# Curriculum Vitae


## Shaopeng Wang

Research Professor
Biodesign Center for Bioelectronics and Biosensors, Arizona State University
shaopeng.wang@asu.edu Tel: 480.727.7081 Fax: 480.965.9457


### Education

- B. S. in Biological Sciences & Biotechnology, Advisor: Prof. Sen-fang Sui, Tsinghua University, Beijing, China, 1985.09-1990.07
- M. S. in Biophysics, Advisor: Prof. Sen-fang Sui, Tsinghua University, Beijing, China, 1990.09-1993.03
- Ph. D. in Physical Chemistry, Advisor: Prof. Roger M. Leblanc, University of Miami, Miami, Florida, 1994.09-1999.07
- Postdoctoral training in Physics, Advisor: Prof. Nongjian Tao, Florida International University, 1999.09-2001.07

### Research Interests

- Biosensors and Bioinstrumentation;
- Optical and electrochemical sensing for chemical and biological targets;
- Current focus: Plasmonic-based Electrochemical Impedance Microscopy (P-EIM) for imaging and detection of chemical, biological molecules and live cells; charge-based detection of small molecules, imaging-based rapid antibiotic susceptibility test.

### Professional Experiences

***University of Miami, Miami, FL, 1994 – 1999, Graduate Teaching and Research Assistant***

- Taught laboratory classes of general chemistry and organic chemistry.
- Conducted research on Langmuir monolayer and Langmuir-Blodgett films.

***Florida International University, Miami, FL, 1999 – 2001, Postdoctoral Research Associate***

- Conducted research and development on multi-wavelength surface plasmon resonance spectroscopy,
- Conducted research on chemical sensor and biosensors based on optical and nanotechnology.

***ICx Nomadics Inc., Stillwater, OK, 2001 – Dec 1, 2008, Senior Scientist, Principle Investigator***

- Conducted research and development on several nanoparticle related projects for LED, sensing, fluorescence labeling, and therapeutic applications, and had hands-on experiences on nanoparticle synthesis, surface modification, conjugation and characterization.
- Conducted research and development on surface plasmon resonance spectroscopy based sensors, amplified fluorescence polymer based sensors, and cell based sensors, and had hands-on experiences on optical instrument design and implementation.
- Conducted research and development on several tissue-engineering projects that used inverted colloidal crystal as tissue scaffold for different applications, and had hands-on experiences on mammal cell culture and characterization.
- Responsible for grant proposal development, project management and reporting, instrument and methodology development and implementation, and mentoring of junior researchers.

***Biodesign Center for Bioelectronics and Biosensors, Arizona State University, Tempe, AZ, Dec 1, 2008-2015, Associate Professor, Research***

- Conducted research and development on optical biosensors for biomedical applications
- Responsible for proposal writing, project management, instrument and methodology development, mentoring of multiple graduate students and postdocs.
- Taught surface plasmon resonance imaging technique for Biological Design graduate class and workshops

***Biodesign Center for Bioelectronics and Biosensors, Arizona State University, Tempe, AZ, Dec 1, 2015-present, Professor, Research***

- Conduct research and development on optical biosensors for biomedical applications
- Responsible for proposal writing, project management, instrument and methodology development, and managing a lab with ~15 graduate students, postdocs and visiting scholars.

## Professional services

*Professional Membership*

- 1995- American Chemical Society
- 1995- Beta Chapter of Alpha Epsilon Lambda
- 2003-2004 Tissue engineering Society International
- 2004-2005 Association for Laboratory Automation
- 2009- the Electrochemical Society
- 2012- American Physical Society

*Journal Editorial board*

Biosensors: https://www.mdpi.com/journal/biosensors/editors

*Journal Referee*

ACS Applied Materials & Interfaces, ACS Biomaterials Science & Engineering, **ACS nano**, ACS Omega, ACS sensors, **Advanced Materials**, Analytical and Bioanalytical Chemistry, **Analytical Chemistry**, Analytical Methods, Applied Spectroscopy, Applied Surface Science, Arabian Journal of Chemistry, Biomacromolecules, Biosensors, **Biosensors and Bioelectronics**, Cancer Nanotechnology, Colloids and Surfaces B, Environmental Science and Technology, Fibers, Journal of Applied Physics, Journal of Nano Medicine, Journal of Nanoscience and Nanotechnology, Journal of Proteome Research, Journal of Biomedical Nanotechnology, Journal of Innovative Optical Health Sciences, **Journal of the American Chemical Society**, Journal of Translational Engineering in Health and Medicine, Lab on a Chip, **Langmuir**, Materials, **Nano letter**, **Nature Biotechnology**, **Nature Nanotechnology**, PLoS One, Research, Review of Scientific Instrument, **Scientific Report**, Sensor Letters, Sensors, Sensors & Actuators B,

