NANO-PHOTONIC TECHNOLOGIES FOR BIOIMAGING & SENSING

Nano Materials for Bio-Optical Sensing Group
National Taiwan University
Assoc. Prof. Kien Voon Kong (kvkong@ntu.edu.tw)

FOCUS

▪Novel optical imaging solutions to specific biological problems in Cancer, Metabolic Medicine, Fat metabolism & Neurodegenerative Diseases

CAPABILITIES

▪ Surface Enhanced Raman Spectroscopy & Imaging
▪Multi-Spectral Optoacoustic Tomography
▪Surface Plasmon Resonance Imaging and Spectroscopy

WHY OPTICAL IMAGING & BIOSENSING?

▪Boosts imaging resolutions in *in vivo* applications, leading to 3D imaging, quantification & ultrasensitive biosensing

SURFACE ENHANCED RAMAN SCATTERING SPECTROSCOPY FOR 前瞻奈米
To DEVELOP A "TOTAL SOLUTION" APPROACH FOR BIOSENSING

SERS CHIP MASS PRODUCTION

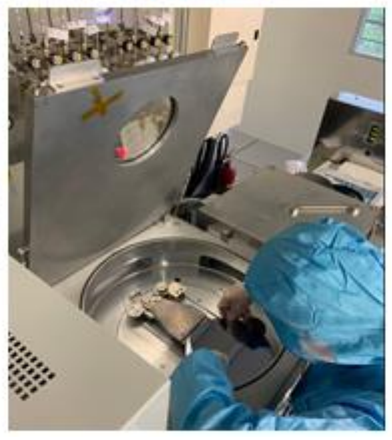
4-inch wafer silicon wafer

Cleaning

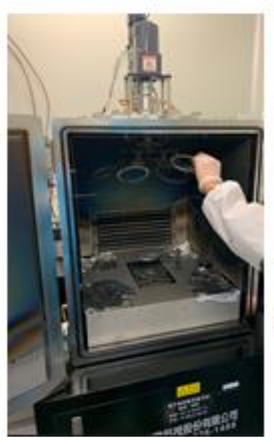
Advanced Silicon Etcher
Si reactive ion etching (RIE) Etching

