

Supporting Information

DNA Bioassay-on-Chip using SERS Detection for Dengue Diagnosis

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SERS Enhancement of Nanowave vs. Klarite

Drops (2 microliter each) of 1 mM p-mercaptobenzoic acid (pMBA) were delivered on Nanowave and Klarite substrates. SERS were measured using Renishaw Raman Microscope with 10X objective, 10% laser power (i.e., ~0.5 mW), 10s integration time, 1 accumulation. For each sample, five SERS spectra were acquired from five different spots across the area where pMBA were applied. The spectra were then background subtracted and averaged using a MATLAB program to represent the final SERS spectrum for the sample.

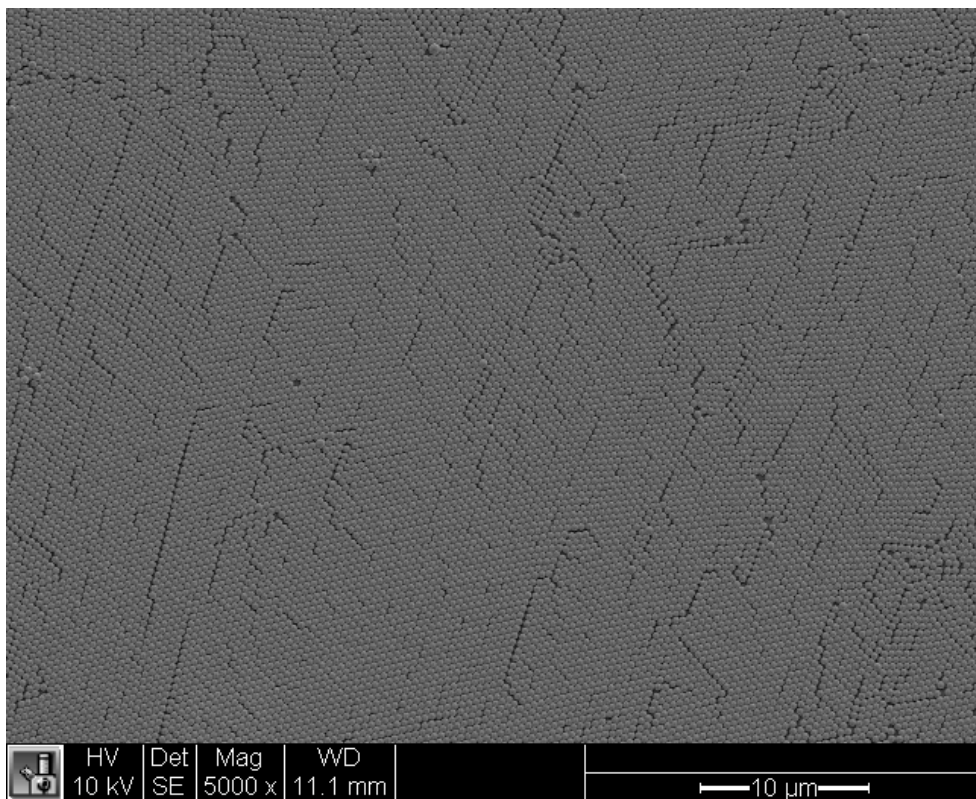


Fig. S1 SEM image of bimetallic SERS Nanowave chip fabricated using the self-assembly at water-air interface method