*Grant Reviewer*

- ACS-Petroleum Research Fund
- U.S. Civilian Research and Development Foundation
- National Institute of Health
    - 2012.02.21-23 ZRG1 BST-T (90) review panel, Bioengineering Sciences and Technologies, Academic Research Enhancement Award Grants (R15)
    - 2014.03.27 NCI/IMAT review panel, Early-Stage Innovative Technology Development for Cancer Research (R21)

- 2016.03.08 National Cancer Institute Special Emphasis Panel (ZCA1-TCRB-6 (M3)) for Innovative Molecular Analysis Technologies for Cancer Research (RFA-CA-15-002, R21)
- 2017.02.07-08 NIH CSR Enabling Bioanalytical and Imaging Technologies (EBIT) study section (R01 and R21)
- 2019.03.29 NIH/NIBIB ZEB1 OSR-E(M2) review panel: Mentored Career Development (K) and Conference (R13) Award Application

*University Services*

- 2011.01 - present Biodesign Personnel Committee, ASU
- 2015.05 – 2018.05 Faculty Advisor, Sun Devils Badminton Club, ASU

*Other Services*

- 2016.05 Grand Award Judge for Biomedical Engineering, 2016 Intel international Science and Engineering Fair (ISEF), Phoenix, Arizona

## Honors and Awards

- *Student Scientific and Technology Competition Award,* Tsinghua University, 1987
- *Experimental Technique Award*, Tsinghua University, 1990
- *Guanghua Scholarship*, Tsinghua University, 1991
- *Laboratory Construction Award*, Tsinghua University, 1993
- *Mr. Hua Luogeng Memorial Fellowship*, Tsinghua University, 1993
- *Travel Fellowship*, 11th International Biophysics Congress, 1993
- *Graduate Teaching Assistantship*, University of Miami, 1994-1998
- *Best Student Presentation Award*, Colloid and Surface Chemistry Division's Poster Session, 211th American Chemistry Society National Meeting, New Orleans, 1996
- *Max and Peggy Kriloff Graduate Student Travel Scholarship*, University of Miami, 1997
- *First Prize of Physical Science in the Third Annual UM Graduate Student Research & Creativity Forum*, University of Miami, 1998
- *Outstanding Graduate Student Award*, Department of Chemistry, University of Miami, 1998
- *Excellence Graduate Research Award*, Department of Chemistry, University of Miami, 1998
- *Excellence in Graduate Academic Achievement and Research Creativity*, Department of Chemistry, College of Arts and Sciences, University of Miami, 1999
- *Elected to Who's Who Among Students in American Universities & Colleges*, University of Miami, 1999

## Research Support

*Active Research Support*

***Genentech Inc. AGR 11/05/18, 10/30/2018 – 10/29/2020***

Title: Direct quantification of binding kinetics between phage and mRNA displayed peptide
Description: To develop charge sensitive optical detection (CSOD) technology for measurement of phage displayed peptides binding to protein targets.
Role on Project: PI

***Biosensing USA, BIG126720, 5/1/2018 - 10/31/2020***

Title: Nano-Oscillator Arrays for Sensitive Plasmonic Detection of Molecular Interaction

Description: The success of this project will lead to a new technology to address the unmet need for quantifying small molecule binding kinetics and biochemical reactions kinetics.

Role on Project: Co-I

***NIH NIGMS 2R01GM107165, 09/01/2018-08/31/2023***

Title: Quantitative label-free imaging of electrical activities in cells
Description: To develop a label-free imaging technology for studying electrical activities in cells with high spatial and temporal resolutions. This unique capability will provide new insights into the roles of electrical activities in many biological processes, including brain and cardiac functions, wound healing and tissue development, and will lead to a new method for screening drugs targeting these processes.
Role on Project: PI

***NIH NIAID 1R01AI138993-01 07/25/2018 - 06/30/2023***

Title: Point-of-care antimicrobial susceptibility testing based on simultaneous tracking of multi-phenotypic features of single bacterial cells
Description: To develop a culture-independent technology for point-of-care diagnosis of antimicrobial-resistant bacteria in urinary tract infections within 3 hours, by imaging urine samples directly with an innovative large-image-volume imaging technique and analyzing the data with a machine-learning model. Successful development of the technology will enable precise antibiotic prescriptions and accurate treatment of the patient on the same day of visit.
Role: Co-I

***NIH NIGMS 1R01GM124335-01 07/01/2017 - 06/31/2021***

Title: Measuring small molecule interactions with membrane proteins on single cells via detecting nanometer scale membrane deformations
Description: to develop a label-free optical-imaging method to quantify binding kinetics of small molecules to membrane proteins via measuring binding induced nanometer scale cellular membrane deformation.
Role: Co-PI