After etching

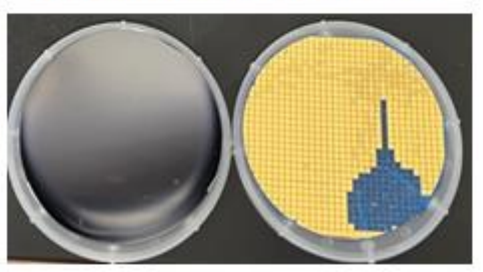
Oxygen Plasma Treatment



Electron Beam Evaporation of Cr and Au

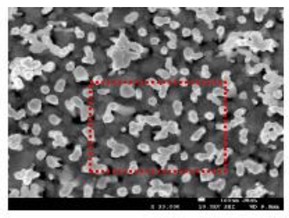


After dicing to 0.3 x 0.3 cm

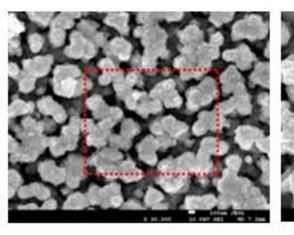


Product ready for QC SERS Test

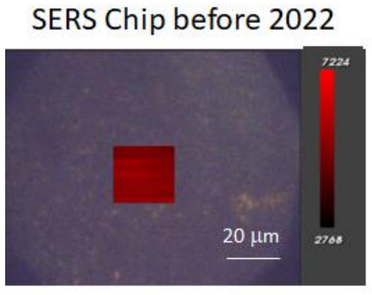
NANO SCALE ANALYSIS



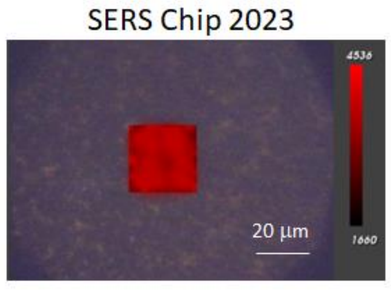
SERS Chip 2023



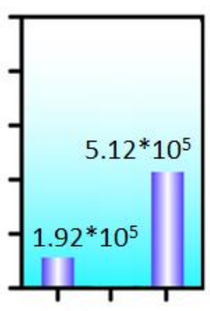
SERS Chip before 2022



SERS Chip 2023

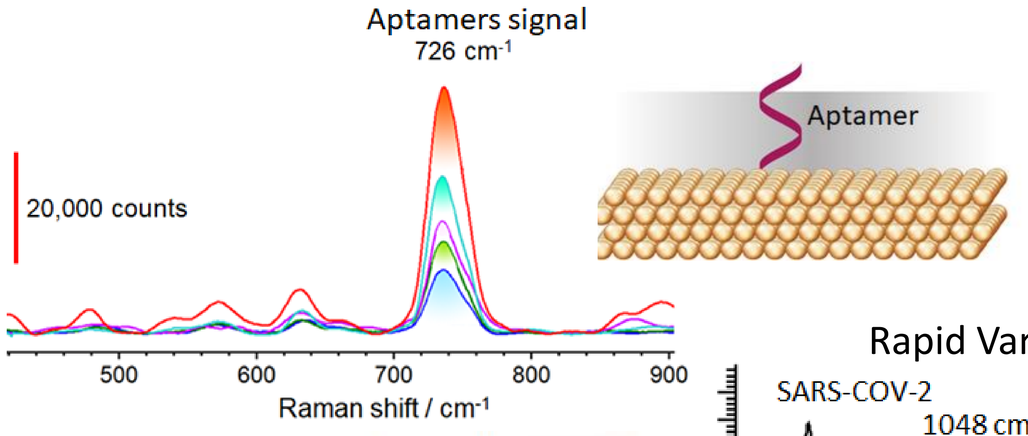


