

**CONVENIENT HANDY RAMAN  
OPTIMUM IN YOUR LABORATORY**

**Portable Raman System  
GMD 、 GMD Probe 、 GMDX  
SERS CHIP 3D-RCW**



# GMD、GMDc、GMDX、GMDXc Portable Raman System

## INTRODUCTION

**GMD** is a portable macro Raman system. The compact size is easy for you to take it from the lab to the field. Vertical or horizontal measuring mode can be changed easily, which makes the **GMD** more flexible.

**GMD** is high quality Raman system includes focus optics, laser temperature stabilizer and high performance CCD detector.

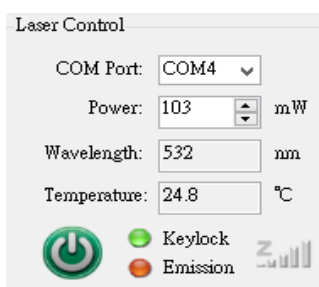


**GMDX** is micro Raman/PL system. All-in-one compact system includes XYZ three-axis sample stage, 5 M pixel CCD camera, 10X lens. Customers can change different magnifications of objective by yourself.

**GMDX** can choose different laser wavelengths according to different applications. It could be micro Raman or micro PL, for example, 535~1100nm PL or 79 ~3500  $\text{cm}^{-1}$  @532 nm laser. The spot of laser on sample should be 0.3 mm.

**GMDX** and **GMD** share the optical modules, so **GMD** can also be upgraded to **GMDX** micro-Raman system.

**GMDc / GMDXc** incorporates special cooling CCD systems that permits continuous operation without thermal noise, it could be provided to many advantages features as high stability, high sensitivity, high-speed acquisition and low noise.



Control laser power

# GMD-Probe Micro Raman System

## INTRODUCTION

**GMD Probe** is Raman Spectroscopy for multiple uses, specially designed for all kind users and could measure different kind of samples, like gem, solid, liquids, powders, thin film, paste and gel...etc.

**GMD Probe** could provide Fiber Optic Raman Probe for portable or movement application. Spectrometer is 2048 pixel. The integration time is 1  $\mu\text{m}$ ~ 600 second. Also, we provide customization, probe, which can measure the signal when touching the sample without focusing. We provide long working distance probe, high temperature probe, reaction probe for different users to chose.



## SPECIFICATION

Model: GMD、GMDX、GMD PROBE								
Excitation Source	*375 nm (PL)	*405 nm (PL)	532 nm			633 nm	785 nm	808 nm
Laser power	70mW	25 Mw	100 mW			70 mW	100 mW	120 mW
PL /nm	395~1100	420~1100	--	--	--	--	--	--
Raman shift/ cm-1	--	--	79~2000	79-3500 186~3500	150~5400	150~3500	150~3600	186~3250
***Resolution	~ 2.5nm **~ 1.5 nm	~ 2.5 nm **~ 1.5 nm	1.3 cm <sup>-1</sup>	1.8 cm <sup>-1</sup>	4.3 cm <sup>-1</sup>	1.7cm <sup>-1</sup>	1.7cm <sup>-1</sup>	1.7cm <sup>-1</sup>

\* There are no 375 nm and 405 nm providing from GMD probe.

\*\* Providing customization for ~1.5 nm resolution. (FWHM)

\*\*\* Resolution: FWHM / nm ; Pixel to Pixel / cm<sup>-1</sup>

# SERS CHIP 3D-RCW

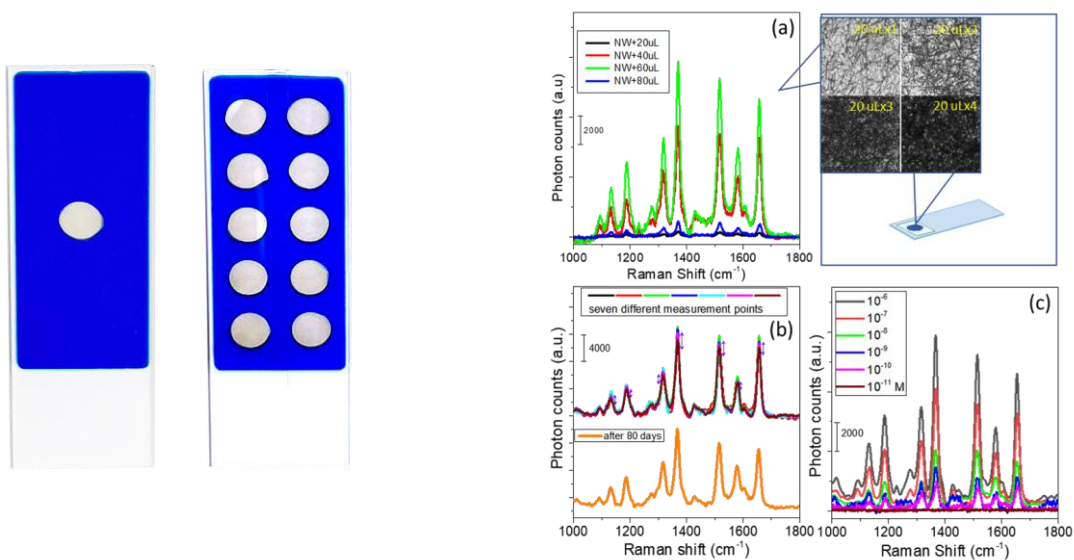
## 3D Random Crossed-Wire SERS chip

### INTRODUCTION

PTT launches a 3D nanostructures sers chip, Silver nanowire 3D random crossed-wire woodpile (**3D-RCW**) nanostructures were designed and prepared. The 3D-RCW provides rich “antenna” and “hot spot” effects that are responsive for surface-enhanced Raman scattering (SERS) effects and plasmon-enhanced fluorescence (PEF). It also has obtained a Taiwan patent (I750718) and a U.S patent (100573-US-PA) (U.S. patent is still applying now.)