***NIH NCI IMAT R33CA202834 08/01/2016 - 07/31/2019***

Title: Charge sensitive optical detection for high-throughput study of small molecules
Description: develops a microplate compatible, charge sensitive detection method using optical fiber probes for high-throughput study of small molecule binding kinetics.
Role: Co-PI

***Biosensing USA, (Via NIH NIGMS 1R44GM114951-01), 4/1/2015-3/31/2020***

Title: An Integrated Microarray Printing and Detection System

Description: To develop an integrated microarray printing and detection system (IMPDS) that enables high-throughput analysis of protein interactions kinetics in microarray or whole-cell based formats.

Role on Project: PI

*Completed*

***NIH NIGMS 1R01GM107165, 07/01/2014-06/30/2018***

Title: Quantitative label-free imaging of membrane protein interaction kinetics on cells
Description: A new imaging technique will be developed for studying the binding kinetics of membrane proteins in their native cellular environment.
Role on Project: PI

***Moore Foundation, 04/12/2013-07/31/2016***

Title: Label-free imaging and tracking of single protein-protein interactions
Description: To develop a capability to image the morphology, chemical reactions and charge distributions of a living system with molecular scale spatial and temporal resolution.
Role on Project: Co-PI

***Biosensing USA (Via NIH NIGMS 1R44GM106579), 04/01/2013-03/31/2017***

Title: Electrochemically-Enhanced Plasmonic Imaging for Quantitative Proteomics
Description: To develop an electrochemically-enhanced plasmonic imaging (ECEPI) system that enables high-throughput analysis of protein interactions with small molecules and characterization of post-translational modifications in microarray or whole-cell based formats.
Role on Project: Co-PI

***NIH NCI R21CA173205 09/01/2012 - 08/31/2015***

Title: Charge sensitive optical detection for high-throughput study of small molecules
Description: develops an optical method to measure electrical conductance, making it possible to map ion channel opening and closing activities noninvasively with high spatial and temporal resolution.
Role: Co-PI

***NSF #1151005 (12010088) 02/01/2012 – 01/31/2016***

Title: IDBR: Plasmonic-based electrochemical impedance microscopy for studying molecular binding and cellular processes
Description: This project focuses on developing a plasmonic-based electrochemical impedance microscope (P-EIM).
Role: Co-PI (PI: NJ Tao)

***W. M. Keck Foundation, 07/01/2011-06/30/2016***

Title: A Self-Assembled Nanomechanical System (NMES) for Molecular Detections
Description: To develop a nanoparticle based mechanical resonator with optical/electronics detections for molecular detections.
Role on Project: Co-PI

***Amgen 2012577119 11/13/12 – 05/12/15***

Title: Evaluate P-EIM technology for membrane protein binding affinities measurement
Description: The goal of the project is to establish P-EIM as a new platform for determining interaction kinetics between drug candidates and membrane protein targets, where the membrane proteins are either in native cellular environment or isolated and stabilized with nanodisc.
Role: PI

***NIH R21 1R21DA033839-01 04/01/2012 - 03/31/2015***

Title: Plasmonic Mapping of Ion Channel Activities in Single Cells
Description: develops an optical method to measure electrical conductance, making it possible to map ion channel opening and closing activities noninvasively with high spatial and temporal resolution.
Role: Co-PI

***Piper Bridge Award (Virginia Piper Foundation), 04/01/2012-06/30/2013***

Title: Measure Protein Interaction at Scale
Description: Measure protein interaction kinetics using Electrochemically Enhanced Surface Plasmon Resonance Imaging(EC-SPRi) and Nucleic Acid-Programmable Protein Array (NAPPA)

Role on Project: Co-PI

***NIH R21 RR026235 (8R21GM103396) 05/15/2010-02/28/2013***

Title: A Multi-functional Optical Impedance Microscope for Live Cell Imaging
Description: To develop a new label-free microscopy that can capture sub-micron resolution impedance images of live cells optically, and can obtain surface plasmon resonance, optical and fluorescence microscopy images simultaneously.
Role: PI

***Contract # W81XWH-05-C-0128 (DOD), 05/20/05 – 11/30/09***

Title: 3D Scaffold and Stem Cell-Based Bioengineered Skin for Treatment of Cutaneous Vesicant Injury

Description: Develop 3D scaffold and stem cell-based bioengineered skin for treatment of cutaneous vesicant injury.

Role: PI, Co-PI

***Contract # W81XWH-05-C-0101 (DOD), 02/01/05 – 03/03/08***

Title: Nanoparticle Self-Lighting Photodynamic Therapy for Ovarian Cancer Treatment

Description: Design and fabricate nanoparticle self-lighting photodynamic therapy for ovarian cancer treatment

Role: PI.

