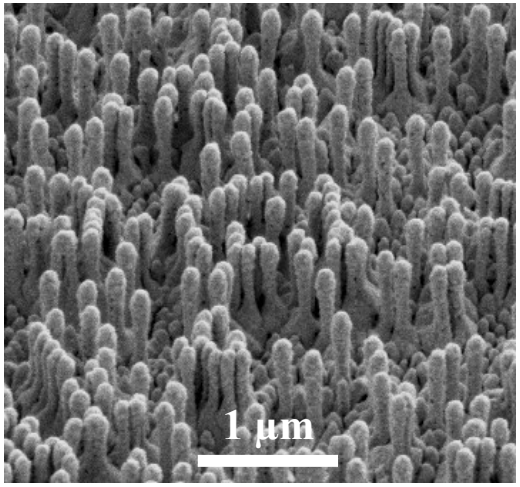
High efficiency, reproducible and uniform SERS platforms based on GaN technology

Specification:

1. Standard dimension of SERS platform: 5 x 5 x 0.4 mm (active area 4 x 5 mm). Other size possible on demand;
2. Surface morphology: individual pillars or bunches of pillars (see SEM images below);
3. Nobel metal coating: gold or Au/Ag = 70/30 wt% alloy. De-alloying for increased nano-scale roughness possible on demand (see ref. 2);
4. Raman signal intensity enhancement (SERS-EF) factor in the range 10^4 – 10^7 depending on the type of molecules and platform configuration. Very uniform EF on the whole platform;
5. Analysis of analytes at low concentration in a liquid or solid deposits;
6. Long time stability of delivered SERS platforms (up to 90 days);
7. Possible collaboration with a customer for optimal configuration of SERS platform for specific analyte/molecule;

References:

1. A Kamińska et al., "Highly reproducible, stable and multiply-regenerated Surface-Enhanced Raman Scattering substrate for biomedical applications", J. Mat. Chem. 21 (2011) 8662;
2. J. L. Weyher et al., "GaN-based platforms with Au-Ag alloyed metal layer for surface enhanced Raman scattering", J. Appl. Phys., 112, 114327 (2012);
3. A. Kamińska et al.,"Detection of DNA Mutations Using Novel Surface-Enhanced Raman Spectroscopy (SERS) Diagnostic Platform", J. Chem. Chem. Eng. 7 (2013) 199-208.



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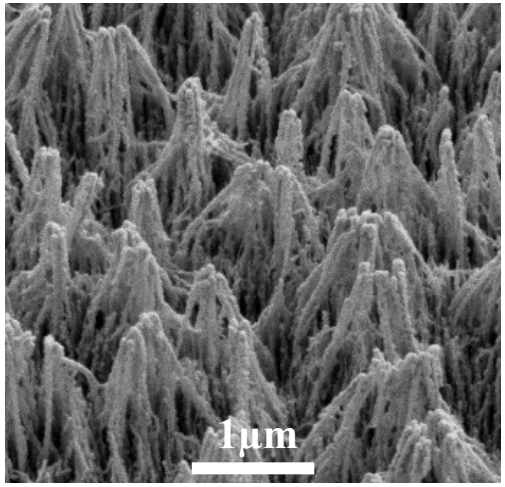

