

Corso: THE BIOTECHNOLOGY AND BIOSENSORS FOR PHYSIOLOGICAL AND PHYSIOPATHOLOGICAL PARAMETERS DETECTION, FROM DIAGNOSTIC PURPOSE TO THERAPEUTIC DEVELOPMENT (BioPhyDe) 3 crediti

profs Tiziana Pietrangelo- Xuanhong Cheng

Il corso si propone di guidare gli studenti nel mondo dei biosensori e della sensoristica per il monitoraggio dei parametri fisiologici e fisiopatologici. Lo scopo del corso è quello di esaminare il principio di funzionamento degli strumenti già validati e in uso per fini diagnostici, ma anche e soprattutto porre l'accento ai possibili ulteriori sviluppi in campo terapeutico. Partendo dalla diagnostica convenzionale (test di gravidanza, biosensori elettrochimici (ad es. sensore per il glucosio) e biosensori elettrici / ottici (ad es. smart watch), si passerà alla elettronica indossabile alla diagnostica miniaturizzata, a biosensori portatili (spettrometri di massa portatili, NMR ecc.) valutando le sfide e prospettive future e futuribili.

Video di una intervista al prof Cheng su diagnostica HIV:

<https://www.youtube.com/watch?v=5JKVGsV08TA>

1. 31 maggio 2021 Tiziana Pietrangelo 3h
2. 1 giugno Xuanhong Cheng 2h
3. 3 giugno Xuanhong Cheng 2h
4. 7 giugno Xuanhong Cheng 2h
5. 8 giugno Xuanhong Cheng 2h
6. 9 giugno Xuanhong Cheng 2h
7. 10 giugno Xuanhong Cheng 2h
8. 11 giugno Xuanhong Cheng 3h

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B. PUBLICATIONS AND CREATIVE ACTIVITIES

- **Book Chapters**

1. Liju Yang, **Xuanhong Cheng**, Yi-Shao Liu, Rashid Bashir, “Lab-on-a-chip Impedance Detection of Microbial and Cellular Activity”, in *Methods in Bioengineering Book Series*, edited by Nahmias Yaakov and Sangeeta Bhatia, Artech House, Boston, MA, 2009

- **Articles in Refereed Journals (in chronicle order, bold is corresponding author, [Journal Impact Factor/Citations²])**

2. Xuanhong Cheng, Yanbing Wang, Yael Hanein, Karl F. Böhringer and **Buddy D. Ratner**^{DA}, “Novel Cell Patterning Using Microheater-controlled Thermoresponsive Surface Chemistry,” *Journal of Biomedical Materials Research Part A*, 70A, 159-168 (2004) (**SFB Outstanding Research Award**). [3.231/128]