***Contract # W81XWH-06-C-0038 (DOD), 12/01/05 – 12/30/06***

Title: Rapid Cell-based Toxicity Sensor Using Integrated Micro Ring-resonators as Signal Transducer

Description: Develop a rapid cell-based toxicity sensor using integrated microring resonators as signal transducer.

Role on Project: PI

***Contract # W81XWH-04-C-0139 (DARPA), 10/01/05 – 5/31/06***

Title: Accelerated Vaccine Creation and Testing

Description: Develop artificial human immune system for accelerated vaccine creation and testing, including development of 3D tissue construct and in-situ optical sensing technology to monitor tissue growth.

Role: Technical lead

***Contract # 6302 and #6443 (OCAST), 07/01/03 – 9/30/05***

Title: AR 03(2)-068, Development of Artificial Tissue Constructs

Description: This project aims toward the design of a rigid, porous ex vivo cell scaffold that mimics the structure of bone marrow by using nanomaterials. This scaffold will be used to support stem cell expansion and differentiation.

Role: PI

***Contract # DE-FG02-04ER84022 (DOE), 07/13/04 – 04/12/05***

Title: Surface Plasmon Resonance Sensor for Radionuclides

Description: Develop a portable sensor based on surface plasmon resonance spectroscopy and anodic stripping voltammetry to detect radionuclides and other analytes of interest for environmental monitoring, industrial chemical detection, biomedical, and homeland security applications.

Role: PI

***Contract # DAMD17-02-1-0702 (DARPA), 10/01/02 – 3/31/04***

Title: 3D Tissue Constructs by Sequential Layering for Ex-vivo Immune System

Description: Develop inverted colloidal scaffolds for 3D cell and tissue culture for the construction of artificial human immune system.

Role on Project: Technical lead

***Contract # DMI-0214696 (NSF), 07/01/2002 – 12/31/2002***

Title: Trace Metal Ion Sensor based on High Resolution Surface Plasmon Resonance and Anodic Stripping Voltammetry

Description: Develop a highly sensitive sensor based on surface plasmon resonance spectroscopy and anodic stripping voltammetry to detect trace metal ions of interest for environmental monitoring, industrial chemical detection, biomedical, and homeland security applications.

Role: PI

## Publications

H-index 37, i10-index 81, total citation 5555 as of 08/12/2019.
Google Scholar: http://scholar.google.com/citations?user=lMFxDUsAAAAJ&hl=en
My NCBI Bibliography: https://www.ncbi.nlm.nih.gov/myncbi/browse/collection/40547370
*Corresponding Author

### *Peer reviewed journal articles*

1. F Zhang, Y Guan, Y Yang, A Hunt, **S Wang**, HY Chen, N Tao, Optical tracking of nanometer-scale cellular membrane deformation associated with single vesicle release, ACS sensors, 2019. DOI: 10.1021/acssensors.9b01201

2. M Mo, Y Yang, F Zhang, W Jing, R Iriya, J Popovich, **S Wang**, T Grys, S. E. Haydel, N. Tao, Rapid Antimicrobial Susceptibility Testing of Patient Urine Samples using Large Volume Free-Solution Light Scattering Microscopy, *Analytical chemistry,* 2019, 911510164-10171. DOI: 10.1021/acs.analchem.9b02174.

3. Y Yang, X Liu, **S Wang**, N Tao, Plasmonic imaging of subcellular electromechanical deformation in mammalian cells, Journal of Biomedical Optics, 2019, 24 (6), 066007

4. Guan-Da Syu, Shih-Chin Wang, Guangzhong Ma, Shuang Liu, Donna Pearce, Atish Prakash, Brandon Henson, Lien-Chun Weng, Devlina Ghosh, Pedro Ramos, Daniel Eichinger, Ignacio Pino, Xinzhong Dong, Jie Xiao, **Shaopeng Wang**, Nongjian Tao, Kwang Sik Kim, Prashant J. Desai & Heng Zhu, Development and application of a high-content virion display human GPCR array, ***Nature Communications*** (2019)**10**:1997. DOI: 10.1038/s41467-019-09938-9

5. Ma, Guangzhong; Syu, Guan-Da; Shan, Xiaonan; Henson, Brandon; **Wang, Shaopeng**; Desai, Prashant; Zhu, Heng; Tao, Nongjian, Measuring ligand binding kinetics to membrane proteins using virion nano-oscillators, *Journal of the American Chemical Society*, 2018, Sep 12;140(36):11495-11501. doi: 10.1021/jacs.8b07461. PubMed PMID: 30114365. NIHMSID: 994023