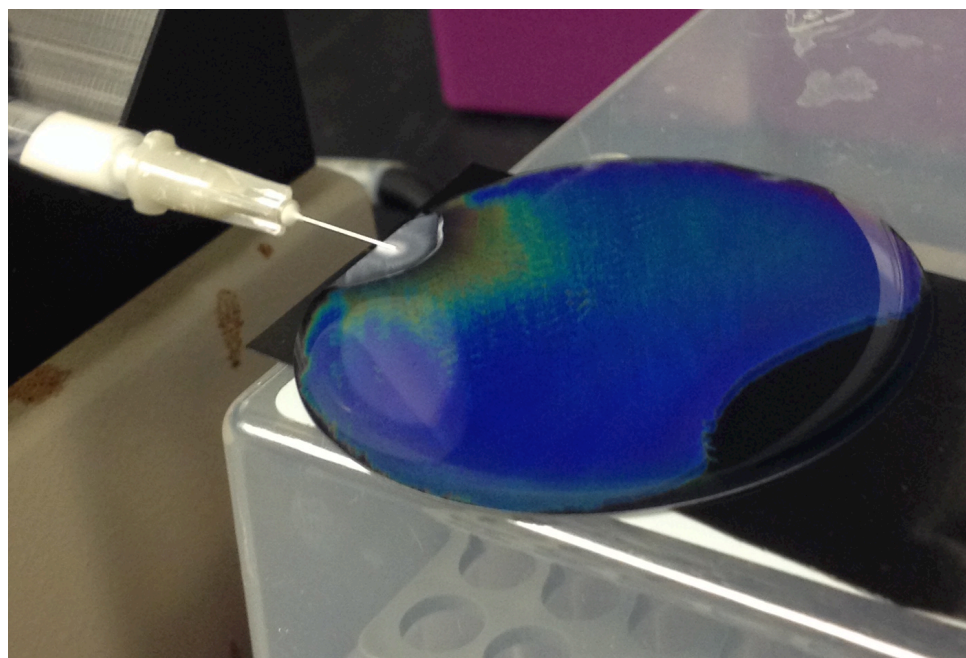


Fig. S2 Preparing a monolayer of polystyrene beads (PS) on silicon wafer by injecting mixture of PS and EtOH on a water film on the wafer.

