Electronic Supplementary Material (ESI) for Analytical Methods.

Supporting Information for

"Detection of SARS-CoV-2 in Saliva by a Low-cost LSPR-based Sensor"

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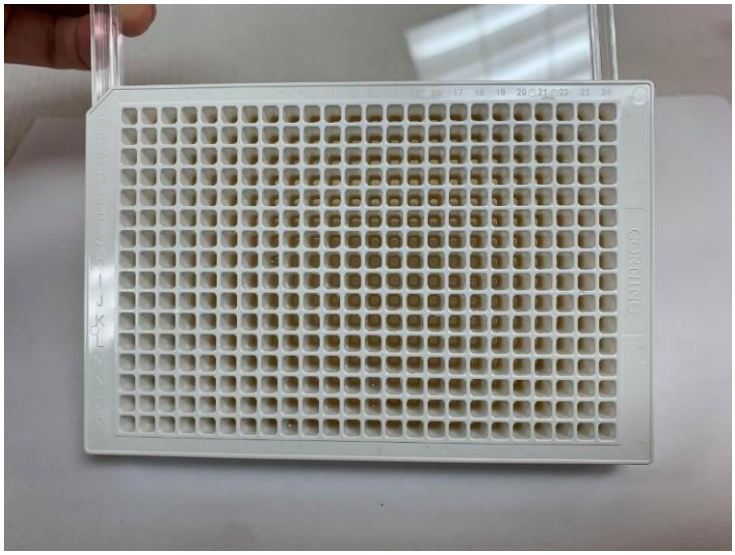

Figure S1. Photo of the sensing films (AgNPs) covering a well plate. Each plate has 364 individual wells for testing.

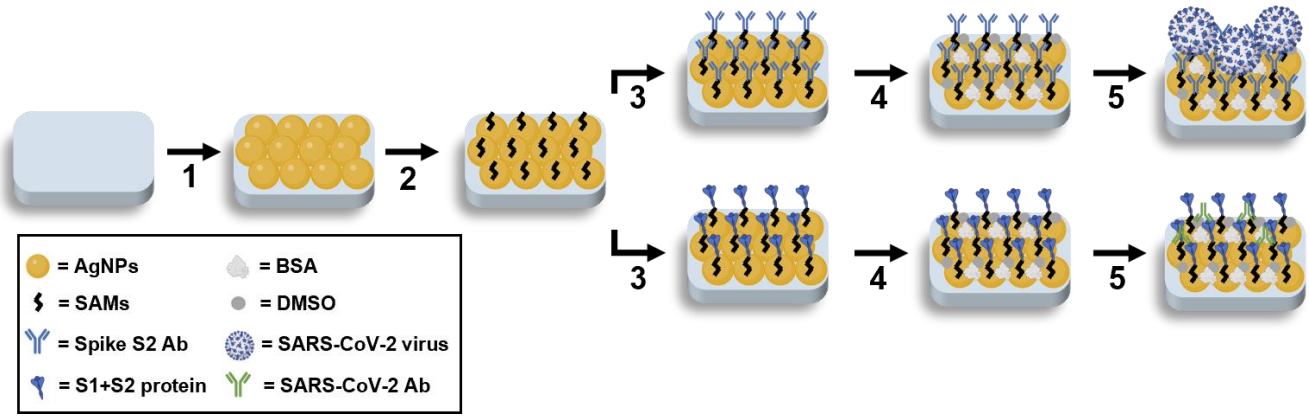

Figure S2. Layers constructed on the well plates. (1) AgNP film, (2) SAMS, (3) Spike S2 Ab or S1+S2 protein, (4) blocking with BSA and DMSO and (5) detection of the SARS-CoV-2 virus or SARS-CoV-2 Ab in saliva.