6. Hui Yu, Wenwen Jing, Rafael Iriya, Yunze Yang, Karan Syal, Manni Mo, Thomas E Grys, Shelley E Haydel, **Shaopeng Wang**, Nongjian Tao, Phenotypic antimicrobial susceptibility testing with deep learning video microscopy, *Anal. Chem*., 2018, 90 (10), pp 6314–6322, DOI: 10.1021/acs.analchem.8b01128

7. Y. Yang, X.W. Liu, H. Wang, H. Yu, Y. Guan, **S. Wang**, and N. Tao, Imaging Action Potential in Single Mammalian Neurons by Tracking the Accompanying Sub-Nanometer Mechanical Motion, *ACS Nano*, 2018, 12, 4186-4193. DOI: 10.1021/acsnano.8b0086723, PMCID: PMC6141446.

8. Yu H, Yang Y, Yang Y, Zhang F, **Wang S**, Tao N. Tracking fast cellular membrane dynamics with sub-nm accuracy in the normal direction. Nanoscale. 2018 Feb 28. doi: 10.1039/c7nr09483c. PubMed PMID: 29488990. PMCIF: PMC5854544.

9. Fenni Zhang, Wenwen Jing, Ashley Hunt, Hui Yu, Yunze Yang, **Shaopeng Wang**, Hong-Yuan Chen, and Nongjian Tao, Label-Free Quantification of Small Molecule Binding to Membrane Proteins on Single Cells by Tracking Nanometer-Scale Cellular Membrane Deformation, *ACS Nano*, 2018, DOI: 10.1021/acsnano.8b00235. PubMed PMID: 29397682, PMCID: PMC5851003.

10. Iriya R, Syal K, Jing W, Mo M, Yu H, Haydel SE, **Wang S**, Tao N. Real-time detection of antibiotic activity by measuring nanometer-scale bacterial deformation. J Biomed Opt. 2017 Dec;22(12):1-9. doi: 10.1117/1.JBO.22.12.126002. PubMed PMID: 29235272.

11. Yang Y, Liu X, Yu H, Guan Y, **Wang S**, Tao N. Imaging action potential in single mammalian neurons by tracking the accompanying sub- nanometer mechanical motion, 2018, *ACS nano*, 12, 5, 4186-4193. DOI: 10.1021/acsnano.8b00867. Preprint deposited in: https://www.biorxiv.org/content/early/2017/07/25/168054

12. Syal, Karan; Shen, Simon; Yang, Yunze; **Wang, Shaopeng**; Haydel, Shelley; Tao, Nongjian, Rapid antibiotic susceptibility testing of uropathogenic E. coli by tracking sub-micron scale motion of single bacterial cells, 2017, *ACS Sensors*, 2017, *2* (8), pp 1231–1239. DOI: 10.1021/acssensors.7b00392

13. Liu, X.-W., Yang, Y., Wang, W., **Wang, S.**, Gao, M., Wu, J. and Tao, N. Plasmonic-Based Electrochemical Impedance Imaging of Electrical Activities in Single Cells. 2017, *Angew. Chem. Int. Ed.. 56*, 8855, doi:10.1002/anie.201703033, PubMed PMID: 28504338, PMCID: PMC5837822.

14. H Yu, X Shan, **S Wang**, N Tao, Achieving high spatial resolution surface plasmon resonance microscopy with image reconstruction, *Anal. Chem.*, 2017, *89* (5), pp 2704–2707. DOI: 10.1021/acs.analchem.6b05049.

15. Y Wang, X Shan, H Wang, **S Wang**, N Tao, Plasmonic imaging of surface electrochemical reactions of single gold nanowires, *J. Am. Chem. Soc*., 2017, *139* (4), pp 1376–1379. DOI: 10.1021/jacs.6b10693.

16. K Syal, M Mo, H Yu, R Iriya, W Jing, G Sui, **S Wang**, TE Grys, SE Haydel, N Tao, Current and emerging techniques for antibiotic susceptibility tests, *Theranostics* 2017, 7 (7), 1795-1805

17. Jin Lu, Yunze Yang, Wei Wang, Jinghong Li, Nongjian Tao*, **Shaopeng Wang***, Label-free imaging of histamine mediated G protein-coupled receptors activation in live cells, *Anal. Chem.* 2016, 88, 11498−11503. DOI: 10.1021/acs.analchem.6b02677. PMCID# PMC5144837 (Open access)

18. Guangzhong Ma, Yan Guan, **Shaopeng Wang***, Han Xu*, and Nongjian Tao*, Study Small Molecule-Membrane Protein Binding Kinetics with Nanodisc and Charge Sensitive Optical Detection, *Anal. Chem.* 2016, *88*, 2375-2379, DOI: 10.1021/acs.analchem.5b04366. NIHMS836629, PubMed # 26752355

