

## Supporting Information

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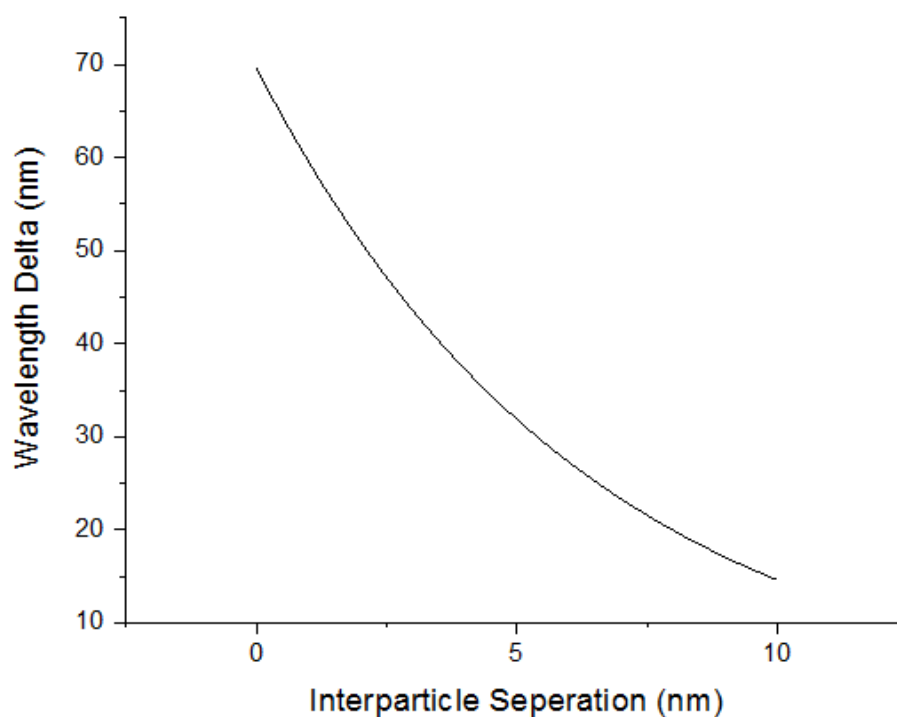
Gold Nanoparticle Enabled Localized Surface Plasmon Resonance on Unique Gold Nanomushroom Structures for On-Chip CRISPR-Cas13a Sensing

*Jacob Waitkus, Yu Chang, Li Liu, Srinivasu Valagerahally Puttaswamy, Taerin Chung, Adrian M. Molina Vargas, Stephen J. Dollery, Mitchell R. O'Connell, Haogang Cai, Gregory J. Tobin, Nikhil Bhalla,\* and Ke Du\**

