Resume

Name：Lei Wu
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EDUCATION

09/2012-06/2017 **PhD**, major in Optical Engineering
Advanced Photonics Center, Southeast University, China
- Advisor: Prof. Yiping Cui
- Co-advisor: Prof. Zhuyuan Wang
- GPA 3.86/4.0

08/2008-06/2012 **B.S.**, major in Electronic Science and Engineering
School of Electronic Science and Engineering, Southeast University, China
- GPA 3.84/4.0

WORK

09/2017-present **Research fellow**
International Iberian Nanotechnology Laboratory, Portugal
- Advisor: Lorena Dieguez

RESEARCH

Research works

1. Developing a SERS-assisted 3D barcode chip for high-throughput immunoassays.
2. Developing a versatile SERS-microfluidic chip for studying cancer-immune cell-cell communications and the screening of immunotherapeutic drugs.
3. Developing a reusable microfluidic chip for SERS-fluorescence dual mode immunoassay.
4. Developing a droplet SERS-microfluidic chip for label-free detection of thiocyanate in human body fluids.
5. Improving the sensitivity of immunoassays by fabricating novel SERS probes with gold@silver core-shell nanorods.
6. Employing SERS encoding technique for multiplex detection of cancer biomarkers.

Skills

Nanofabrication	• Fabrication, assembly, characterization and biochemical conjugation of nanoparticles and nanosubstrates
Optical sensing	• Design and fabrication of SERS/fluorescence nanoprobes (for labeled immunoassays, cell targeting and drug delivery) • Design and fabrication of SERS nanosubstrates • Employing SERS encoding technique for multiplex detections • SERS/fluorescence measurement, imaging and spectra analysis
Immunoassay	• Developing optical (SERS/fluorescence) immunoassays on various platforms (solid substrates, magnetic beads and microfluidic chips)
Microfluidics	• Designing optofluidic chips for biomedical applications
Cell culture	• Cell culture on dishes, plates and microfluidic chips
Other	• Adjusting optical paths in confocal microscope and Raman spectrometer

Instruments

Professional:	Raman spectrometer (HORIBA T64000)
	Confocal microscope (Olympus Fluoview FV1000)
Experienced:	UV-Vis Spectrophotometer, zetasizer, spectrofluorometer
Familiar:	Microplate reader, AFM, femtosecond laser
Know about:	SEM, TEM, FTIR, EDX, Super-resolution optical microscope

PUBLICATIONS

Journal Articles

1. **Wu, L.**; Wang, Z. Y.; Zhang, Y. Z.; Fei, J.Y.; Chen, H.; Zong, S. F.; Cui, Y. P. In situ probing of cell–cell communications with surface-enhanced Raman scattering (SERS) nanoprobes and microfluidic networks for screening of immunotherapeutic drugs. ***Nano Research*** 2017, *10*, 584-594.

2. **Wu, L.**; Wang, Z. Y.; Fan, K. Q.; Zong, S. F.; Cui, Y. P. A SERS-assisted 3D barcode chip for high-throughput biosensing. ***Small*** 2015, *11*, 2798-2806.

3. **Wu, L.**; Wang, Z. Y.; Zong, S. F.; Cui, Y. P. Rapid and reproducible analysis of thiocyanate in real human serum and saliva using a droplet SERS-microfluidic chip. ***Biosensors & Bioelectronics*** 2014, *62*, 13-18.

4. **Wu, L.**; Wang, Z. Y.; Zong, S. F.; Chen, H.; Wang, C. L.; Xu, S. H.; Cui, Y. P. Simultaneous evaluation of p53 and p21 expression level for early cancer diagnosis using SERS technique. ***Analyst*** 2013, *138*, 3450-3456.

5. **Wu, L.**; Wang, Z. Y.; Zong, S. F.; Huang, Z.; Zhang, P. Y.; Cui, Y. P. A SERS-based immunoassay with

highly increased sensitivity using gold/silver core-shell nanorods. ***Biosensors & Bioelectronics*** 2012, *38*, 94-99.

