

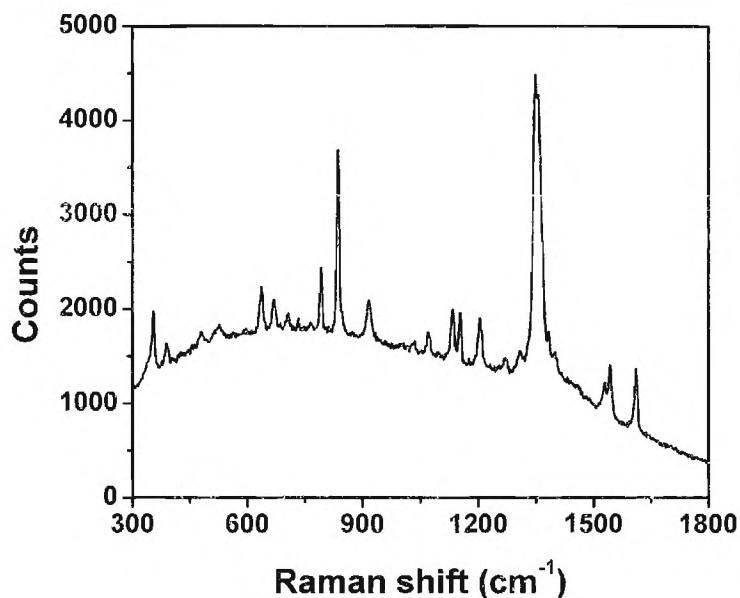
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# SERS-based DNT detection