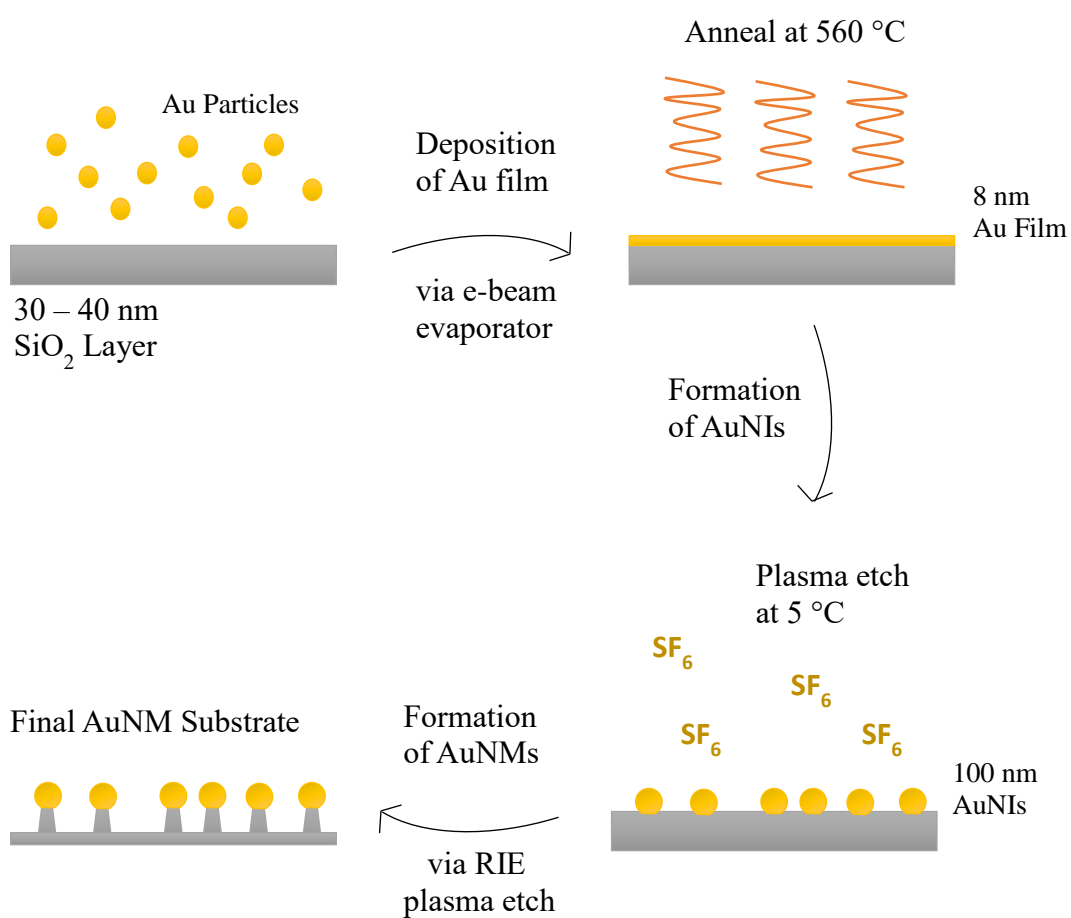
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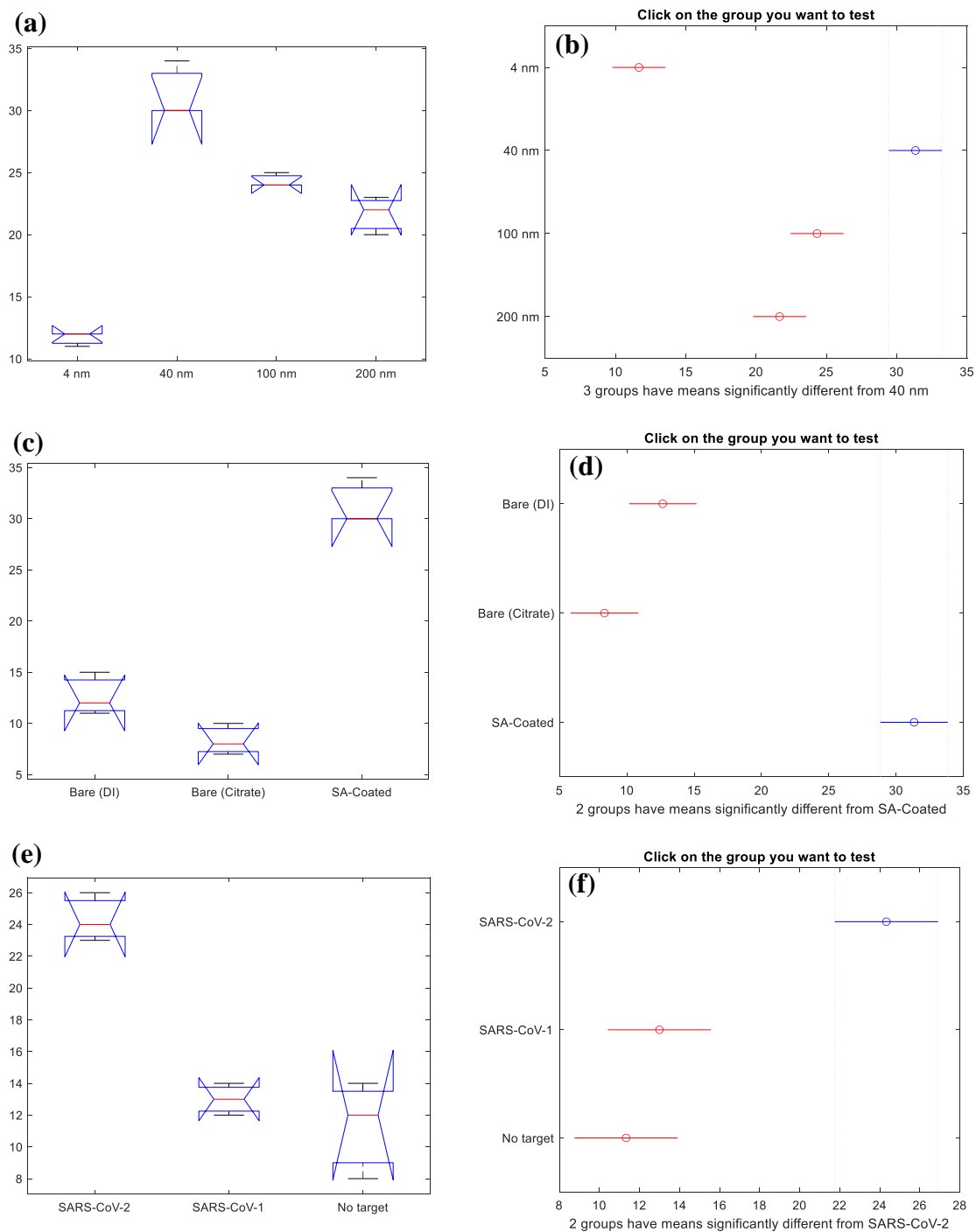
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**Figure S1.** Graph obtained using the plasmonic ruler equation, adapted for AuNP-AuNM couplings to demonstrate the interparticle separation theorized for the experimental wavelength delta gathered.