19. Yixian Wang, Xiaonan Shan, **Shaopeng Wang**, and Nongjian Tao, Imaging Local Electric Field Distribution by Plasmonic Impedance Microscopy, *Anal. Chem.* 2016, *88*, 1547-1552, DOI: 10.1021/acs.analchem.5b04382

20. Karan Syal, Rafael Iriya, Yunze Yang, Hui Yu, **Shaopeng Wang**, Shelley E Haydel, Hong-Yuan Chen, and Nongjian Tao, Antimicrobial Susceptibility Test with Plasmonic Imaging and Tracking of Single Bacterial Motions on Nanometer Scale, *ACS Nano*, 2016, 10(1), 845-852. DOI: 10.1021/acsnano.5b05944

21. Zixuan Chen, Xiaonan Shan, Yan Guan, **Shaopeng Wang**, Jun-Jie Zhu, and Nongjian Tao, Imaging Local Heating and Thermal Diffusion of Nanomaterials with Plasmonic Thermal Microscopy, ACS Nano, 2015, 9 (12), pp 11574–11581 DOI: 10.1021/acsnano.5b05306

22. Simon Shen, Karan Syal, Nongjian Tao* and **Shaopeng Wang***, Note: An automated image analysis method for high-throughput classification of surface-bound bacterial cell motions, *Review of Scientific Instrument*, 2015, 86, 126104. DOI: 10.1063/1.4937479

23. Linliang Yin, **Shaopeng Wang***, Xiaonan Shan, Shengtao Zhang, Nongjian Tao*, Quantification of protein interaction kinetics in a micro droplet, *Review of Scientific Instruments*, 2015, *86*, 114101. DOI: 10.1063/1.4934802. PMCID: PMC4636506. (RSI editor's Picks, Featured Article, Cover Article)

24. Xiaonan Shan, Shan Chen, Hui Wang, Zixuan Chen, Yan Guan, Yixian Wang, **Shaopeng Wang**, Hong-Yuan Chen, Nongjian Tao, Mapping Local Quantum Capacitance and Charged Impurities in Graphene via Plasmonic Impedance Imaging, Advanced Materials, 2015, 27(40), 6213-6219, DOI: 10.1002/adma.201502822

25. Yan Guan, Xiaonan Shan, Fenni Zhang, **Shaopeng Wang**, Hong-Yuan Chen, Nongjian Tao, Kinetics of small molecule interactions with membrane proteins in single cells measured with mechanical amplification, *Science Advances*, 2015, *1*, e1500633. DOI: 10.1126/sciadv.1500633

26. Fenni Zhang, **Shaopeng Wang***, Linliang Yin, Yunze Yang, Yan Guan, Wei Wang, Han Xu and Nongjian Tao*, Quantification of Epidermal Growth Factor Receptor Expression Level and Binding Kinetics on Cell Surfaces by Surface Plasmon Resonance Imaging, *Anal. Chem.* 2015, 87 (19), 9960-9965. DOI: 10.1021/acs.analchem.5b02572. PMID: 26368334, NIHMSID 777521, PMCID: PMC4836855

27. Linliang Yin, Yunze Yang, **Shaopeng Wang**, Wei Wang, Shengtao Zhang, Nongjian Tao, Measuring the binding kinetics of antibody-conjugated gold nanoparticles with intact cells, *Small, 11(31),* 3782-3788. Doi:10.1002/smll.201500112. PMCID: PMC4552349. PMID: 25865036

28. Yunze Yang, Hui Yu, Xiaonan Shan, Wei Wang, Xianwei Liu, **Shaopeng Wang**, and Nongjian Tao, Label-Free Tracking of Single Organelle Transportation in Cells with Nanometer Precision Using a Plasmonic Imaging Technique, *Small*, *11(24)*, 2878-2884, 2015, DOI: 10.1002/smll.201403016. PMCID: PMC4474744

29. Linliang Yin, Wei Wang, **Shaopeng Wang**, Fenni Zhang, Shengtao Zhang, Nongjian Tao, How does fluorescent labeling affect the binding kinetics of proteins with intact cells? *Biosensors and Bioelectronics*, 2015, *66*, 412-416. DOI: 10.1016/j.bios.2014.11.036. PMID: 25486538. NIHMSID 647485, PMCID: PMC4836836.

30. Karan Syal, Wei Wang, Xiaonan Shan, **Shaopeng Wang**, Hong-Yuan Chen, Nongjian Tao, Plasmonic imaging of protein interactions with single bacterial cells, *Biosens. Bioelectron.,* 2015, *63*, 131-137. DOI: 10.1016/j.bios.2014.06.069.

