Electronic Supplementary Material (ESI) for Analyst.

Electronic Supplementary Information

Carbon nanotube/gold nanoparticle composite-coated membrane as a facile plasmon-enhanced interface for sensitive SERS sensing

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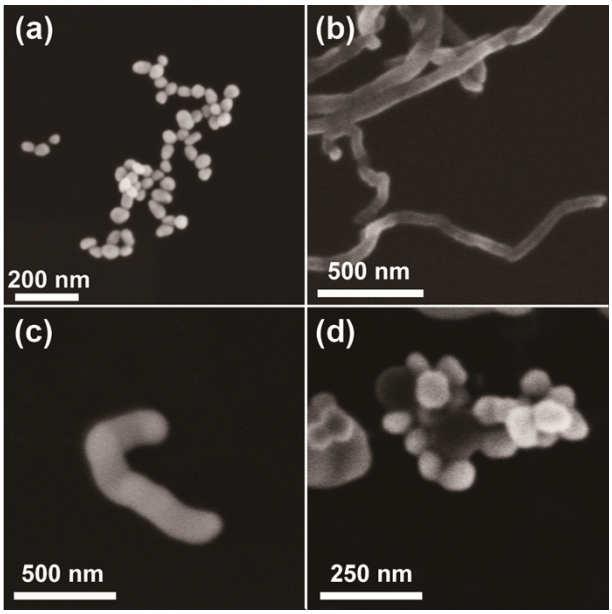

Fig. S1 SEM images showing the size distribution of Au NPs used in the experiment (a), the diameter change of CNTs before (b) and after silylation (c), and the assembly of Au NPs on CNTs.

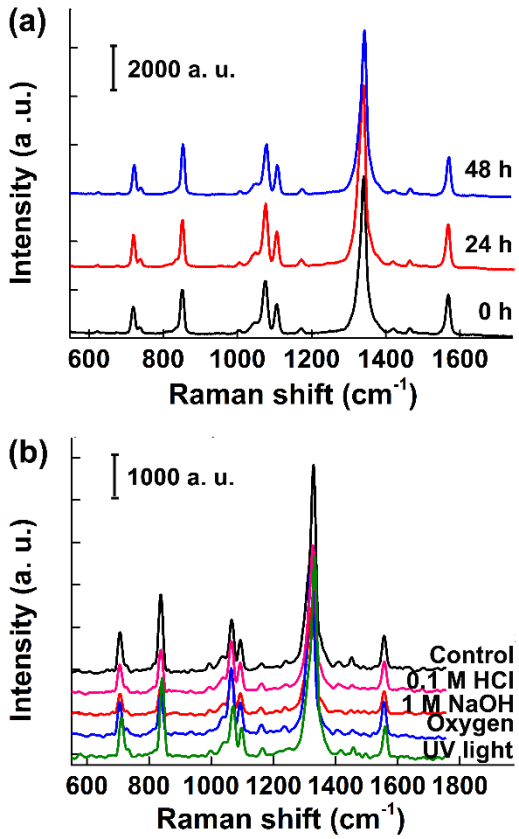

Fig. S2 SERS spectra of 4-NTP showing the stability of the membrane-based plasmonic sensors. (a) SERS signals enhanced by the membrane after it was continuously immersed in water for 0, 24, and 48 h, (b) SERS signals given by the membrane-based sensors after they were respectively exposed to 0.1 M HCl, 1 M NaOH, oxygen flow, and UV radiation for 20 min.

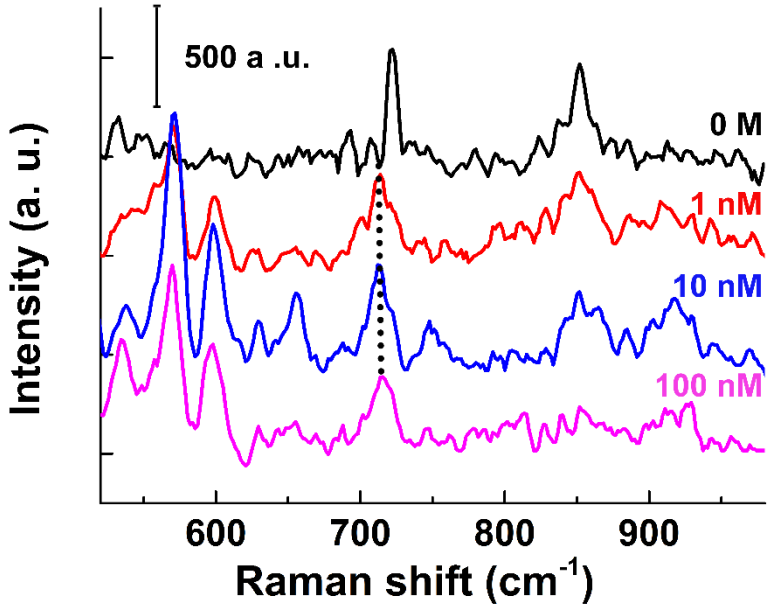

Fig. S3 SERS spectra at different concentrations of melamine in liquid milk acquired with the membrane-based sensors. A BWS415 portable Raman spectrometer (B&W TEK) with a 785 nm laser was used for the signal acquisition.

Table S1 Comparison of SERS-based methods for the detection of melamine

Method	LOD	Reference
SERS on Ag coated poly(styrene-co-acrylic acid) nanospheres	1×10^{-3} M	[S1]
SERS on magnetic-core/Au-shell nanoparticles and Au nanorods	3×10^{-6} M	[S2]
SERS on Ag nanorod arrays	7.9×10^{-7} M	[S3]
SERS on Au nanofinger chips	9.5×10^{-10} M	[S4]
SERS on Ag colloids	7.9×10^{-8} M	[S5]
SERS on Au nanoparticles	1.3×10^{-6} M	[S6]
SERS on 4-mercaptopyridine-modified Au nanoparticles	7.9×10^{-10} M	[S7]
SERS on hollow gold chips	1×10^{-9} M	[S8]
SERS on CNT/AuNP hybrids-coated filter membrane	1×10^{-9} M	This work

References

S1. J. M. Li, W. F. Ma, C. Wei, L. J. You, J. Guo, J. Hu and C. C. Wang, *Langmuir*, 2011, **27**, 14539-14544.

S2. N. N. Yazgan, I. H. Boyaci, A. Topcu and U. Tamer, *Anal. Bioanal. Chem.*, 2012, **403**, 2009-2017.

S3. X. Du, Y. Huang, and Y. Zhao, *Appl. Spectrosoc*, 2010, **64**, 781-785.

S4. A. Kim, S. J. Barcelo, R. S. Williams and Z. Li, *Anal Chem*, 2012, **84**, 9303-9309.

S5. X.-F. Zhang, M.-Q. Zou, X.-H. Qi, F. Liu, X.-H. Zhu and a. B.-H. Zhao, *J. Raman Spectrosc.*, 2010, **41**, 1655-1660

S6. A. M. Giovannozzi, F. Rolle, M. Sega, M. C. Abete, D. Marchis and A. M. Rossi, *Food Chem.*, 2014, **159**, 250-256.

S7. T. Lou, Y. Wang, J. Li, H. Peng, H. Xiong and L. Chen, *Anal. Bioanal. Chem.*, 2011, **401**, 333-338.

S8. Z. Guo, Z. Cheng, R. Li, L. Chen, H. Lv, B. Zhao and J. Choo, *Talanta*, 2014, **122**, 80-84.