3. Heather E. Canavan, Xuanhong Cheng, Dan J. Graham, Buddy D. Ratner^{DA} and **David G. Castner**, “Surface Characterization of the Extracellular Matrix Remaining after Cell Detachment from a Thermoresponsive Polymer,” *Langmuir*, 21, 1949-1955 (2005). (**Cover Image of Langmuir**). [3.789/190]
4. Heather E. Canavan, Xuanhong Cheng, Dan J. Graham, Buddy D. Ratner^{DA} and **David G. Castner**, “Cell Sheet Detachment Affects the Extracellular Matrix: A Surface Science Study Comparing Thermal Lift-off, Enzymatic and Mechanical Methods,” *Journal of Biomedical Materials Research Part A*, 75A, 1-13 (2005). [3.231/209]
5. Xuanhong Cheng, Heather E. Canavan, M. Jeanette. Wenzel, James R. Hull, Matthew S. Wagner, Sasha J. Kweskin, Rosnita A. Talib, Sally L. McArthur, Gabor A. Somorjai, David G. Castner, **Buddy D. Ratner**^{DA}, “Characterization of the Surface Chemical and Mechanical Properties of Plasma Polymerized *N*-isopropylacrylamide,” *Langmuir*, 21, 7833-7841(2005). [3.789/181]
6. Xuanhong Cheng, Heather E. Canavan, Dan J. Graham, David G. Castner and **Buddy D. Ratner**^{DA}, “Temperature Dependent Activity and Structure of Adsorbed Proteins on Plasma Polymerized *N*-isopropyl Acrylamide,” *BiointerPhases*, 1, 61-72(2006). [2.455/80]
7. Heather E. Canavan, Xuanhong Cheng, Dan J. Graham, Buddy D. Ratner^{DA} and **David G. Castner**, “A Plasma-Deposited Surface for Cell Sheet Engineering: Advantages over Mechanical Dissociation of Cells,” *Plasma Processes and Polymers*, 3, 516-523(2006). [2.7/38]
8. Heather E. Canavan, Dan J. Graham, Xuanhong Cheng, Buddy D. Ratner^{DA} and **David G. Castner**, “Comparison of Native Extracellular Matrix with Adsorbed Protein Films Using Mass Spectrometry,” *Langmuir*, 23, 50-56(2007). (**Cover Image of Langmuir**). [3.789/98]
9. Xuanhong Cheng, Daniel Irimia, Meredith Dixon, Kazuhiko Sekine, Utkan Demirci, Lee Zamir, Ronald G. Tompkins, William Rodriguez^{PA} and **Mehmet Toner**^{PA}, “A Microfluidic Device for Practical Label-free CD4+ T Cell Counting of HIV-infected Subjects,” *Lab on a Chip*, 7, 170-178(2007). (**Featured by Royal Society of Chemistry**). [5.995/357]

