

A PDMS-Paper Hybrid Lateral Flow Assay for Highly Sensitive Point-of-Care Nucleic Acid Testing

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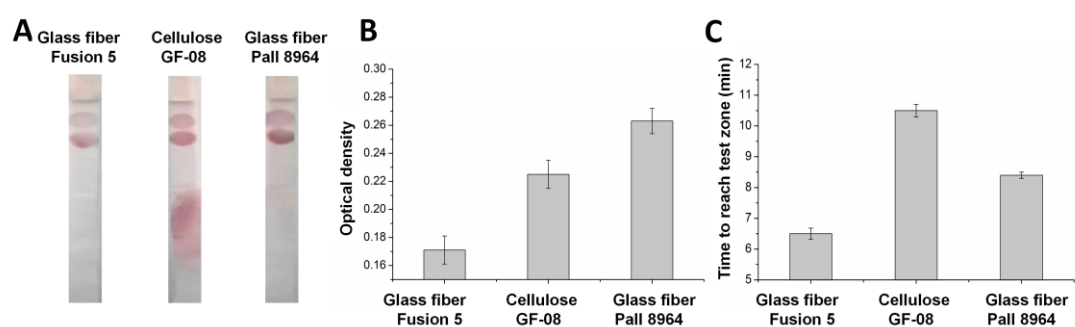
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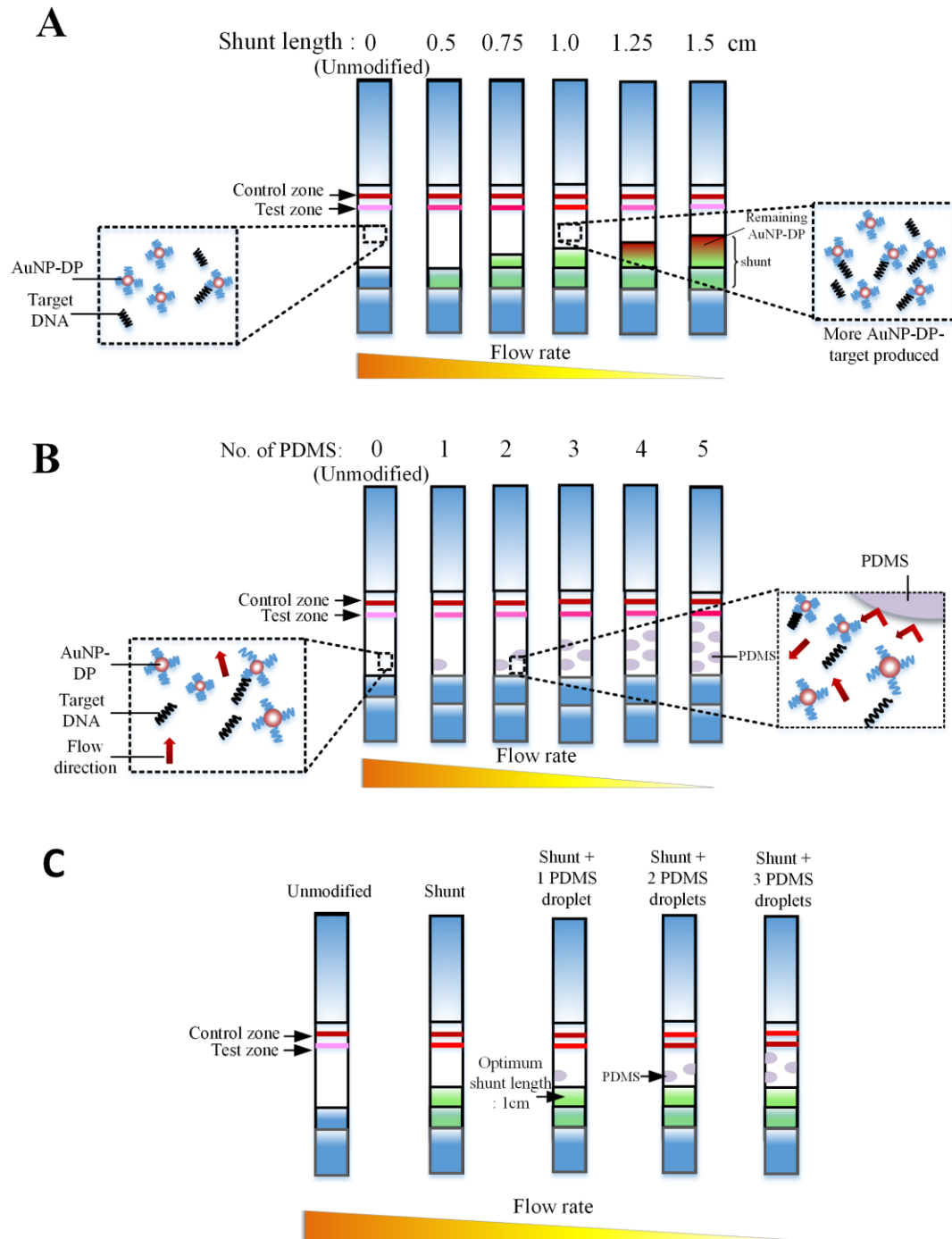
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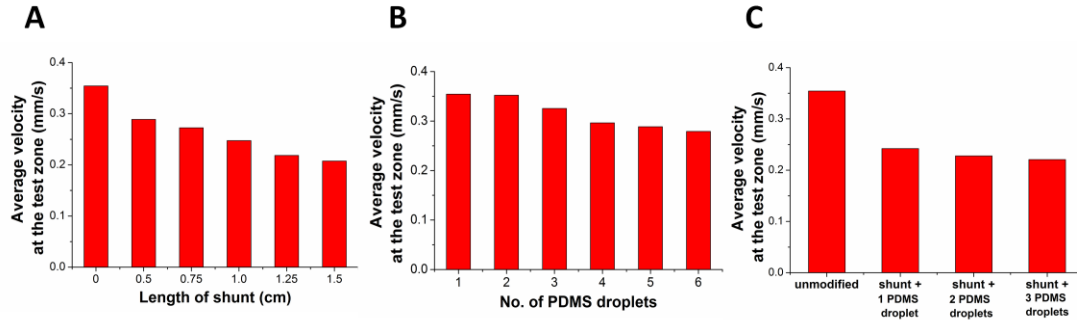