**Figure S2.** Detailed 2D image for the fabrication of the AuNM substrate<sup>7</sup>.



**Figure S3.** One-way ANOVA analysis for assessing the statistical significance for various experiments. Shown in both box plots and line graphs, the effects of (a, b) diameter and (c, d) AuNP coating, as well as the results from the (e, f) CRISPR-Cas13a testing. For each test the sample size (n) is equal to 3, and a P value less than 0.05 was used to measure statistical difference between experiments.

**Table S1.** Target RNA, crRNA, RNA reporter sequence

Name	Sequence	Sources
Fragment of plasmids pUC57-SARS-CoV-2	UU AUGUCCUU CCCUCAGUCA GCACCUCAUG GUGUAGUCUU CUUGCAUGUG ACUUAUGUCC CUGCACAAGA AAAGAACUUC ACAACUGCUC CUGCCAUUUG UCAUGAUGGA AAAGCACACU UCCUCGUGA AGGUGUCUUU GUUCAA AUG GCACACACUG GUUUGUACA CAAAGGAAU UUAUGAACC ACAAUCAU ACUACAGACA ACACAUUUGU GUCUGGUAAC UGUGAUGUUG UAAUAGGAAU UGUCAACAAC ACAGUUUAUG AUCCUUUGCA ACCUGAAUUA GACUCAUUCA AGGAGGAGUU AGAUAAAU UUUAAGAAUC AUACAUCACC AGAUGUUGAU UUAGGUGACA UCUCUGGCAU UAAUGCUUCA GUUGUAAACA UCAAAAAGA AAUUGACCGC CUCAAUGAGG UUGCCAAGAA UUUAAAUGAA UCUCUCAUG AUCUCCAAGA ACUUGGAAAG UAUGAGCAGU AUUAAAAUG GCCAUGGUAC AUUUGGCUAG GUUUUAUAGC UGGCUUGAUU GCCAUAGUAA UGGUGACAAU UAUGCUUUGC UGUAUGACCA GUUGCUGUAG UUGUCUCAAG GGCUGUUGU CUUGUGGAUC CUGCUGCAA UUUGAUGAAG ACGACUCUGA GCCAGUGCUC AAAGGAGUCA AAUUACA UUA CACAUAAACG AACUUAUGGA UUUGUUUAUG AGA	T7 run-off transcript
Fragment of plasmids pUC57-SARS-CoV-1	UUGUGUUUAA UGGCACUUCU UGGUUUAUUA CACAGAGGAA CUUCUUUUCU CCACAAAUAA UUACUACAGA CAAUACA UUU GUCUCAGGAA AUUGUGAUGU CGUUAUUGGC AUCAUUAACA ACACAGUUUA UGAUCCUCUG CAACCUGAGC UUGACUCAU CAAAGAAGAG CUGGACAAGU ACUUCAAAAA UCAUACAUCA CCAGAUGUUG AUCUUGGCGA CAUUCAGGC AUUAACGCUU CUGUCGUCAA CAUUCAAAAA GAAAUUGACC GCCUCAUUGA GGUCGCUAAA AAUUUAAAUG AAUCACUCAU UGACCUUCA GAAUUGGGAA AAUAUGAGCA AUUAUUAAA UGGCCUUGGU AUGUUUGGCU CGGCUUCAU GCUGGACUAA UUGCCAUCGU CAUGGUUACA AUCUUGCUU GUUGCAUGAC UAGUUGUUGC AGUUGCCUCA AGGGUGCAUG CUCUUGUGGU UCUUGCUGCA AGUUUGAUGA GGAUGACUCU GAGCCAGUUC UCAAGGGUGU CAAUUACA UACACAUAAA CGAACUUAUG GAUUUGUUUA UGAGAUUUUU UACUCUAGA UCAAUACUG CACAGCCAGU AAAAUUGAC AAUGCUUCUC CUGCAAGUAC UGUUCAUGCU ACAGCAACGA UACCGCUACA	T7 run-off transcript
crRNA	GACCACCCCAAAAUGAAGGGGACUAAAACgccagagaugucaccuaau	IDT
RNA reporter	/56-FAM/rUrUrUrU/3BioTEG/	IDT

**Table S2.** One-way ANOVA analysis tables for experiments on (a) diameter, (b) coating, and (c) CRISPR-Cas13a testing.

<b>(a) ANOVA Table</b>					
Source	SS	df	MS	F	Prob>F
Columns	597.583	3	199.194	95.61	1.31931e-06
Error	16.667	8	2.083		
Total	614.25	11			

<b>(b) ANOVA Table</b>					
Source	SS	df	MS	F	Prob>F
Columns	762.889	2	381.444	127.15	1.22476e-05
Error	18	6	3		
Total	780.889	8			

<b>(c) ANOVA Table</b>					
Source	SS	df	MS	F	Prob>F
Columns	300.222	2	150.111	35.55	0.0005
Error	25.333	6	4.222		
Total	325.556	8			