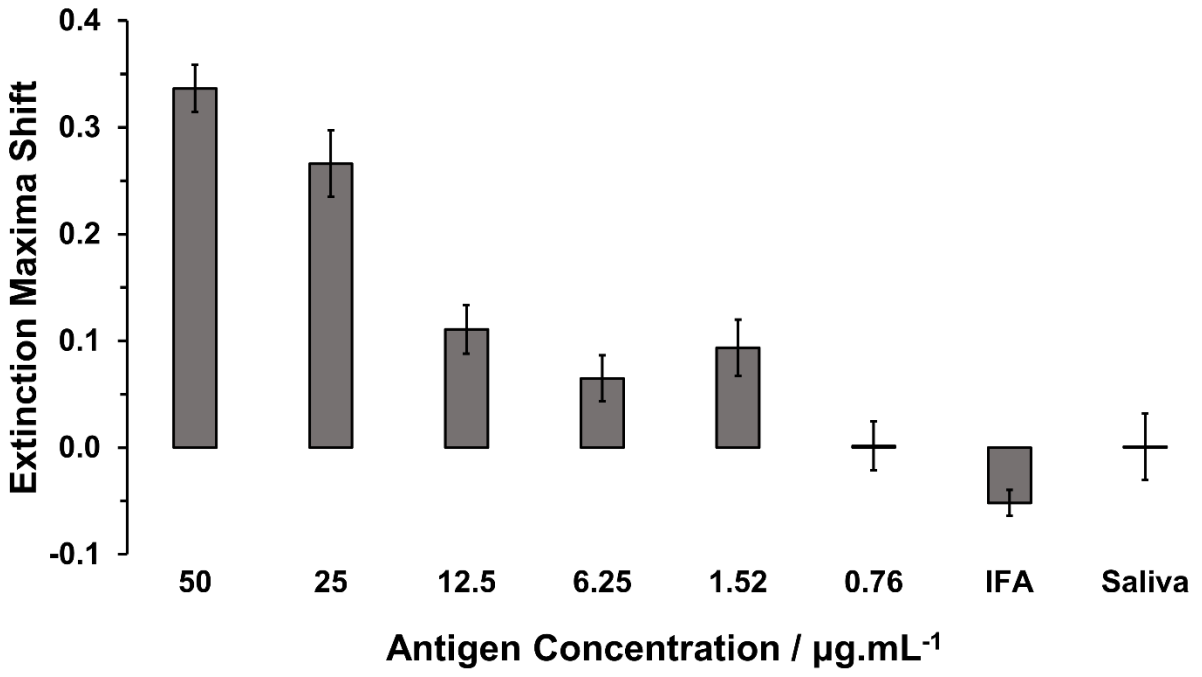

Figure S3. Assay conducted in saliva spiked with SARS-CoV-2 (2019-nCoV) Spike S1 + S2 ECD-His Recombinant Protein, with a control, IFA (Influenza A H7N9 (A/Shanghai/1/2013) Hemagglutinin / HA Protein (His Tag) and only saliva background. The detection element used in the AgNP film was Spike S2 Ab.

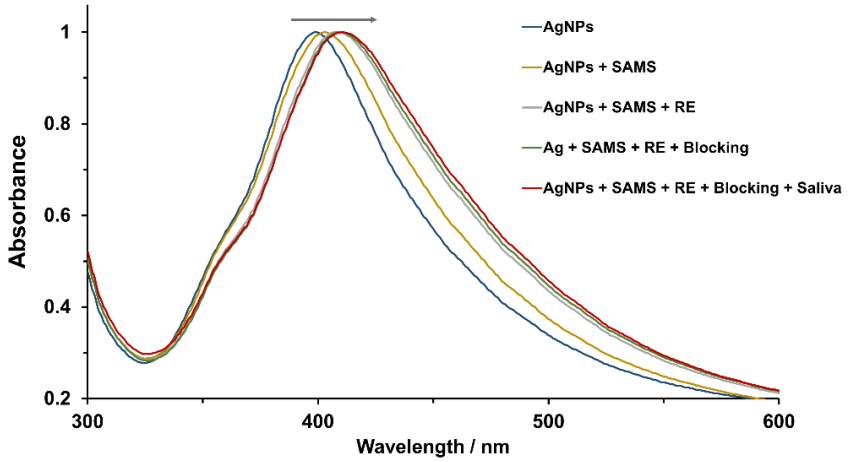

Figure S4. A shift of one well monitored and tested with a patient's saliva. Layers are AgNPs, SAMs, recognition element (RE) in this case SARS-CoV-2 (2019-nCoV) Spike S2 Antibody, blocking and saliva from the patient.