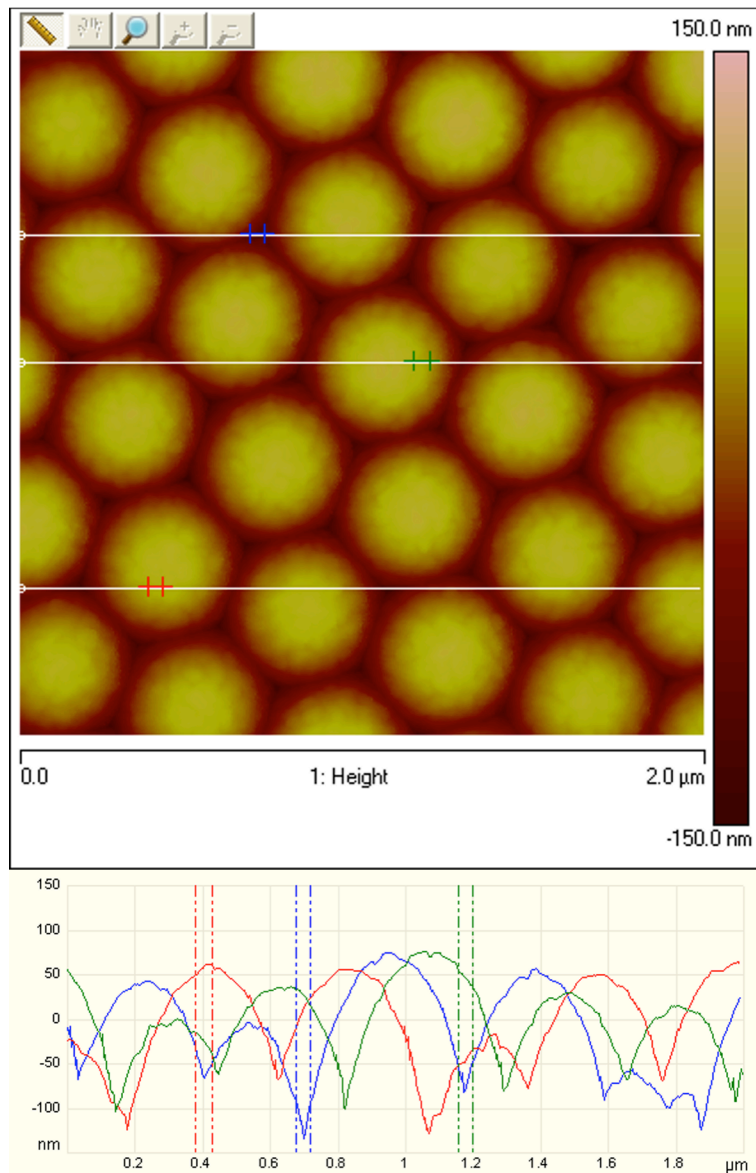


Fig. S3 AFM image and cross section profiles of bimetallic SERS Nanowave chip

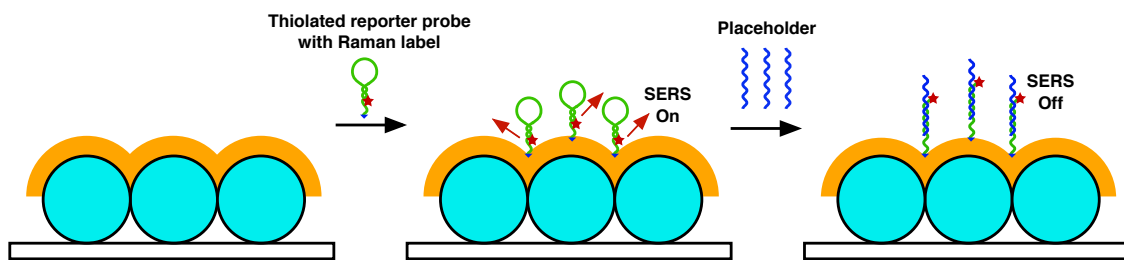


Fig. S4 Functionalization of bimetallic SERS Nanowave chip with reporter probe–placeholder partial duplexes

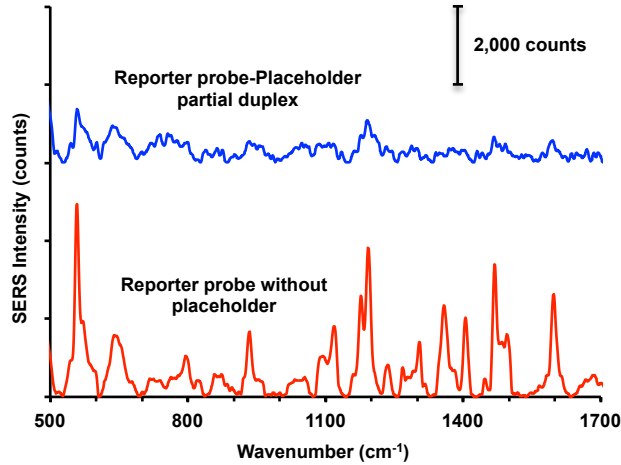


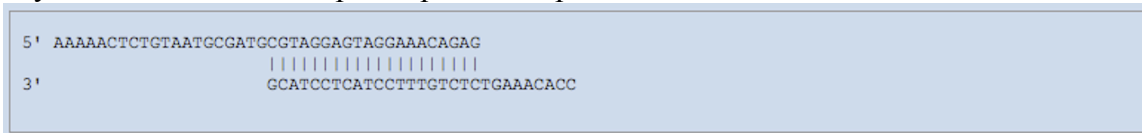
Fig. S5 SERS intensity of reporter probe with and without placeholder.

Table S1 Sequences of ssDNA used in this work (synthesized by Integrated DNA Technologies, Coralville, IA)

Name	Sequences ^a
Thiolated reporter probe	5'-SH- <u>AAAACTCTGTAATGCGATGCGTAGGAGT</u> <u>AGGAAACAGAG</u> -Cy5-3'
Placeholder	5'-CCACAAAGTCTCTGTTTCCTACTCCTACG-3'
DENV 4 complementary target ssDNA	5'-TACGGAATGCGATGCGTAGGAGTAGGAAACA GAGACTTTGTGGAAGGAGT-3'
Non-complementary ssDNA	5'-TTTGCCCCTGGCCAGGATTGCTACA GTTGTGATTGGAGGA-3'

^aThe underlined sequences indicate the complementary arms of the thiolated reporter probe

Hybridization between reporter probe and placeholder



Hybridization between DENV 4 complementary target and placeholder