Each author annotated with P=postdoctoral researcher, D=Lehigh Doctoral student, M=Lehigh Master’s student, U=Lehigh Undergraduate student, DA=Cheng’s doctoral adviser, PA=Cheng’s postdoctoral adviser, LF=other Lehigh faculty, bold=corresponding author.

[Journal impact factor/citations] indicated at the end of each publication
2017/2018 Journal Impact Factor access from journal website on June 4, 2019
Number of citations according to Google Scholar as of June 4, 2019

10. Xuanhong Cheng, Yi-shao Liu, Daniel Irimia, Utkan Demirci, Liju Yang, Lee Zamir, William R. Rodríguez^{PA}, Mehmet Toner^{PA} and **Rashid Bashir**, “Cell Detection and Counting through Cell Lysate Impedance Spectroscopy in Microfluidic Devices,” *Lab on a Chip*, 7, 746-755(2007). [5.995/163]
11. Meiling Li, Ganga Fernando, Lorraine G. van Waasbergen, Xuanhong Cheng, Buddy D. Ratner^{DA} and **Gary R. Kinsel**, “Thermoresponsive MALDI Probe Surfaces as a Tool for Protein On-Probe Purification,” *Analytical Chemistry*, 79, 6840 -6844(2007). [6.042/8]
12. Xuanhong Cheng, Daniel Irimia, Meredith Dixon, Joshua C. Ziperstein, Utkan Demirci, Lee Zamir, Ronald G. Tompkins, Mehmet Toner^{PA} and **William Rodriguez**^{PA}, “A Microchip Approach for Practical Label-free CD4+ T Cell Counting of HIV-infected Subjects in Resource-Poor Settings,” *Journal of AIDS*, 45, 257-261(2007). (Featured by MIT Tech Review). [4.116/115]
13. Kenneth Kotz, Xuanhong Cheng and **Mehmet Toner**^{PA}, “PDMS Device Fabrication and Surface Modification,” *Journal of Visualized Experiments*, DOI: 10.3791/319, available at <http://www.jove.com/index/Details.stp?ID=319> (2007). [1.325/8]
14. Kenneth Kotz, Xuanhong Cheng and **Mehmet Toner**^{PA}, “Cell Capture Using a Microfluidic Device,” *Journal of Visualized Experiments*, 8, 320 (2007) DOI: 10.3791/320. [1.325/1]
15. Murat Tunc, Mark Humayun, Xuanhong Cheng and **Buddy D. Ratner**^{DA}, “A Reversible Thermosensitive Adhesive for Retinal Implants-In Vivo Experience with Plasma-deposited Poly(N-Isopropyl Acrylamide),” *Retina-the Journal of Retinal and Vitreous Diseases*, 28(9), 1338-1343 (2008). [4.013/20]
16. Xuanhong Cheng, Grace Chen, and **William Rodriguez**^{PA}, “Micro- and Nanotechnology for Viral Detection,” *Analytical and Bioanalytical Chemistry*, 393(2), 487-501 (2009) (**Critical Review**). [3.307/60]
17. Xuanhong Cheng, Amit Gupta, Chichen Chen, Ronald G. Thompkins, William Rodriguez^{PA} and **Mehmet Toner**^{PA}, “Enhancing the performance of a point-of-care CD4+ T-cell counting microchip through monocyte depletion for HIV/AIDS diagnostics,” *Lab on a Chip*, 9(10), 1357-1364 (2009). [5.995/115]
18. Murat Tunc, Umran Yildirim, Harun Yuksel, Xuanhong Cheng, Mark Humayun and **Buddy Ratner**^{DA}, “Conjunctival Impression Cytology by Using a Thermosensitive Adhesive: Polymerised N-isoprophyl acrylamide,” *Retina*, 28(7), 770-773 (2009). [4.013/3]
19. Xuanhong Cheng, E. Yegan Erdem, Shoji Takeuchi, Hiroyuki Fujita, Buddy D. Ratner^{DA} and **Karl F. Böhringer**, “Infrared Light Induced Patterning of Proteins on ppNIPAM Thermoresponsive Thin Films: a Protein Laser Printer,” *Lab on a Chip*, 10(8), 1079-1085 (2010). [5.995/8]
20. Nicholas N. Watkins, Supriya Sridhar, Xuanhong Cheng, Mehmet Toner^{PA}, William Rodriguez^{PA} and **Rashid Bashir**, “A Microfabricated Electrical Differential Counter for the Selective Enumeration of CD4+ T Lymphocytes,” *Lab on a Chip*, 11(8), 1437-1447 (2011). [5.995/69]
21. Bu Wang^D, Pisist Kumnorkaew^D, Alex Weldon^D, James F. Gilchrist^{LF} and **Xuanhong Cheng**, “Effect of Surface Nanotopography on Immunoaffinity-Based Cell Capture in Microfluidic Devices,” *Langmuir*, 27(17), 11229-11237 (2011). [3.789/34]
22. Chao Zhao^D and **Xuanhong Cheng**, “Microfluidic Separation of Viruses from Blood Cells Based on Intrinsic Transport Processes,” *Biomicrofluidics*, 5(3), 032004_1-10 (2011). [2.571/16]