31. Yixian Wang, Xiaonan Shan, Fengjuan Cui, Jinghong Li, **Shaopeng Wang**, Nongjian Tao, Electrochemical reactions in sub-femtoliter-droplets studied with plasmonics-based electrochemical current microscopy, *Analytical Chemistry*, 2015, 87(1), 494-498, DOI: 10.1021/ac5036692.

32. Wei Wang, Linliang Yin, Laura Gonzalez-Malerva, **Shaopeng Wang**, Xiaobo Yu, Seron Eaton, Shengtao Zhang, Hong-Yuan Chen, Joshua LaBaer, Nongjian Tao, In situ drug-receptor binding kinetics in single cells: a quantitative label-free study of anti-tumor drug resistance, *Scientific Reports*, 2014, *4*, doi:10.1038/srep06609. PMCID: PMC4196117

33. Wenbin Liang, **Shaopeng Wang***, Fernanda Festa, Peter Wiktor, Wei Wang, Mitchell Magee‖, Joshua LaBaer*, Nongjian Tao*, Measure Small Molecule Binding Kinetics on Protein Microarray by Plasmonic-based Electrochemical Impedance Imaging, *Analytical Chemistry*, 2014, *86* (19), 9860–9865. DOI: 10.1021/ac5024556, PMCID# PMC4188269.

34. Hui Yu, Xiaonan Shan, **Shaopeng Wang**, Hong-Yuan Chen, Nongjian Tao, Molecular scale origin of surface plasmon resonance biosensors, *Analytical Chemistry*, 2014, *86* (18), 8992-8997. DOI: 10.1021/ac501363z

35. Xiaonan Shan, Yimin Fang, **Shaopeng Wang**, Yan Guan, Jongyuan Chen and Nongjian Tao, Detection of charges and molecules with self-assembled nano-oscillators, *Nano Lett*., 2014, *14* (7), 4151–4157. DOI: 10.1021/nl501805e.

36. Hui Yu, Xiaonan Shan, **Shaopeng Wang**, Jongyuan Chen and Nongjian Tao, Plasmonic Imaging and Detection of Single DNA Molecules, *ACS Nano*, 2014, *8* (4), 3427–3433. DOI: 10.1021/nn4062885. http://pubs.acs.org/doi/abs/10.1021/nn4062885

37. Yan Guan, Xiaonan Shan, **Shaopeng Wang**, Peiming Zhang, and Nongjian Tao, Detection of molecular binding via charge-induced mechanical response of optical fibers, *Chemical Science*, 2014, *5* (11), 4375-4381. DOI: 10.1039/C4SC01188K. NIHMSID 836629

38. Christopher MacGriff, Ly Nguyen, **Shaopeng Wang,*** Nongjian Tao, Note: Four-port microfluidic flow-cell with instant sample switching, *Review of Scientific Instruments*, 2013, *84*(10), 106110. DOI: 10.1063/1.4826359. PMCID: PMC4108724.

39. Christopher MacGriff, **Shaopeng Wang***, Peter Wiktor, Wei Wang, Xiaonan Shan, Nongjian Tao, Charge-based Detection of Small Molecules by Plasmonic-based Electrochemical Impedance Microscopy, *Analytical Chemistry*, *85* (14), 6682–6687, 2013. DOI: 10.1021/ac400475z.

40. Xiaonan Shan, Ismael Díez-Pérez, Luojia Wang, Peter Wiktor, Ying Gu, Lihua Zhang, Wei Wang, Jin Lu, **Shaopeng Wang**, Qihuang Gong, Jinghong Li & Nongjian Tao, Imaging the electrocatalytic activity of single nanoparticles, *Nature Nanotechnology*, 2012, *7*, 668–672. doi:10.1038/nnano.2012.134.

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### *Book chapters*

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### *Conference Proceedings*

1. A. Ramachandran, S. Ja, J. Clarke, E. Flood, G. Frye-Mason, D. Goad, B. Little, L. Wald, **S. Wang**, E. T. Knobbe, Optical Microring Resonators in Trace chemical and Biosensing Applications, *The 9th CBW Protection Symposium* – May 22-27, 2007, Svenska Mässan/The Swedish Exhibition and Congress Centre, Gothenburg.
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### *Conference Presentations and Invited talks*