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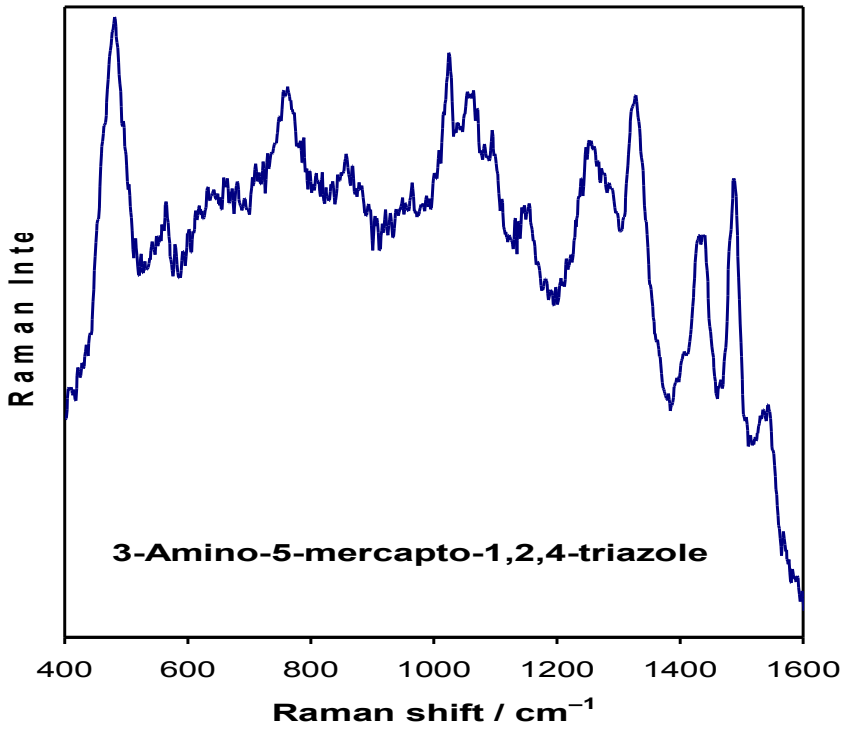
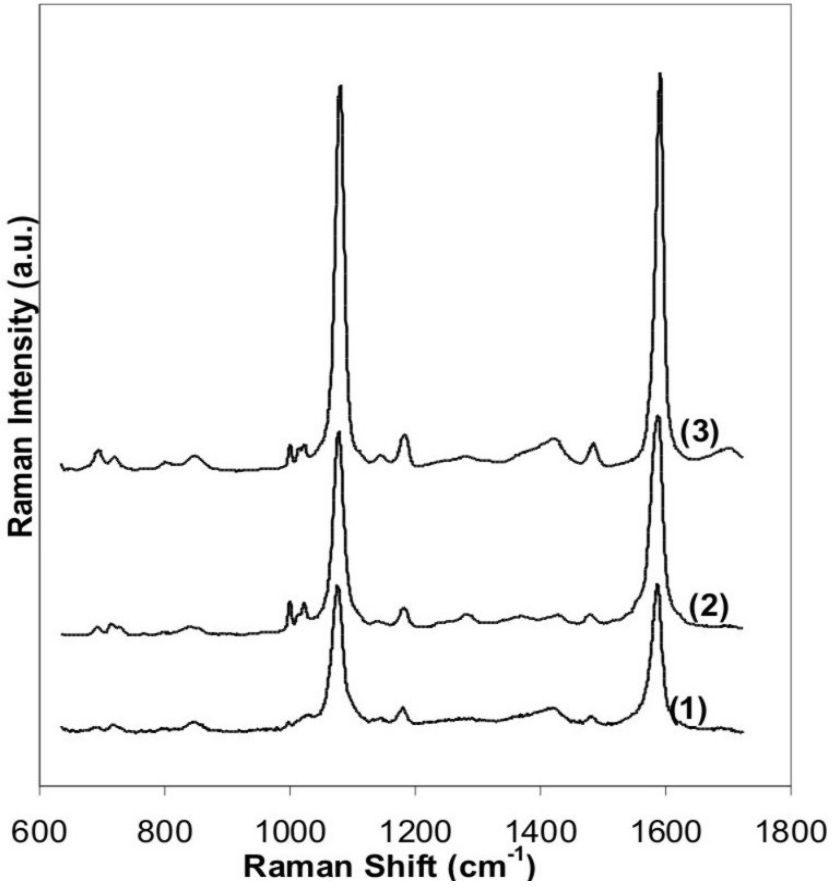
Prices:

