Curriculum Vitae

Fenni Zhang

Biodesign Center for Bioelectronics and Biosensors, Arizona State University, Tempe, AZ 85287

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CURRENT RESEARCH INTERESTS

- Biosensors and Bioinstrumentation
- Optical sensing for biomedical applications

EDUCATION

- Ph.D. in Electrical Engineering, Advisor: Prof. Nongjian Tao, Arizona State University, Tempe, AZ, 2013.08-2018.07
- M.S. in Biomedical Engineering, Advisor: Prof. Qingjun Liu, Zhejiang University, Hangzhou, China, 2010.09-2013.03
- B.S. in Biomedical Engineering, Advisor: Prof. Qingjun Liu, Zhejiang University, Hangzhou, China, 2006.09-2010.07

PROFESSIONAL EXPERIENCE

Assistant Research Professor, Biodesign Center for Bioelectronics and Biosensors, ASU, Tempe, AZ, 06/2020-Present

• Video based rapid antibiotic susceptibility testing (AST)
• Machine learning for automatic ID and AST
• Clinical sample testing

Postdoctoral Research Associate/ Research Professional, Biodesign Center for Bioelectronics and Biosensors, ASU, Tempe, AZ, 09/2018-05/2020

• Imaging-based rapid antibiotic susceptibility testing (AST)
• Multi-phenotypic features tracking for automatic ID and AST

Graduate Research Assistant, Biodesign Center for Bioelectronics and Biosensors, ASU, Tempe, AZ, 08/2013-07/2018

• Optical tracking of single vesicle release
• Measuring small molecule interactions with membrane proteins on single cells with mechanical amplification
• Surface Plasmon Resonance imaging of molecular interaction with membrane proteins on cell surface

Graduate Research Assistant, Biosensor National Special Laboratory, Zhejiang University, Hangzhou, China, 09/2010-03/2013

• Extracellular recording of taste electrophysiological signals with microelectrodes array
• Olfactory epithelium biosensor

CURRENT RESEARCH SUPPORT

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

Role: Technical lead. Responsible for developing sample prep and data collection protocol, image processing and machine learning algorithms for rapid bacteria ID and AST, testing clinical samples, supervising 3 graduate students and one undergraduate student worker, coordinating with different collaborators, and help in writing of grant application, project progress reports and manuscripts.

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

Role: Technical lead. Responsible for developing cell-based optical biosensor for small molecules interaction with membrane proteins, design and conducting experiments, analyzing data, supervising graduate students, and help in writing of grant application, project progress and manuscripts.

ACADEMIC SERVICES

Reviewer for ACS Sensors

AWARDS

- 2013 Excellent Postgraduate Students' Award, Zhejiang University
- 2012 National Scholarship for Graduate, Zhejiang University
- 2012 First-class Award of Honor for Graduate, Zhejiang University
- 2012 Graduate of Merit/Triple A graduate, Zhejiang University
- 2012 Guorui Scholarship, Zhejiang University
- 2011 First-class Award of Honor for Graduate, Zhejiang University
- 2011 Graduate of Merit/Triple A graduate, Zhejiang University
- 2011 Outstanding Graduate Leader Award, Zhejiang University

PUBLICATIONS

1. **Fenni Zhang**, Shaopeng Wang, Jiapei Jiang, Michelle McBride, Yunze Yang, Manni Mo, Rafael Iriya, Joseph Peterman, Thomas Grys, Shelley E. Haydel, Nongjian Tao, "Direct Antimicrobial Susceptibility Testing on Clinical Urine Samples by Optical Tracking of Single Cell Division Events", ***Small,*** 2020, submitted.
2. Di Wang, **Fenni Zhang (co-first author)**, Kyle R. Mallires, Vishal Varun Tipparaju, Jingjing Yu, Erica Forzani, Nongjian Tao, and Xiaojun Xian, "Chemical Sensing CMOS imager", ***Science Advances***, 2020, submitted.
3. **Fenni Zhang**, Shaopeng Wang, Yunze Yang, Jiapei Jiang, Nongjian Tao, "Imaging single bacterial cells with electro-optical impedance microscopy", ***ACS sensors***, 2020, DOI: 10.1021/acssensors.0c00751.
4. **Fenni Zhang**, Yan Guan, Yunze Yang, Ashley Hunt, Shaopeng Wang, Hong-Yuan Chen, and Nongjian Tao. "Optical tracking of nanometer-scale cellular membrane deformation associated with single vesicle release". ***ACS Sensors***, 2019, 4(8), 2205-2212.
5. **Fenni Zhang**, Wenwen Jing, Ashely Hunt, Hui Yu, Yunze Yang, Shaopeng Wang, Hong-Yuan Chen, 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, 12(2), 2056-2064.