23. Yonggang Gao^D, Qiaoqiang Gan,^D Zheming Xin^D, Xuanhong Cheng and **Filbert J. Bartoli**^{LF}, “Plasmonic Mach–Zehnder Interferometer for Ultrasensitive On-Chip Biosensing,” *ACS Nano*, 5(12), 9836–9844 (2011). [13.709/106]
24. Matt S. Steele, Mitra Singhal and **Xuanhong Cheng**, “Emerging technologies for point-of-care CD4 T-lymphocyte counting,” *Trends in Biotechnology*, 30(1), 45-54 (2012) (Critical Review). [13.578/99]
25. Alex Weldon^D, Pisist Kumnorkaew^D, Bu Wang^D, Xuanhong Cheng and **James F. Gilchrist**^{LF}, “Fabrication of Macroporous Polymeric Membranes through Binary Convective Deposition,” *ACS Applied Materials and Interfaces*, 4(9), 4532-4540 (2012). [8.097/13]
26. Chao Zhao^D, Alparsian Oztekin^{LF} and **Xuanhong Cheng**, “Gravity-induced swirl of nanoparticles in microfluidics,” *Journal of Nanoparticle Research*, 15(5), 1611_1-14 (2013). [2.127/3]
27. Yi Hu^D, Xuanhong Cheng and **H. Daniel Ou-Yang**^{LF}, “Enumerating virus-like particles in an optically concentrated suspension by fluorescence correlation spectroscopy,” *Biomedical Optics Express*, 4(9), 1646-1653 (2013). [3.482/9]
28. Shu-Han Wu, Kuang-Li Lee , Arthur Chiou, **Xuanhong Cheng** and **Pei-Kuen. Wei**, “Optofluidic Platform for Real-time Monitoring of Live Cell Secretory Activities Using Fano Resonance in Gold Nanoslit,” *Small*, 9(20), 3532-3540, DOI: 10.1002/sml.201203125(2013). [9.59/35]
29. Yongkang Gao^D, Qiaoqiang Gan^D, Zeming Xin^D, Xuanhong Cheng and **Filbert J. Bartoli**^{LF}, “Plasmonic Interferometers for Label-free Multiplexed Sensing,” *Optics Express*, 21(5), 5859-5871 (2013). [3.356/51]
30. Yongkang Gao^D, Qiaoqiang Gan^D, Zeming Xin^D, Xuanhong Cheng and **Filbert J. Bartoli**^{LF}, “Plasmonic Interferometric Sensor Arrays for High-performance Label-free Biomolecular Detection,” *Lab on a Chip*, 13, 4755-4764 (2013). [5.995/79]
31. Krissada Surawathanawises^D and **Xuanhong Cheng**, “Nanoporous anodic aluminum oxide with a long-range order and tunable cell sizes by phosphoric acid anodization on pre-patterned substrates,” *Electrochimica Acta*, 117, 498-503 (2014). [5.116/18]
32. Chao Zhao^D, Alparsian Oztekin^{LF} and **Xuanhong Cheng**, “Measuring the Soret Coefficient of Nanoparticles in a Dilute Suspension,” *Journal of Nanoparticle Research*, 16(10), 2625_1-11 (2014). [2.127/6]
33. Yaqing Ning^D, Caroline Multari^D, Xi Luo^D, Cristiano Palego^P, Xuanhong Cheng, **James C. M. Hwang**^{LF}, Agnese Denzi, Caterina Merla, Francesca Apollonio, and Micaela Liberti, “Broadband Electrical Detection of Individual Biological Cells,” *IEEE Transactions on Microwave Theory and Techniques*, 62(9), 1905-1922 (2014). [3.176/47]
34. Bu Wang^D, Sabrina Jedlicka^{LF} and **Xuanhong Cheng**, “Maintenance and Neuronal Cell Differentiation of Neural Stem Cells C17.2 Correlated to Medium Availability Sets Design Criteria in Microfluidic Systems,” *PLOS One*, DOI: 10.1371/journal.pone.0109815 (2014). [2.766/12]
35. Agnese Denzi, Caterina Merla, Cristiano Palego, Alessandra Paffi, Yaqing Ning^D, Caroline R. Multari^D, Xuanhong Cheng, Francesca Apollonio, James C. M. Hwang^{LF}, and **Micaela Liberti**, “Assessment of cytoplasm conductivity by nanosecond pulsed electric fields,” *IEEE Trans. Biomedical Engineering*, 62(6), 1595-1603 (2015). [4.288/26]
36. Wenli Ouyang^D, Wei Wei^D, Xuanhong Cheng, X. Frank Zhang^{LF}, Edd B. Webb III^{LF} and **Alp Oztekin**^{LF}, “Flow-induced conformational change of von Willebrand Factor multimer:

