken line diagram of fluorescence intensity of glass tube after completion of graft under different temperature conditions.

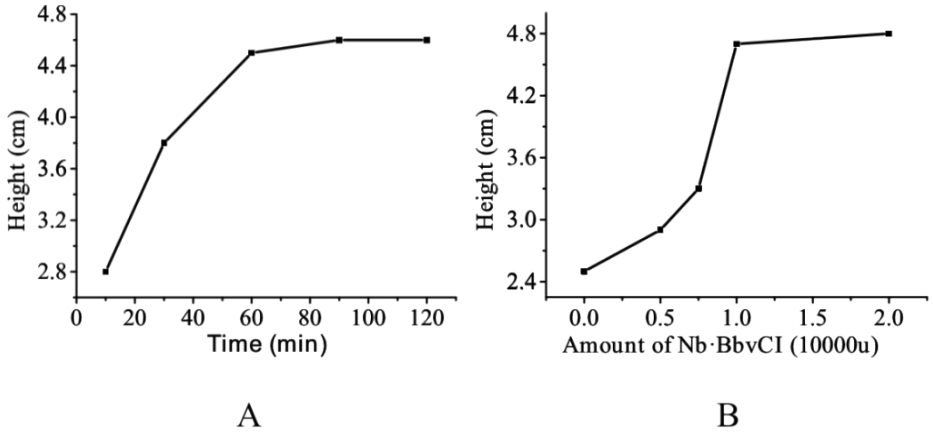

Figure S4. Optimization of detection conditions. (A) nicking enzyme reaction time, (B) amount of Nb·BbvCI.

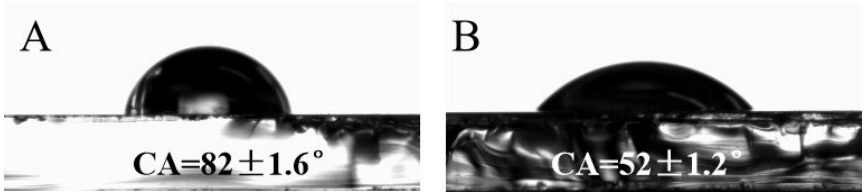

Figure S5. Static contact angles (CAs) of 2.0 μL water on the surface of glass slides modified with DNA molecular layer after being treated by solution(A) Blank and (B)1nM miRNA.

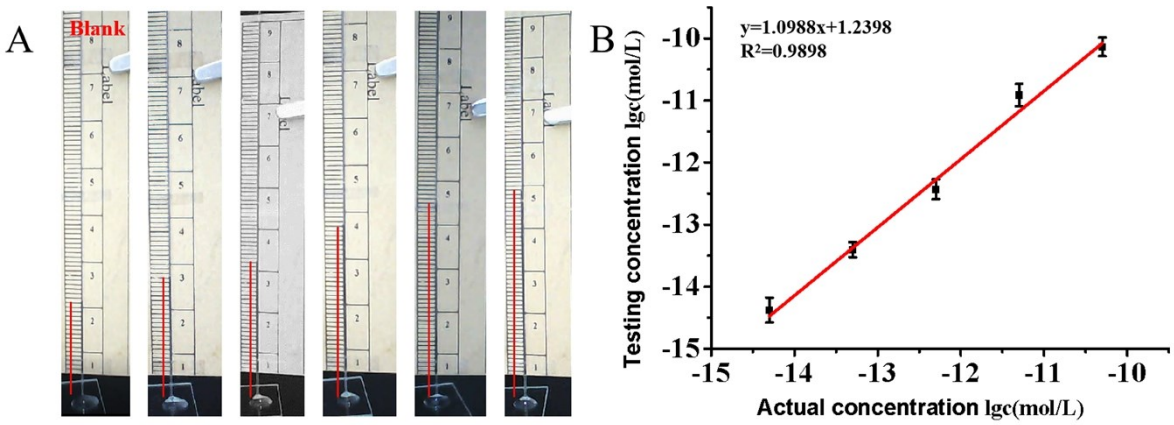

Figure S6. Recovery results of testing diluted human serum samples. (A) Photos of the results of serum samples. (B) Detection results of serum samples with different miRNA21 concentrations by capillary sensor.