1.	Standard GaN-based SERS platform	65 Euro
2.	3 x standard GaN-based SERS platform	180 Euro
3.	5 x standard GaN-based SERS platform	300 Euro
4.	Delivery cost:	25 Euro
	Delivery time: max. 6 weeks	

Examples of GaN-based SERS platforms performance

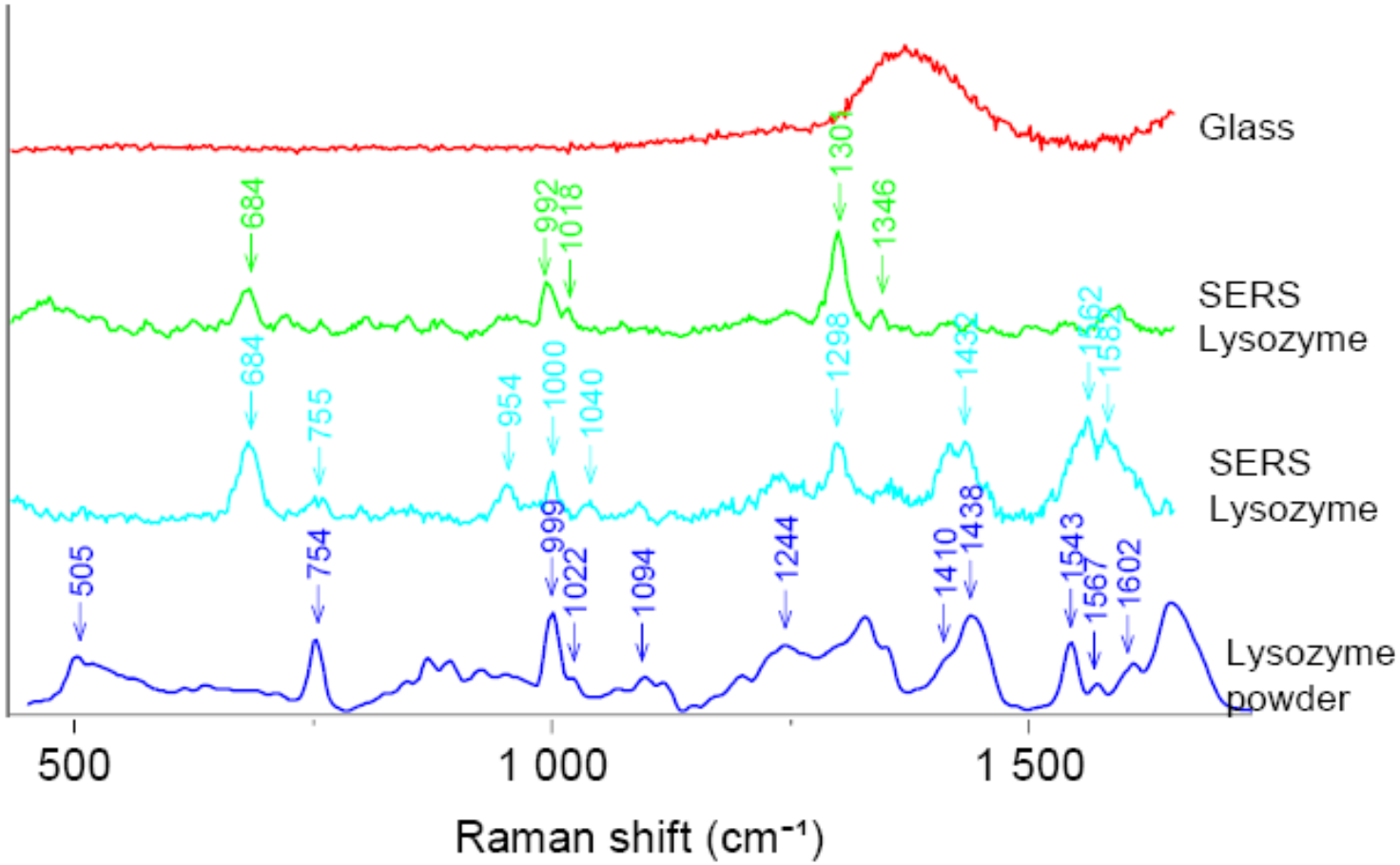
(By courtesy of Dr A. Kudelski, Dept. of Chemistry, University of Warsaw)