- Results from a molecular mechanics informed model,” *Journal of Non-Newtonian Fluid Mechanics* 217, 58-67 (2015). [2.293/10]
37. Bu Wang^D and **Xuanhong Cheng**, “Enhancement of Binding Kinetics on Affinity Substrates by Laser Point Heating Induced Transport,” *Analyst*, 141, 1807-1813 (2016). [3.89/6]
 38. Krissada Surawathanawises^D and **Xuanhong Cheng**, “Microfluidic Devices with Templated Regular Macroporous Structures for HIV Viral Capture,” *Analyst*, 141, 1669-1677 (2016). [3.864/1]
 39. Shunqiang Wang^D, Antony Thomas^D, Elaine Lee, Shu Yang, Xuanhong Cheng and **Yaling Liu**^{LF}, “Highly Efficient and Selective Isolation of Rare Tumor Cells Using a Microfluidic Chip with Wavy-herringbone Micro-patterned Surfaces,” *Analyst*, 141, 2228-2237 (2016). [3.864/29]
 40. Jing Liu^D, Liping Pan^M, Xuanhong Cheng and **Yevgeny Berdichevsky**^{LF}, “Perfused drop microfluidic device for brain slice culture-based drug discovery,” *Biomedical Microdevices*, 18 (3), 1-10 (2016). [2.077/7]
 41. Lin Zhou, Kun Wang, Zhenhua Wu, Haidao Dong, Hao Sun, Xuanhong Cheng, Hong lian Zhang, Hongbo Zhou, Chunping Jia, Qinghui Jin, Hongju Mao, Jean-Luc Coll, and **Jianlong Zhao**, "Investigation of Controllable Nanoscale Heat-Denatured Bovine Serum Albumin Films on Graphene." *Langmuir*, 32 (48): 12623-12631 (2016). [3.789/2]
 42. Justin Jahnke, Jessica Terrell, Austin Smith, **Xuanhong Cheng**, **Dimitra Stratis-Cullum**, “Influences of Adhesion Variability on the Living Dynamics of Filamentous Bacteria in Microfluidic Channels,” *Molecules*, 21 (8), 1-15 (2016). [3.098/5]
 43. Chao Zhao^D, Zhibo Cao^M, John Fraser^U, Alparslan Oztekin^{LF}, and **Xuanhong Cheng**, “Optimization of nanoparticle focusing by coupling thermophoresis and engineered vortex in a microfluidic channel,” *Journal of Applied Physics*, 121 (2), 024902 (2017). [2.176/2]
 44. Hang Li^P, Agnese Denzi, Xiao Ma^D, Xiaotian Du^D, Yaqing Ning^D, Xuanhong Cheng, Francesca Apollonio, Micaela Liberti, and **James C. M. Hwang**^{LF}, “Distributed Effect in High-Frequency Electroporation of Biological Cells,” *IEEE Transactions on Microwave Theory and Techniques*. 65 (9), 3503-3511 (2017). [3.176/10]
 45. Justin P. Jahnke, Austin M. Smith, Nicole E. Zander, Victoria Wiedorn^U, Kenneth E. Strawhecker, Jessica L. Terrell, Demitra N. Stratis-Cullum and **Xuanhong Cheng**., "Living" dynamics of filamentous bacteria on an adherent surface under hydrodynamic exposure. *Biointerphases*, 12 (2), 02c410 (2017). [2.455/1]
 46. Krissada Surawathanawises^D, Victoria Wiedorn^U and **Xuanhong Cheng**, “Micropatterned macroporous structures in microfluidic devices for viral separation from whole blood,” *Analyst*, 142 (12), 2220-2228 (2017). [3.864/3]
 47. Hang Li^P, Caroline Multari^D, Cristiago Palego, Xiao Ma^D, Xiaotian Du^D, Yaqing Ning^D, Javier Buceta^{LF}, James C. M. Hwang^{LF} and **Xuanhong Cheng**, “Differentiation of Live and Heat-killed E. coli by Microwave Impedance Spectroscopy,” *Sensors and Actuators B: Chemical*, 255 (Part 2), 1614-1622 (2018). [5.667/6]
 48. Wei Wei^D, Chuqiao Dong^D, Michael Morabito^D, Xuanhong Cheng, X. Frank Zhang^{LF}, Edmund B. Webb^{LF}, and **Alparslan Oztekin**^{LF}, “Coarse-Grain Modeling of Shear-Induced Binding between von Willebrand Factor and Collagen,” *Biophysical Journal*, 114 (8), 1816-1829 (2018). [3.495/1]
 49. Michael Morabito^D, Chuqiao Dong^D, Wei Wei^D, Xuanhong Cheng, Xiaohui F. Zhang^{LF}, Alparslan Oztekin^{LF}, and **Edmund Webb III**^{LF}, “Internal Tensile Force and A2 Domain

