Supplemental Materials

Investigation of DNA Hybridization on Nano-Structured Plasmonic Surfaces for Identifying Nasopharyngeal Viruses

Shao-Sian Li [1,†], Yi-Jung Lu [2,†], Ray Chang [3], Ming-Han Tsai [4], Jo-Ning Hung [4], Wei-Hung Chen [3], Yu-Jui Fan [5,*], Pei-Kuen Wei [6,*] and Horn-Jiunn Sheen [3,*]

[1] Department of Materials and Mineral Resources, National Taipei University of Technology, Taipei 10608, Taiwan; ssli@mail.ntut.edu.tw
[2] Division of Family and Operative Dentistry, Department of Dentistry, Taipei Medical University Hospital, Taipei 11031, Taiwan; yi_jung2002@yahoo.com.tw
[3] Institute of Applied Mechanics, National Taiwan University, No. 1, Section 4, Roosevelt Rd, Taipei 10617, Taiwan; d11543004@ntu.edu.tw (R.C.); r09543071@ntu.edu.tw (W.-H.C.)
[4] Institute of Microbiology & Immunology, National Yang Ming Chiao Tung University. No. 155, Section 2, Linong St., Beitou District, Taipei 11221, Taiwan; m.tsai@gm.ym.edu.tw (M.-H.T.); cheeseerer0707@gm.ym.edu.tw (J.-N.H.)
[5] School of Biomedical Engineering, College of Biomedical Engineering, Taipei Medical University, Taipei 11031, Taiwan
[6] Research Center for Applied Sciences, Academia Sinica, 128 Academia Road, Section 2, Nankang, Taipei 11529, Taiwan
* Correspondence: ray.yj.fan@tmu.edu.tw (Y.-J.F.); pkwei@sinica.edu.tw (P.-K.W.); sheenh@ntu.edu.tw (H.-J.S.)
† These authors contributed equally to this work.

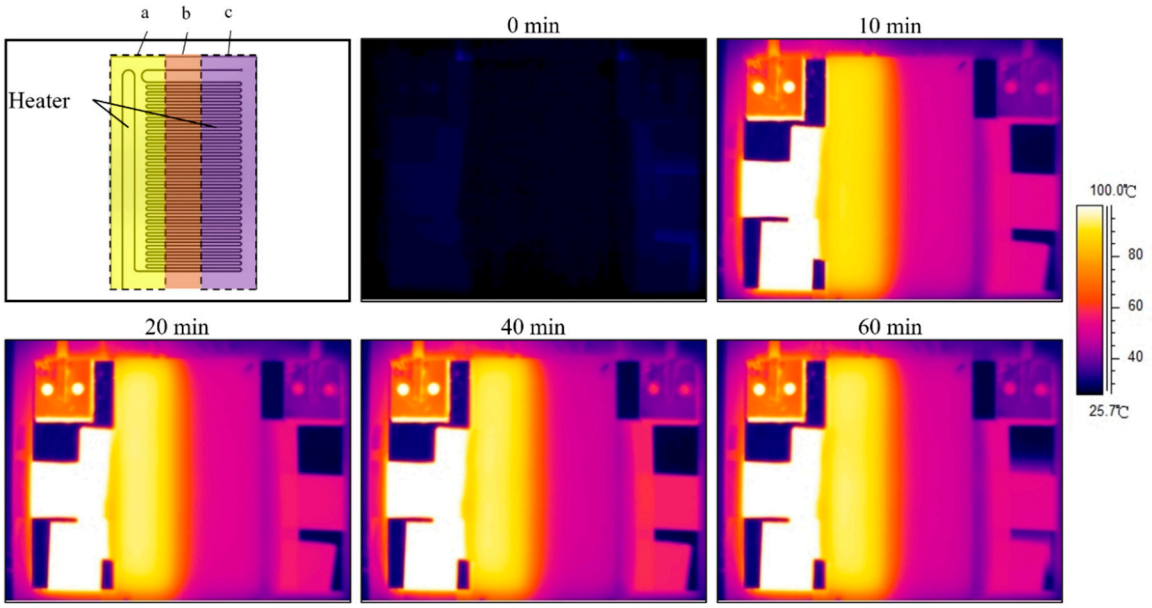

Figure S1. Characterization of the device. Temperatures were steady in the three regions; a (95 °C), b (65 °C), and c (50 °C). These temperature regions are used for denaturation (95 °C), extension (80-65 °C), detection (65 °C), and annealing (50 °C).