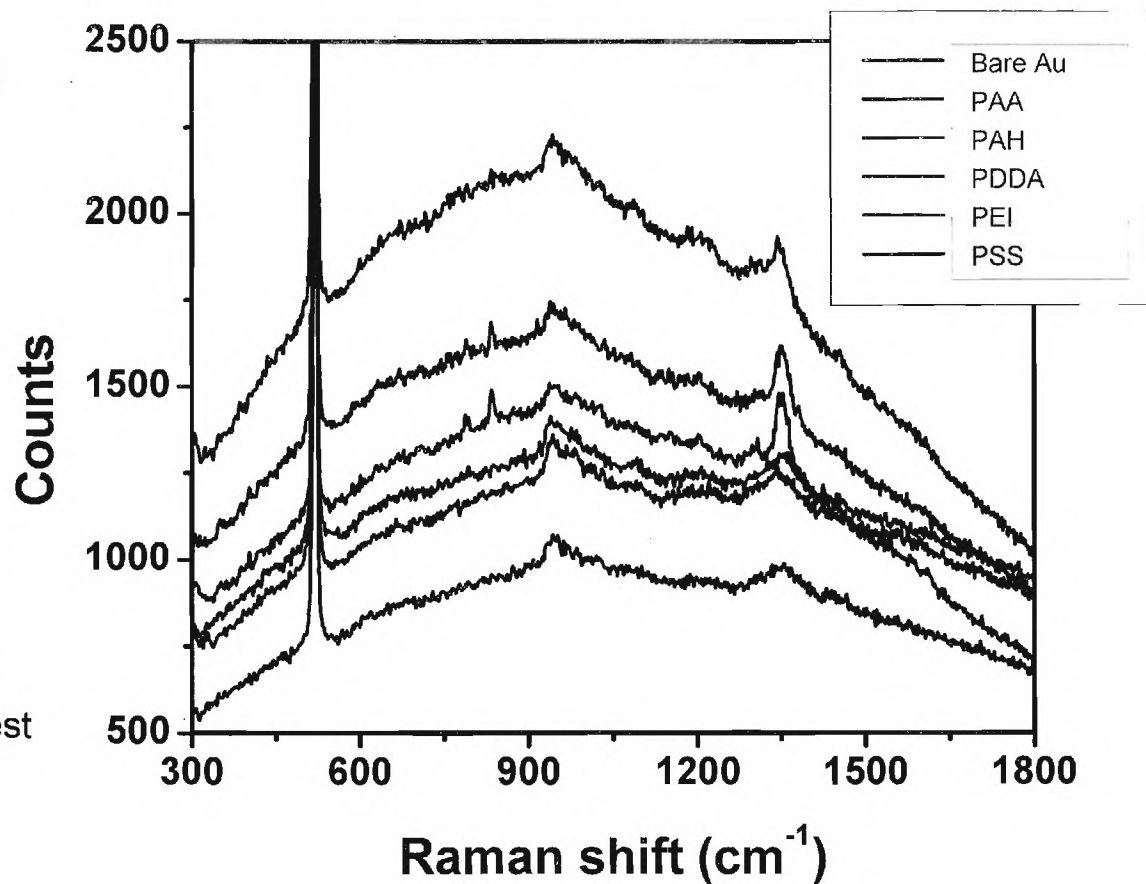
## Summary

- Raman measurement of DNT powder
- Preparation of gold nanoparticle assembly for SERS substrate
  1. Use Au assembly inside the porous alumina membrane (large surface area)
  2. Synthesis of CTAB-modified Au nanoparticles and assembly on silicon substrate
- SERS measurement of DNT in ethanol
- Surface coating of Au nanoparticles with different polyelectrolytes for receptor layer of DNT



Raman spectra of DNT powder showed typical NO<sub>2</sub> out-of-plane bending modes at 836 cm<sup>-1</sup> and the NO<sub>2</sub> stretching modes at 1348 cm<sup>-1</sup>

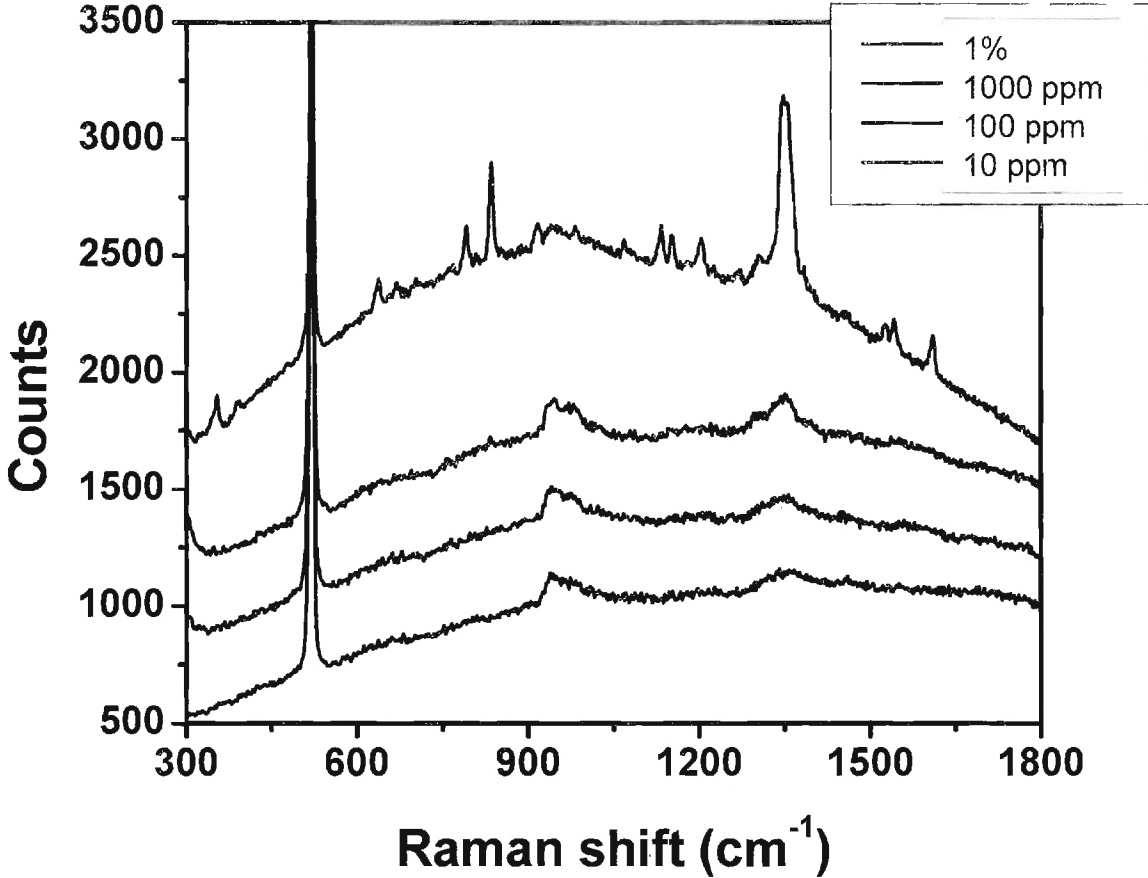
### SERS of DNT on au infiltrated alumina membrane