- Unfolding of von Willebrand Factor Multimers in Shear Flow,” *Biophysical Journal*, 115(10), 1860-1871 (2018). [3.495/2]
50. Xiao Ma^D, Xiaotian Du^D, Hang Li^P, Xuanhong Cheng and **James Hwang**^{LF}, “Ultra-wideband Impedance Spectroscopy of a Live Cell,” *IEEE Transactions on Microwave Theory and Techniques*, 66 (8), 3690-3696, (2018). [3.176/3]
 51. Thomas M. Reidy^M, Danli Luo^D, Priyokti Rana^U, Brenden Huegel^U and **Xuanhong Cheng**, “Transparency of PDMS Based Microfluidic Devices under Temperature Gradients,” *Journal of Micromechanics and Microengineering*, 29, 015014 (2018). [1.888/-]
 52. Hang Li^P, Xiao Ma^D, Xiaotian Du^D, Lei Li^D, **Xuanhong Cheng** and James C. M. Hwang^{LF}, “Correlation Between Optical Fluorescence and Microwave Transmission During Single-cell Electroporation,” *IEEE Transactions on Biomedical Engineering*, DOI: 10.1109/TBME.2018.2885781 (2018). [4.288/2]
 53. Yi Wang^D, Kiely Heinz and **Xuanhong Cheng**, “Tangential Flow Microfiltration for Viral Separation and Concentration,” *Micromachines (Basel)*, 10(5), 320 (2019). [2.222/-]
 54. Yifeng Qian^D, Zeng Xie^D, Yongkang Gao^D, Hang Li^P, Sushil Kumar^{LF}, **Xuanhong Cheng**, **Filbert Bartoli**^{LF}, “Intensity-modulated nanoplasmonic interferometric sensor for MMP-9 detection,” *Lab on a Chip*, 19(7), 1267-1276 (2019). [5.995/-]
 55. Yi Wang^D, Michael Morabito^D, Xiaohui F. Zhang^{LF}, Edmund Webb III^{LF}, Alparslan Oztekin^{LF} and **Xuanhong Cheng**, “Shear-Induced Extensional Response Behaviors of Tethered von Willebrand Factor,” *Biophysical Journal*, 116(11), 2092-2102 (2019). [3.495/-]
 56. **Marco Farina**, Xin Jin^D, Gianluca Fabi, Eleonora Pavoni, Andrea di Donato, Davide Mencarelli, Antonio Morini, Francesco Piacenza, Richard Al Hadi, Yan Zhao, Yaqing Ning^D, Tiziana Pietrangelo, Xuanhong Cheng, James CM Hwang^{LF}, “Inverted Scanning Microwave Microscope for in vitro Imaging and Characterization of Biological Cells,” *Applied Physical Letters*, 114(9), 093703 (2019). [3.495/1]
 57. **Edmund Webb III**^{LF}, Chunqiao Dong^D, Sagar Kania^D, Michael Morabito^D, Yi Wang^D, Xuanhong Cheng, Xiaohui F. Zhang^{LF}, Alparslan Oztekin^{LF}, “Multiscale Modeling of the Human Blood Protein von Willebrand Factor,” *Biophysical Journal*, 116(3), 323a (2019). [3.495/-]
 58. Michael Morabito^D, Mustafa Usta, Xuanhong Cheng, Xiaohui F. Zhang^{LF}, Alparslan Oztekin^{LF}, and **Edmund Webb III**^{LF}, “Prediction of Sub-Monomer A2 Domain Dynamics of the von Willebrand Factor by Random Forest Algorithm and Coarse-Grained Molecular Dynamics Simulation,” *Scientific Reports*, accepted (2019). [4.122/-]
 59. Xiao Ma^D, Hang Li^P, Xiaotian Du^D, Yaqing Ning^D, Vahid Gholizadeh^D, Cris Palego^P, Xuanhong Cheng and **James C. M. Hwang**^{LF}, “Sensitivity Analysis for Ultra-wideband 2-port Impedance Spectroscopy of a Live Cell,” *IEEE Journal of Electromagnetics, RF, and Microwaves in Medicine and Biology*, DOI: 10.1109/JERM.2019.2921221 (2019). [-/-]
 60. Xiaotian Du^D, Xiao Ma^D, Hang Li^P, , Lei Li^D, Xuanhong Cheng and **James C. M. Hwang**^{LF}, “Validation of Clausius-Mossotti Function in Wideband Single-Cell Dielectrophoresis,” *IEEE Journal of Electromagnetics, RF, and Microwaves in Medicine and Biology*, accepted (2019). [-/-]
 61. Xin Jin, Marco Farina, Xiaopeng Wang, Gianluca Fabi, Xuanhong Cheng, James C. M. Hwang, “Quantitative Scanning Microwave Microscopy of the Evolution of a Live Biological Cell in a Physiological Buffer,” *IEEE Transactions on Microwave Theory and Techniques*, 67(12), 5438-5445 (2019).