1. N. Tao, **S. Wang**, "Charge Sensitive Optical Detection of Small Molecules", 2018 NCI IMAT PI meeting, 19th Annual Innovative Molecular Analysis Technologies Principal Investigators Meeting, Rockville, MD, Nov 28-30, 2018.
2. **S. Wang**, "Are neurons bilingual?", invited talk, Faculty Chalk Talk, Biodesign Institute, Arizona State University, Tempe, AZ, Oct 29, 2018.
3. M. Mo, W. Jing, H. Yu, F. Zhang, **S. Wang**, and N. Tao, "Image-based Rapid Antibiotic Susceptibility Test", Poster Presentation, 256th ACS National Meeting & Exposition, Boston, Massachusetts, Aug 19-23, 2018.
4. **S. Wang**, "Label-free Quantification of Small Molecule Binding Kinetics", invited talk, Sino-ASU Biodesign Symposium, Arizona State University, Tempe, AZ, Jul 23, 2018.
5. F. Zhang, W.n Jing, A. Hunt, Y. Yang, **S. Wang**, and Nongjian Tao, "Label-Free Quantification of Small Molecule Interactions with Membrane Proteins in Single Cells by Mechanical Amplification", poster presentation, BPS18, 62nd Annual Meeting of Biophysical Society, San Francisco, California, February 17-21, 2018.
6. R. Liang, G. Ma, A. Hoyt, **S. Wang**, N. Tao, "Charge Sensitive Optical Detection of Small Molecules", 2017 NCI IMAT PI meeting, 18th Annual Innovative Molecular Analysis Technologies Principal Investigators Meeting, Rockville, MD, Dec 6-8, 2017.
7. N. Tao, **S. Wang**, "Charge Sensitive Optical Detection for High Throughtput Study of Small Molecules", 2016 NCI IMAT PI meeting, 17th Annual Innovative Molecular Analysis Technologies Principal Investigators Meeting, Bethesda, Maryland, Dec 1-2, 2016.
8. **S. Wang**, "Imaging-Based Detection Technologies for Biomedical Applications", invited talk, Advancing Biophysics, Biosensors and Biomimetics, A symposium to honor Dr. Stuart Lindsay, Arizona State University, Tempe, AZ, Oct 14, 2016.
9. **S. Wang** and NJ Tao, "Detecting Small Molecule-Membrane Protein Binding Kinetics", Keynote Speech on Sensors, 229th Electrochemistry Society (ECS) meeting, San Diego, CA, May 31, 2016.
10. **S. Wang**, "Imaging-based tracking of single bacterial cells toward culture-free antimicrobial susceptibility test", invited talk, FUSION 2016: Biodesign Scientific Retreat, Carefree, Arizona, April 1st, 2016. https://biodesign.asu.edu/fusion-2016
11. G. Ma, Y. Guan, Y. Chen, **S. Wang**, N. Tao, "Charge Sensitive Optical Detection for High-throughput Study of Small Molecules", 2015 NCI IMAT PI meeting, 16th Annual Innovative Molecular Analysis Technologies Principal Investigators Meeting, Bethesda, Maryland, Nov 12-13, 2015.
12. S. Shen, K. Syal, N. Tao, **S. Wang**, "Automatic, High-throughput Motion Classification of Surface-attached E. Coli Cells Using Bright Field Microscopy Data", Western Regional Meeting 2015, 45th Western Regional Meeting of the American Chemical Society, San Maros, CA, Nov 6-8, 2015.

13. **S. Wang**, "Plasmonic Imaging of Chemical and Biological Targets", invited talk, Institute of Chemistry, Chinese Academy of Sciences, Beijing, China, Dec 23, 2014.
14. **S. Wang**, "Development of an Ultra-Fast and Ultra-Sensitive Plasmonic Imaging System", invited talk, Moore Imaging Conference, Gordon and Betty Moore Foundation, Sausalito, California, Dec 4-6, 2014.
15. **S. Wang**, C. MacGriff, X. Shan, W. Wang and NJ Tao, "IDBR: Plasmonic-based Electrochemical Impedance Microscopy for Studying Molecular Binding and Cellular Processes", invited talk, NSF IDBR PI workshop, Arlington, VA, May 1-2, 2014.
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18. N. J. Tao and **S. Wang**, Plasmonic-based Electrochemical Impedance Microscopy (P-EIM) for Label-free Cell Based Assay and Small Molecule Detections, invited talk by Dr. Han Xu, Amgen Inc., Thousand Oaks, CA, Nov. 09, 2011.
19. **S. Wang**, Novel Applications of Objective-based Surface Plasmon Resonance Microscopy, invited talk by Dr. Honda Wang, presented at Changchun institute of Applied Chemistry, Chinese Academy of Sciences, Changchun, China, April 29, 2011.
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26. **S. Wang**, Development of Optical Sensors for Chemical and Biological Targets, invited oral presentation, *2006 Florida Award Symposium, Florida Annual Meeting and Exposition*, Orlando, Florida, May 12, 2006.
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