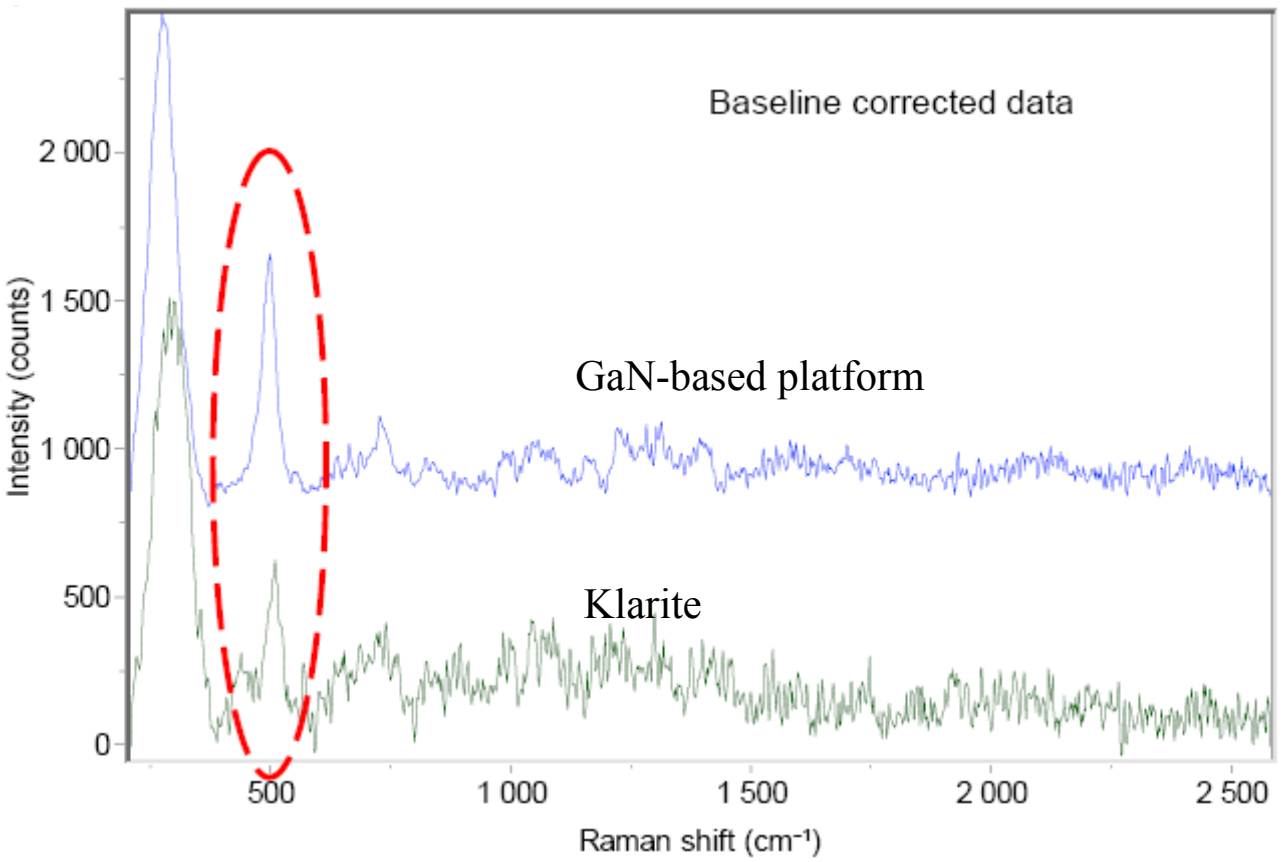
SERS spectra of *p*-MBA on GaN-based platforms covered by pure gold (1) and Au-Ag alloy (2,3). Samples 1 and 2 not etched, sample 3 de-alloyed for 24 hours (reprinted from ref. 2).