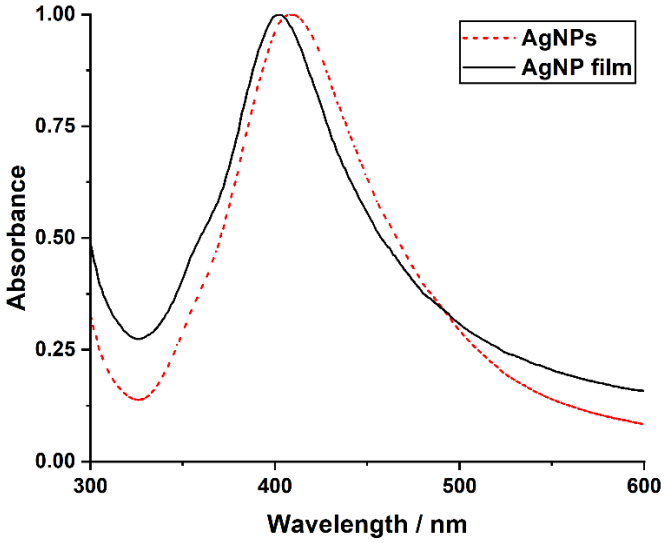

Figure S5. AgNP solution, and the formed AgNP film measured in deionized water.

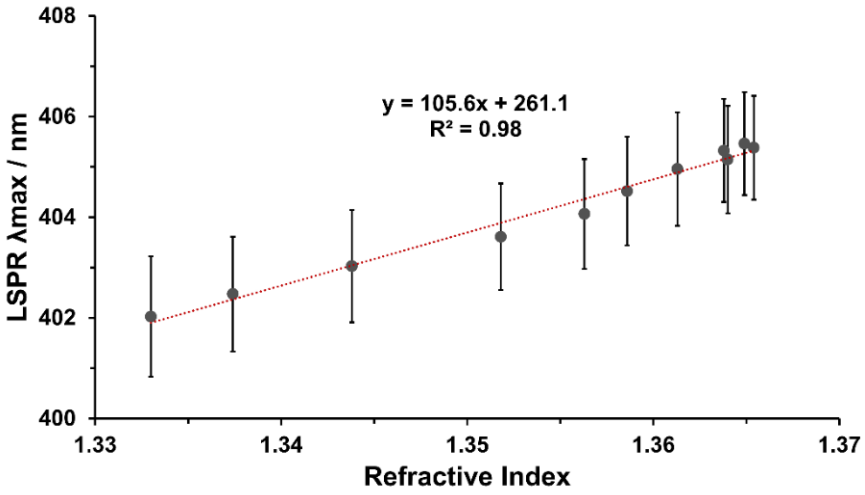

Figure S6. LSPR λmax correlation with refractive index for the Ag film in which the assay is based. The refractive index sensitivity (RIS) is 105.6 nm/RIU as denoted in the slope of the calibration curve.

To construct the ROC curves, confusion matrices were done for each possible threshold of the observed shift difference with actual and predicted “infected” and “not infected” as classifiers and determining the TRP and FRP.

Table S1. Thresholds, true positive rate (TPR) and false positive rate (FRP) calculated for the 15 confusion matrices used for the construction of the ROC curve for the sensor with Spike S2 Ab as detection element.

Virus Detection		
Threshold	TPR	FPR
>-0.30	1.00	1.00
>-0.20	0.89	1.00
>-0.13	0.78	1.00
>-0.03	0.56	1.00
>-0.01	0.44	1.00
>0.10	0.33	1.00
>0.13	0.11	1.00
>0.30	0.11	0.88
>0.50	0.11	0.75
>0.60	0.00	0.75
>0.69	0.00	0.63
>0.75	0.00	0.50
>0.82	0.00	0.38
>0.83	0.00	0.25
>1.05	0.00	0.13
>1.56	0.00	0.00

Table 2. Thresholds, true positive rate (TPR) and false positive rate (FRP) calculated for the 19 confusion matrices used for the construction of the ROC curve for the sensor with S1+S2 protein as detection element.

Antibody Detection		
Threshold	TPR	FPR
>-0.88	1.00	1.00
>-0.85	1.00	0.89
>-0.84	1.00	0.78
>-0.67	1.00	0.67
>-0.63	1.00	0.56
>-0.55	1.00	0.44
>-0.44	1.00	0.33
>-0.37	1.00	0.22
>-0.36	1.00	0.22
>-0.34	1.00	0.22
>-0.27	1.00	0.11
>-0.01	0.75	0.11
>0.20	0.63	0.11
>0.60	0.63	0.00
>0.80	0.50	0.00
>0.90	0.25	0.00
>0.93	0.25	0.00
>1.13	0.13	0.00
>1.30	0.00	0.00