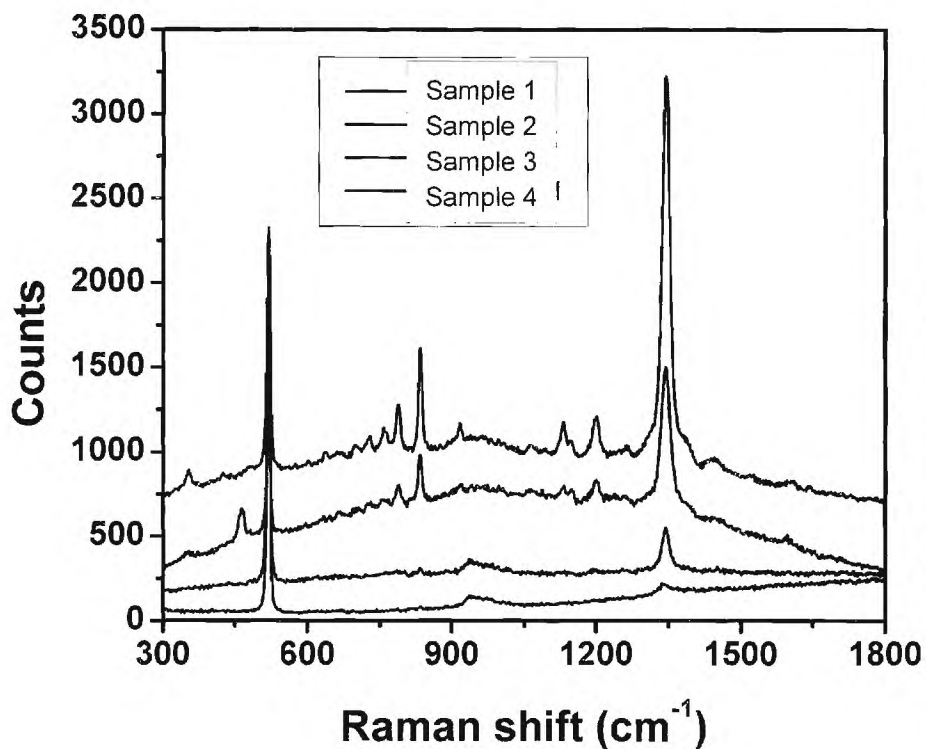


	Intensity at ~1350 cm <sup>-1</sup>
Bare Au	73
PDDA	193
PAH	158
PEI	108
PAA	93
PSS	66

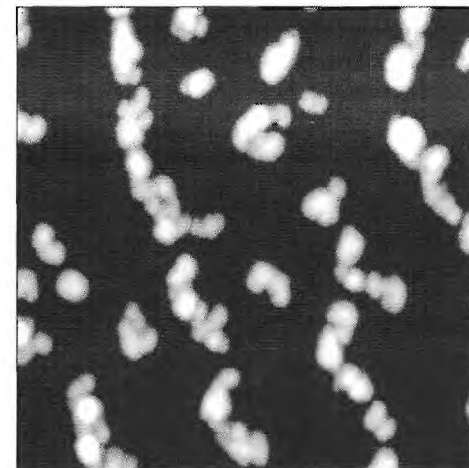
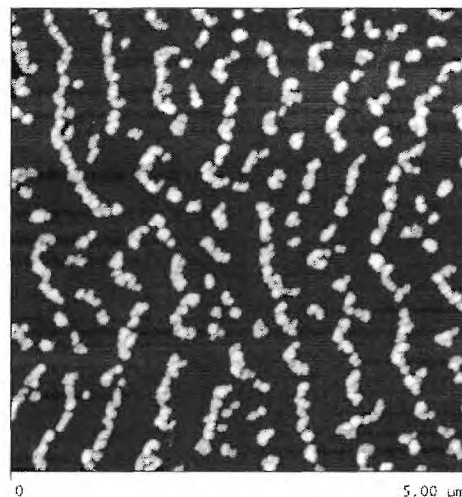
- Polyelectrolytes with amine groups are best for DNT detection
- PDDA > PAH > PEI

SERS measurement of DNT on PDDA coated Au inside the alumina membrane





One-dimensional chain-like aggregate of Au



Highly-packed Au assembly

Samples	Intensity at $\sim 1350 \text{ cm}^{-1}$
Chain-like assembly (sample 1)	49
Highly-packed assembly (sample 2)	817
PDDA coating on chain-like assembly (sample 3)	254
PDDA coating on highly-packed assembly (sample 4)	2212