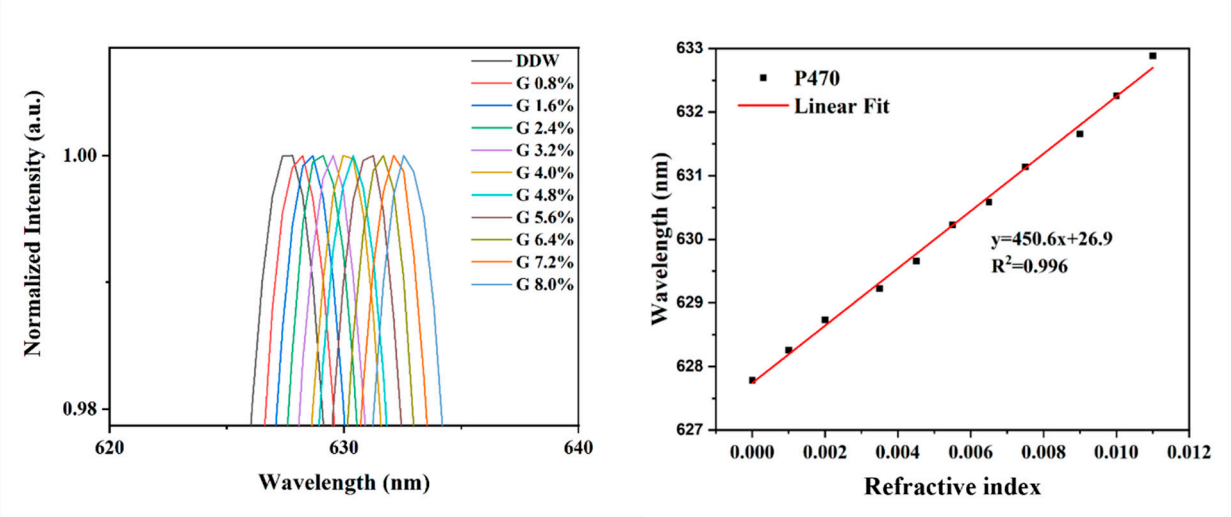

Figure S2. Relations between the resonance wavelength and refractive index in different glucose solutions.

Table S1. Primer templates and probes

	COVID-19 N-gene	*LMP1*
Template	5′-CACATTGGCACCCGCAATCCTGCTA ACAATGCTGCAATCGTGCTACAACTT CCTCAAGGAACAACATTGCCAAAAGG CTTCTACGCAGAAGGGAGCAGAGGCG GCAGTCAAGCCTCTTCTCGTTCCTC-3′	5′-AGCGACTCTGCTGGAAATGATGGA GGCCCTCCAAAATTGACGGAAGAGGT TGAAAACAAAGGAGGTGACCGGGGCC CGCCTTCGATGACAGACGGTGGCGGC GGTCATCCACACCTTCCTACACTGCTT TTGGGTACTTCTGGTTCCGGTGGAGAT GATGACGACCCCCACGGCCCAGTTCA GCTAAGCTACTATGACTAACCTTTCTT TACTTCTAGGCATTACCATGTCATAGG CTTGCCTGACTGACTCTCCCTCCATTT ACTGGGAATGCCTTAGCTAATCA -3′
Forward	5′-CAC ATT GGC ACC CGC AAT C-3′	5′-AGC GAC TCT GCT GGA AAT GAT-3′
Reverse	5′-GAG GAA CGA GAA GAG GCT TG-3′	5′-TGA TTA GCT AAG GCA TTC CCA-3′
Probe	5′- TGG CAA TGT TGT TCC TTG AGG AAG T -3′	5′-GTC ATA GTA GCT TAG CTG AAC TGG GCC GT-3′
Probe's T_m	58.8 ℃	63.7 ℃

Table S2. Solution composition for PCR

	Volume	Final concentration
2X Master Mix	50 µl	1X
Primer F (10 µM)	2 µl	0.2 µM
Primer R (10 µM）	2 µl	0.2 µM
DNA template (10 ng/µL)	1 µl	-
Nuclease-free water	25 µl	-
Total volume	100 µl	-

Table S3. Solution composition for duplex PCR

	Volume	Final concentration
2X Master Mix	50 µl	1X
COVID-19 N-gene Primer F (10 µM)	2 µl	0.2 µM
COVID-19 N-gene Primer R (10 µM)	2 µl	0.2 µM
COVID-19 N-gene DNA template (10 ng/µL)	1 µl	-
LMP1_Primer F (10 µM)	2 µl	0.2 µM
LMP1_Primer R (10 µM)	2 µl	0.2 µM
LMP1 DNA template (10 ng/µL)	1 µl	-
Nuclease-free water	25 µl	-
Total volume	100 µl	-

Table S4. The conditions of the traditional PCR machine.

Initial denaturation	95 ℃	5 min
Denaturation	95 ℃	30 sec
Annealing	60 ℃	50 sec
Extension	72 ℃	50 sec
Final extension	72 ℃	10 min
Storage	4 ℃	10 min