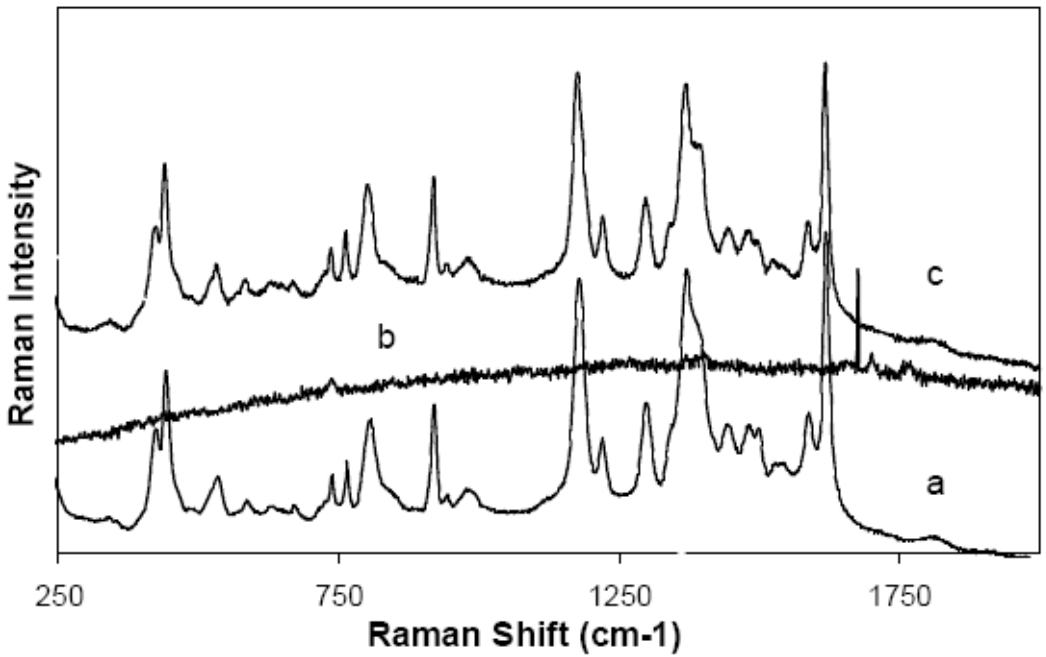
Detection of Lysozyme: two types of spectra of DNA were observed
(Laser: 785 nm, Acq time: 4s, Power: 25% = 6.25 mW)
(By courtesy of Dr C. David, Horiba Jobin-Yvon, France)



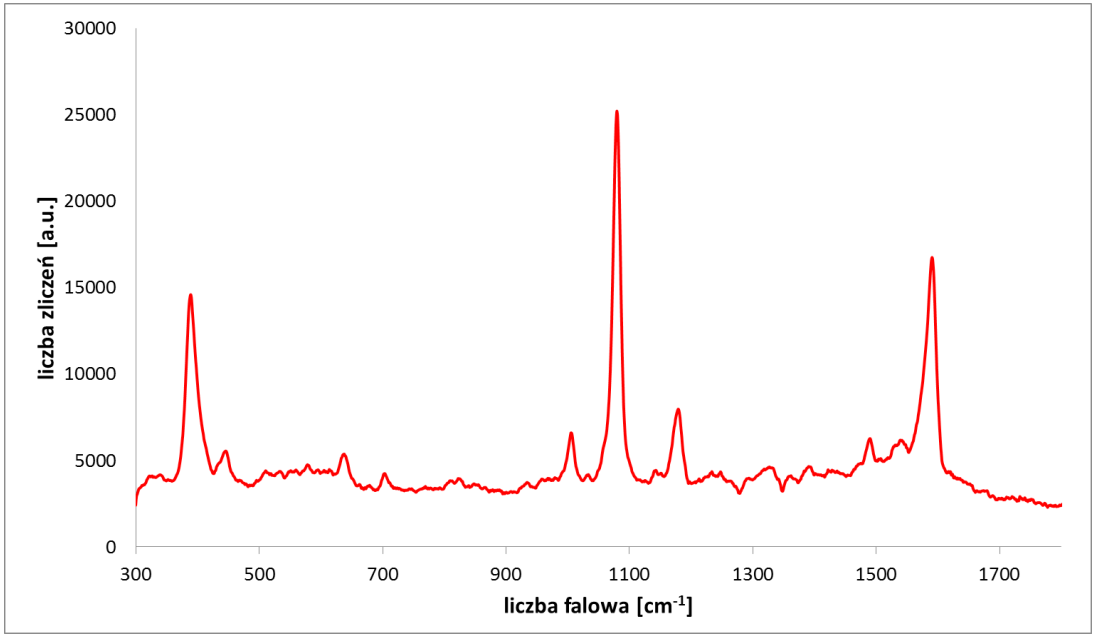
DTT SERS detection comparison: GaN-based platform vs commercial platform