Supplementary Figure S1. Selection of an appropriate shunt material. (A-B)

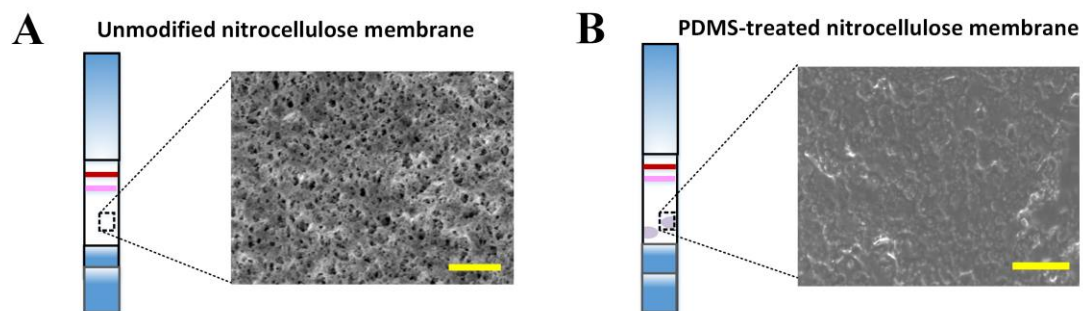
Glass fiber Pall 8964 showed a significant higher optical density of the test zone (0.225 ± 0.01) with (C) desirable duration required to reach the test zone as compared to that of Fusion 5 and Cellulose.



Supplementary Figure S2. Schematic of modified lateral flow strips. (A) Lateral flow strips with glass fiber shunt, **(B)** PDMS barrier and **(C)** the combination of both glass fiber shunt and PDMS barrier.



Supplementary Figure S3. The average velocity at the test zone. (A) The longer the length of the shunt, the lower the average velocity at the test zone. **(B)** The higher the number of PDMS droplets, the lower the average velocity at the test zone. **(C)** The combination of both shunt and PDMS droplets decreases the average velocity at the test zone.



Supplementary Figure S4. Characterization of LFA incorporated with PDMS barrier. The SEM images of (i) unmodified nitrocellulose membrane and (ii) PDMS treated nitrocellulose membrane (Scale bars, 50 μm).

Supplementary Table 1. Oligonucleotide sequences used in the study

Name	Sequence (5'-3')
HBV detector probe	5' - atgaatctggccacctgggt -(CH ₂) ₆ -SH-3'
HBV control probe	5' - acccaggtggccagattcat /Biotin-3'
HBV F3	5' - cttctgtggagtactctctt-3'
HBV B3	5' - gctgactactaattccctgg-3'
HBV FIP	5'-Biotin/ ctcccatacagagcagaggttgccttctgacttctttcc-3'
HBV BIP	5' - ttgtcacctcaccatacagcatgggtcttccaaattacttcc-3'
HBV FLP	5' - ggtgtcgaggagatctcgaata-3'
HBV BLP	5' - attctgtgtggggtgagtt-3'
HBV target DNA	5' - acccaggtggccagattcat -3'

Supplementary Table 2. HBV-positive clinical samples confirmed by qPCR

Sample	Concentration (IU/mL)
a	3.18×10^5
b	7.33×10^6
c	1.96×10^5
d	1.34×10^2
e	3.07×10^3
f	1.56×10^2
g	2.72×10^4
h	1.92×10^7
i	2.92×10^4
j	5.35×10^8
k	3.42×10^8
l	2.04×10^2
m	2.64×10^3
n	7.07×10^6
o	2.72×10^4
p	1.59×10^2