6. **Fenni Zhang**, Shaopeng Wang, Linliang Yin, Yunze Yang, Yan Guan, Wei Wang, Han Xu, Nongjian Tao. "Quantification of Epidermal Growth Factor Receptor Expression Level and Binding Kinetics on Cell Surfaces by Surface Plasmon Resonance Imaging", ***Analytical Chemistry***, 2015, 87(19), 9960-9965.
7. **Fenni Zhang**, Qian Zhang, Diming Zhang, Yanli Lu, Qingjun Liu, Ping Wang. "Biosensor analysis of natural and artificial sweeteners in intact taste epithelium", ***Biosensors and Bioelectronics***, 2014, 54, 385-392.
8. Qingjun Liu (Advisor), **Fenni Zhang**, Diming Zhang, Ning Hu, Hua Wang, K. Jimmy Hsia, Ping Wang. "Bioelectronic tongue of taste buds on microelectrode array for salt sensing", ***Biosensors and Bioelectronic*s**, 2013, 40(1), 115-120.
9. Qingjun Liu (Advisor), **Fenni Zhang**, Diming Zhang, Ning Hu, K. Jimmy Hsia, Ping Wang. "Extracellular potentials recording in intact taste epithelium by microelectrode array for a bioelectronic tongue", ***Biosensors and Bioelectronics***, 2013, 43, 186-192.
10. Qingjun Liu (Advisor), **Fenni Zhang**, Ning Hu, Hua Wang, Kuen Jimmy Hsia, Ping Wang "Microelectrode Recording of Tissue Neural Oscillations for a Bionic Olfactory Biosensor", ***Journal of Bionic Engineering***, 2012, 9(4), 494-500.
11. Zhu, Hao, **Fenni Zhang**, Hui Wang, Zhixing Lu, Hong-yuan Chen, Jinghong Li, and Nongjian Tao. "Optical Imaging of Charges with Atomically Thin Molybdenum Disulfide." ***ACS Nano***, 2019, 13(2), 2298-2306.
12. Mo, Manni, Yunze Yang, **Fenni Zhang**, Wenwen Jing, Rafael Iriya, John Popovich, Shaopeng Wang, Thomas Grys, Shelley E. Haydel, and Nongjian Tao. "Rapid antimicrobial susceptibility testing of patient urine samples using large volume free-solution light scattering microscopy." ***Analytical Chemistry*,** 2019, 91(15), 10164-10171.
13. 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(9), e1500633.
14. Hui Yu, Yuting Yang, Yunze Yang, **Fenni Zhang**, Shaopeng Wang, and Nongjian Tao. "Tracking fast cellular membrane dynamics with sub-nm accuracy in the normal direction." ***Nanoscale***, 2018, 10(11), 5133-5139.
15. Qingjun Liu, Ning Hu, **Fenni Zhang**, Hua Wang, Weiwei Ye, Ping Wang "Neurosecretory cell-based biosensor: Monitoring secretion of adrenal chromaffin cells by local extracellular acidification using light-addressable potentiometric sensor", ***Biosensors and Bioelectronics***, 2012, 35(1), 421-424.
16. Qingjun Liu, Diming Zhang, **Fenni Zhang**, Yang Zhao, K. Jimmy Hsia, Ping Wang "Biosensor recording of extracellular potentials in the taste epithelium for bitter detection" ***Sensors and Actuators B: Chemical,*** 2013, 176, 497-504.
17. Qingjun Liu, Ning Hu, **Fenni Zhang**, Diming Zhang, K Jimmy Hsia, Ping Wang, "Olfactory epithelium biosensor: odor discrimination of receptor neurons from a bio-hybrid sensing system", ***Biomedical Microdevices***, 2012, 14(6), 1055-1061.
18. 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.
19. Qingjun Liu, Ning Hu, Weiwei Ye, **Fenni Zhang**, Hua Wang, and Ping Wang, "Odors Discrimination by Olfactory Epithelium Biosensor", ***AIP Conference Proceedings***, 2011, 1362, 230-231.
20. Qingjun Liu, Ning Hu, Weiwei Ye, Hua Cai, **Fenni Zhang**, Ping Wang, "Extracellular recording

of spatiotemporal patterning in response to odors in the olfactory epithelium by microelectrode arrays", ***Biosensors and Bioelectronics***, 2011, 27, 12-17.

21. Qingjun Liu, Hua Wang, Hongliang Li, Jing Zhang, Shulin Zhuang, **Fenni Zhang**, K. Jimmy Hsia, Ping Wang, "Impedance sensing and molecular modeling of an olfactory biosensor based on chemosensory proteins of honeybee", ***Biosensors and Bioelectronics***, 2013, 40, 174-179.

PROVISIONAL PATENT APPLICATION

1. NJ Tao, **Fenni Zhang**, Shaopeng Wang "An Improved Method for Rapid Digital Antimicrobial Susceptibility Testing", 06/24/2020, application number 63/043,713.

CONFERENCES

2. Spring 2019 ACS National Meeting in Orlando, Florida, 2019. Oral presentation.
3. World Preclinical Congress in Boston, MA, 2017. Oral presentation.
4. 10th Annual Next Generation Summit in Washington, DC, 2018. Poster.
5. Biophysical Society (BPS) 62nd Annual Meeting in San Francisco, California, 2018. Poster.
6. 11th Annual USHUPO Conference –Next Generation Proteomics in Tempe, AZ, 2015. Poster.