(By courtesy of Dr C. David, Horiba Jobin-Yvon, France)



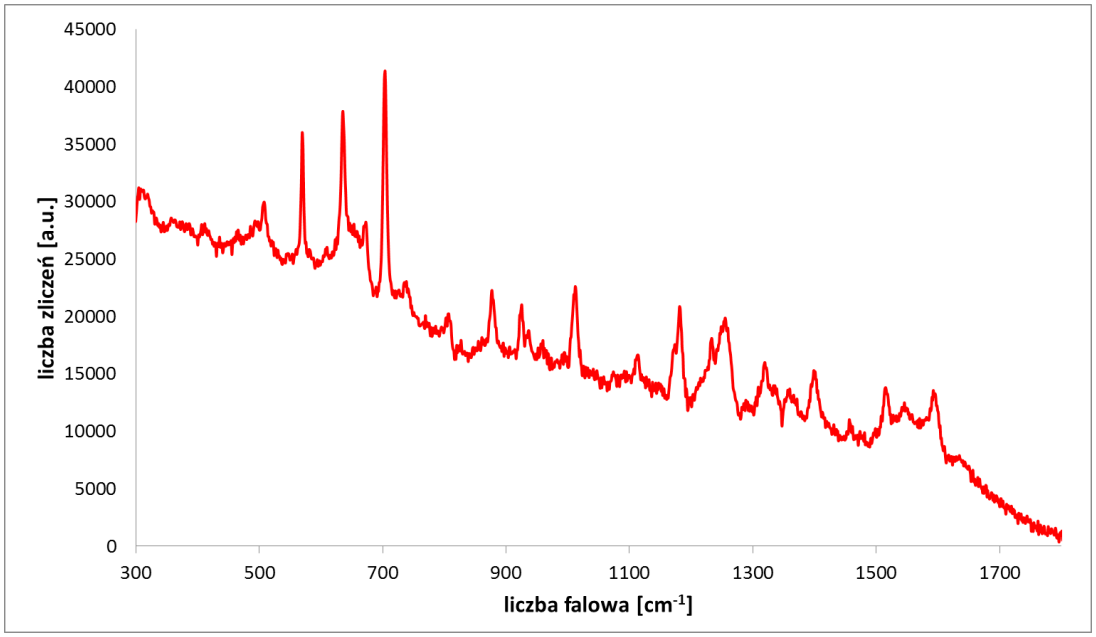


(a) SERS spectrum of MGITC adsorbed on a freshly prepared surface; (b) spectrum recorded after the cleaning procedure, and (c) SERS spectrum of MGITC adsorbed again onto a regenerated surface. (reprinted from ref. 1).