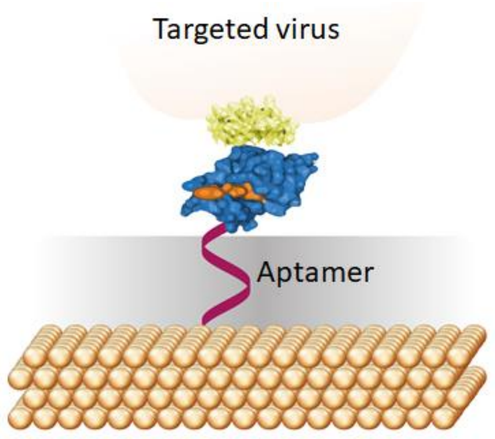
Consistency

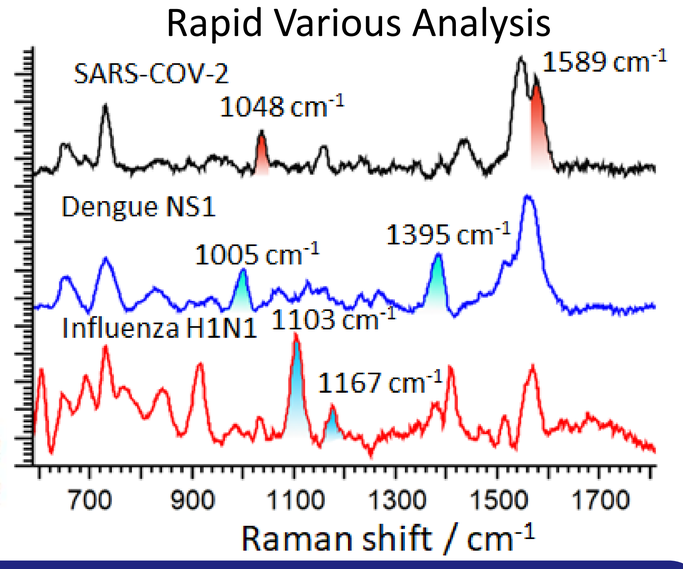


Enhancement Factor

INTEGRATION OF SERS CHIP FOR BIOSENSING



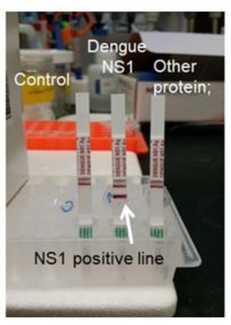


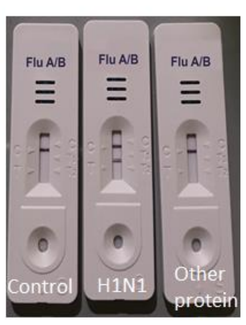


NANO SCALE ANALYSIS

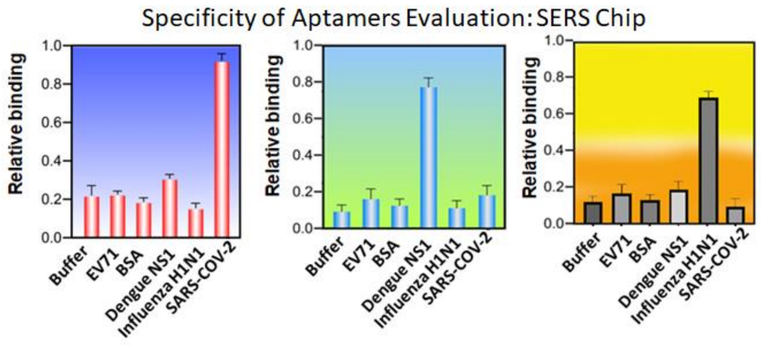
FUTURE WORKS

Specificity of Aptamers Evaluation: Commercial Kits

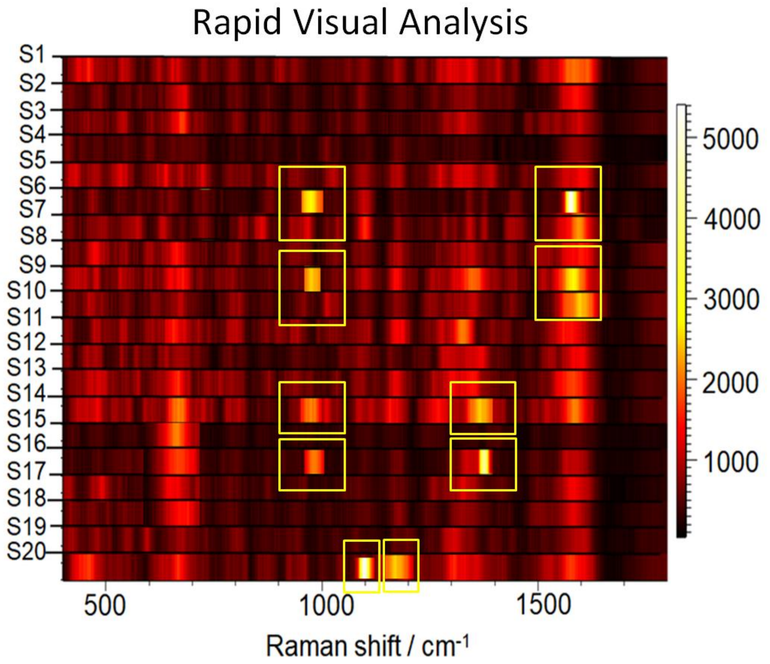




Specificity of Aptamers Evaluation: SERS Chip



Rapid Visual Analysis



SARS-COV-2: S6 and S9
Dengue NS1: S14 and S16
Influenza H1N1: S20