**RCW** is very sensitive nanochip capable of emission and Raman-enhanced detections uses micro levels of analysis volumes. Consequently, and SERS of pesticides (thiram, carbaryl, paraquat, fipronil) were successfully measured and characterized, and their detection limits were within 5  $\mu\text{M}$ ~0.05  $\mu\text{M}$  in 20  $\mu\text{L}$ .

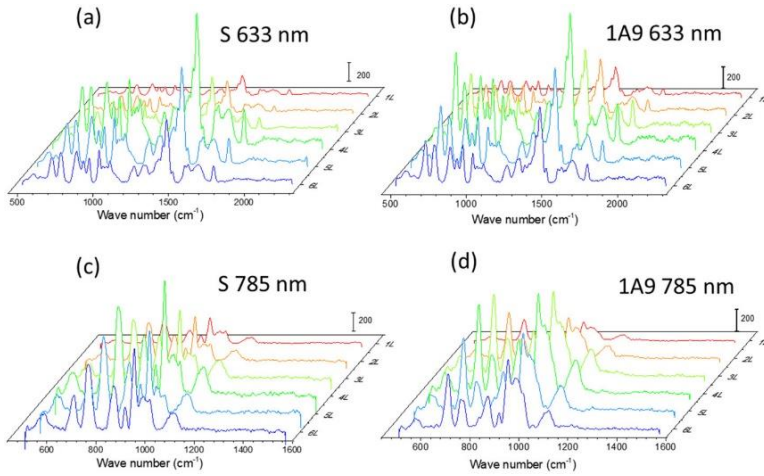
**3D-RCW SERS chip** is a very sensitive substrate, one drop of sample is enough to collect Raman spectrum.



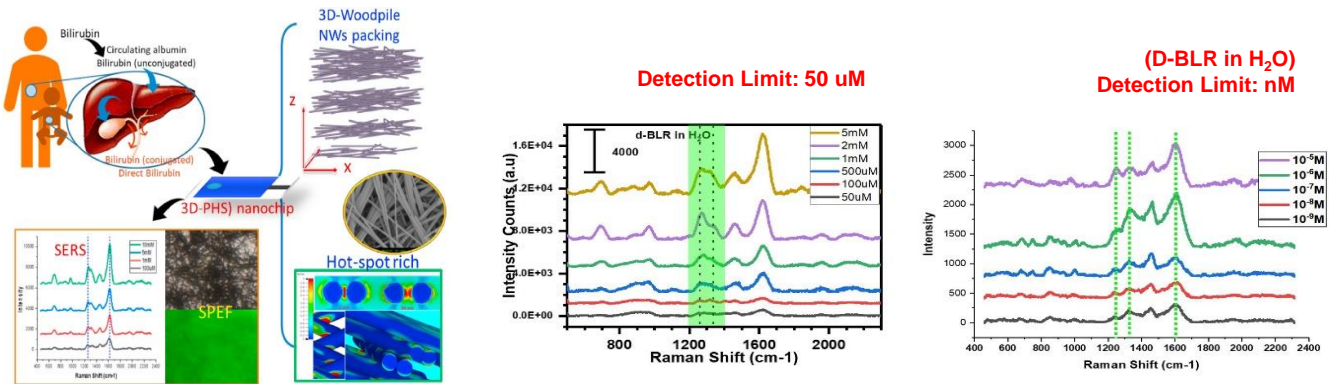
	3D-RCW-1	3D-RCW-10
Order Information	Nanostructure Chip - Material : Silver Nanowire 3D random crossed-wire woodpile - Active area : round 5mm - 1 test / set	Nanostructure Chip - Material : Silver Nanowire 3D random crossed-wire woodpile - Active area : round 5mm - 10 test / set

# APPLICATION

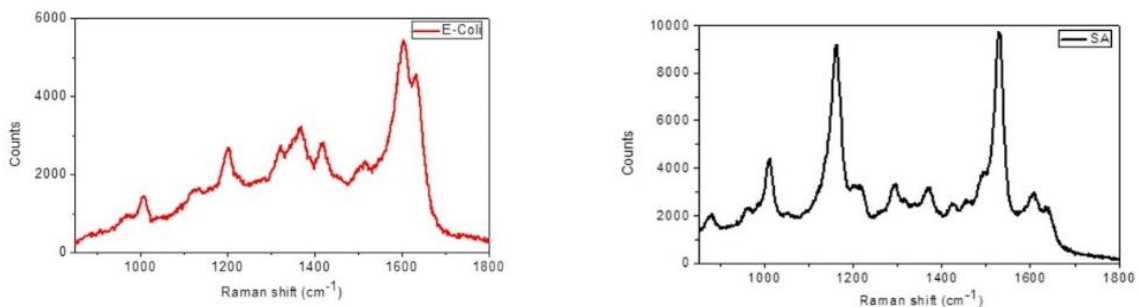
## SARS-Cov-2 S-protein vs Antibody 1A9-protein



## D- bilirubin LOD : $10^{-9}$ M



## Microorganism application - E-Coli & S.aureus



### Reference:

\*\*Appl. Phys. Rev. 10, 041403 (2023); doi: 10.1063/5.0155256

\*\*Biosensors and Bioelectronics Volume 213, 1 October 2022, 114440



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