6. Fei, J. Y.; **Wu, L.**; Zhang, Y. Z.; Zong, S. F.; Wang, Z. Y.; Cui, Y. P. Pharmacokinetics-on-a-Chip Using Label-Free SERS Technique for Programmable Dual-Drug Analysis. ***ACS Sensors*** 2017, *2*, 773-780.
7. Wang, Z. Y.; Zong, S. F.; **Wu, L.**; Zhu, D.; Cui, Y. P. SERS-activated Platforms for Immunoassay: Probes, Encoding Methods and Applications. ***Chemical Reviews*** 2017, *117*, 7910-7963.
8. Zhang, Y. Z.; Wang, Z. Y.; **Wu, L.**; Pei, Y. W.; Chen, P.; Cui, Y. P. Rapid simultaneous detection of multi-pesticide residues on apple using SERS technique. ***Analyst*** 2014, *139*, 5148-5154.
9. Zhang, Y. Z.; Wang, Z. Y.; **Wu, L.**; Zong, S. F.; Yun, B. F.; Cui, Y. P. Dual peptides modified fluorescence-SERS dual mode imaging nanoprobes with improved cancer cell targeting efficiency. ***RSC Advances*** 2016, *6*, 81046-81052.
10. Chen, H.; Wang, Z. Y.; Zong, S. F.; **Wu, L.**; Chen, P.; Zhu, D.; Wang, C. L.; Xu, S. H.; Cui, Y. P. SERS-Fluorescence Monitored Drug Release of a Redox-Responsive Nanocarrier Based on Graphene Oxide in Tumor Cells. ***ACS Applied Materials & Interfaces*** 2014, *6*, 17526-17533.
11. Wang, Z. L.; Zong, S. F.; Wang, Z. Y.; **Wu, L.**; Chen P.; Yun, B. F.; Cui, Y. P. Microfluidic chip based micro RNA detection through the combination of fluorescence and surface enhanced Raman scattering techniques. ***Nanotechnology***, 2017, *28*, 105501-105508.
12. Chen, H.; Wang, Z. Y.; Zong, S. F.; Chen, P.; Zhu, D.;**Wu, L.**; Cui, Y. P. A graphene quantum dot-based FRET system for nuclear-targeted and real-time monitoring of drug delivery. ***Nanoscale*** 2015, *7*, 15477-15486.
13. Liu, M.; Wang, Z. Y.; Zong, S. F.; Chen, H.; Zhu, D.; **Wu, L.**; Hu, G. H.; Cui, Y. P. SERS Detection and Removal of Mercury(II)/Silver(I) using Oligonucleotide-Functionalized Core/Shell Magnetic Silica Sphere@Au Nanoparticles. ***ACS Applied Materials & Interfaces*** 2014, *6*, 7371-7379.
14. Chen, P.; Wang, Z. Y.; Zong, S. F.; Zhu, D.; Chen, H.; Zhang, Y. Z.;**Wu, L.**; Cui, Y. P. pH-sensitive nanocarrier based on gold/silver core-shell nanoparticles decorated multi-walled carbon manotubes for tracing drug release in living cells. ***Biosensors & Bioelectronics*** 2016, *75*, 446-451.

Conference Proceedings

1. **Wu, L.**; Wang, Z. Y.; Fan, K. Q.; Zong, S. F.; Cui, Y. P. A reusable biosensor chip for SERS-fluorescence dual mode immunoassay. *Proceedings of SPIE. Third International Symposium on Laser Interaction with Matter*. 2015.
2. Fan, K. Q.; Wang, Z. Y.; **Wu, L.**; Zong, S. F.; Cui, Y. P. A SERS-based microfluidic immunoassay using an in-situ synthesized gold substrate. *Proceedings of SPIE. Third International Symposium on Laser Interaction with Matter*. 2015.

CONFERENCE PRESENTATIONS

1. **Wu, L.**; Wang, Z. Y.; Zhang, Y. Z.; Cui, Y. P. Probing cell–cell communications with SERS immunoprobes

and microfluidic chip for drug discovery. *Lab on a chip Asia*, 2016, Singapore. **(Oral presentation, speaker)**

2. **Wu, L.**; Wang, Z. Y.; Cui, Y. P. A SERS-assisted barcode chip for multiplex protein analysis. *Bio-Optics: Design and Application (BODA)*, 2015, Vancouver, Canada. **(Oral presentation, speaker)**
3. **Wu, L.**; Wang, Z. Y.; Fan, K. Q.; Zong, S. F.; Cui, Y. P. A reusable biosensors chip for SERS-fluorescence dual mode immunoassay, *3rd International Symposium on Laser Interaction with Matter(LIMIS)*, 2014, Nanjing, China. **(Oral presentation, speaker)**
4. **Wu, L.**; Wang, Z. Y.; Zong, S. F.; Huang, Z., Zhang, P. Y.; Cui, Y. P. A SERS-based immunoassay with highly increased sensitivity using gold@sliver core-shell nanorods. *The International Conference on Advanced Laser Applications in Science and Engineering*, 2012, Nanjing, China. **(Oral presentation, speaker)**
5. Cui, Y. P.; Wang, Z. Y.; **Wu, L.**; Zong, S. F.; Optical immunoassay protocols using functionalized nanoparticles. *Bio-Optics: Design and Application (BODA)*, 2013, Hawaii, USA. **(Invited talk, speaker)**

AWARDS/HONORS

Youth Optical Science and Technology Award of Jiangsu Province (2015)

National Scholarship for Graduate Students (2013 & 2015)

First Class Prize for Excellent Undergraduate Graduation Theses of Jiangsu Province (2013)

Excellent Graduate of Southeast University (2012)

President Scholarship of Southeast University (2011)

National Scholarship for Undergraduate Students (2009 & 2010)

ADDITIONAL

President, Southeast University Student Chapter of OSA (2014 - 2017)