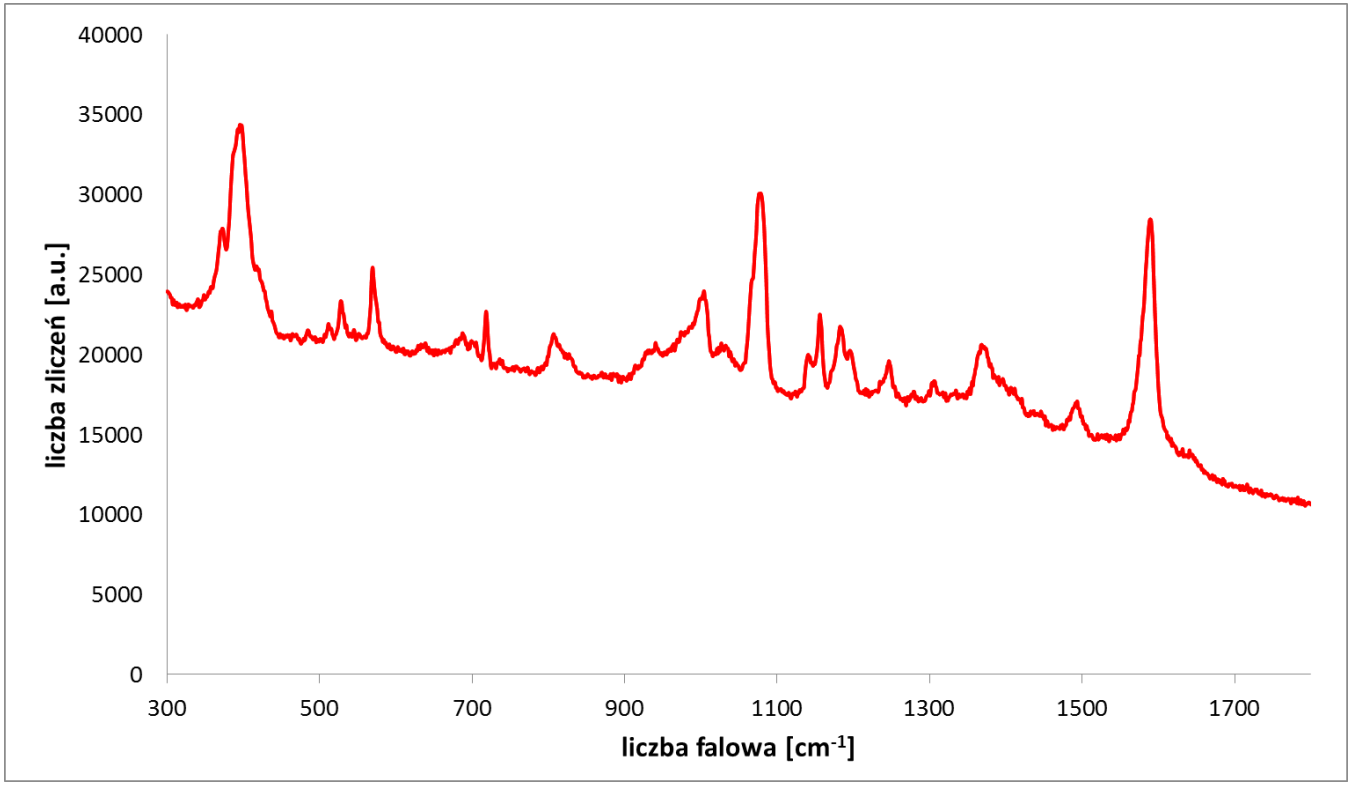


SERS spectra of pMA: laser 785 nm, laser power 0,5%, GaN-Au/Ag.
(By courtesy of Dr B. Jankiewicz WAT)

EF ~ 10^6



Raman spectra of Bacillus Thuringensis bacteria: laser 785 nm, laser power 5%, acq time 10 s.
(By courtesy of Dr B. Jankiewicz WAT)



SERS spectra of pMA: laser 785 nm, laser power 0,5%. AgPVD-GaN platform *(By courtesy of Dr B. Jankiewicz WAT).* EF ~10^8