62. Shunqiang Wang, Younghyun Cho, Xuanhong Cheng, Shu Yang, Yi Liu, Yaling Liu, “Integration of Hierarchical Micro-/Nanostructures in a Microfluidic Chip for Efficient and Selective Isolation of Rare Tumor Cells”, *Micromachines*, 10(10), 698 (2019).
 63. Chuqiao Dong^D, Sagar Kania^D, Michael Morabito^D, X. Frank Zhang^{LF}, Wonpil Im^{LF}, Alparslan Oztekin^{LF}, Xuanhong Cheng and **Edmund B. Webb III**^{LF}, “A Mechano-Reactive Coarse-Grained Model of the Blood Clotting Agent von Willebrand Factor,” *Journal of Chemical Physics*, 151(12), 124905 (2019).
 64. Xuanhong Cheng and Yong Zeng, “Editorial for the Special Issue on “Micro-and Nanofluidics for Bionanoparticle Analysis,” *Micromachines*, 10(9), 600 (2019).
 65. **Frank Zhang** and **Xuanhong Cheng**, “Platelet Mechanosensing Axis Revealed (News and Views),” *Nature Materials*, 18, 661–662 (2019).
- **Working Papers**
 66. Danli Luo^D, Chao Zhao^D, Zhibo Cao^M, Alparslan Oztekin^{LF}, and **Xuanhong Cheng**, “Microfluidic nanoparticle focusing by coupling thermophoresis and engineered vortex,” in preparation (2019)
 67. Guanyang Xue^D, Danli Luo^D, Xuanhong Cheng and **Alp Oztekin**^{LF}, “A computational study of nanoparticle enrichment under temperature gradient,” in preparation (2018).
 68. Kathryn Kundrod^U, John Fraser^U, Kaylynn Genemaras^U and **Xuanhong Cheng**, “HIV Viral Load in a Macroporous Device by Cyclic Voltometry,” in preparation (2019).
 - **Published Reports and Conference Proceedings**
 1. Yabing Wang, Xuanhong Cheng, Yael Hanein and **Karl Bohringer**, “Protein Patterning with Programmable Surface Chemistry Chips,” *Proceedings of the Micro Total Analysis Systems 2002 Conference*, 482-484. [-/4]
 2. Yanbing Wang, Xuanhong Cheng, Yael Hanein, Ashutosh Shastry, Denice D Denton, Buddy D Ratner, **Karl F. Bohringer**, “Selective Attachment of Multiple Cell Types on Thermally Responsive Polymer,” *TRANSDUCERS'03. 12th International Conference on Solid-State Sensors, Actuators and Microsystems. Digest of Technical Papers*, 2, 979-982, 2003. [-/10]
 3. Buddy D. Ratner^{DA}, Xuanhong Cheng, Yanbing Wang, Yael Hanein and **Karl F. Böhringer**, “Temperature responsive polymeric surface modifications by plasma polymerization: cell and protein interactions,” *Abstracts of Papers of the American Chemical Society*, 225: U582-U582, 2004. [-/4]
 4. Karl F. Böhringer, Huseyin Bilge, Xuanhong Cheng, Buddy Ratner^{DA}, Shoji Takeuchi and **Hiroyuki Fujita**, “Infrared light induced patterning of proteins on ppNIPAM thermoresponsive thin films: a “protein laser printer,” *Proceedings of the 19th IEEE Conference on Micro Electro Mechanical Systems (MEMS)*, 530-533, Istanbul, Turkey, Jan. 2006. [-/4]
 5. Xuanhong Cheng, Daniel Irimia, Meredith Dixon, Kazuhiko Sekine, Utkan Demirci, Lee Zamir, Ronald G. Tompkins, William Rodriguez and **Mehmet Toner**^{PA}, “A Microfluidic Device for Practical Label-Free CD4+ T Cell Counting of HIV-Infected Subjects,” *Proceedings of the Micro Total Analysis Systems 2006 Conference*, 1561-1563. [-/-]
 6. Utkan Demirci, Meredith Dixon, Daniel Irimia, Xuanhong Cheng, Lee Zamir, William Rodriguez and **Mehmet Toner**^{PA}, “HIV Diagnostics for Resource-Limited Settings Using MEMS Based Techniques,” *Proceedings of the MicroTAS 2005 Conference*, 669-671. [-/-]

7. Cristiano Palego^P, Caterina Merla, Yaqing Ning^D, Caroline R^D. Multari, Xi Luo^D, Xuanhong Cheng and **James C. M. Hwang**^{LF}, “Broadband Microchamber for Electrical Detection of Live and Dead Biological Cells,” *IEEE MTT-S International Microwave Symposium Proceedings*, Seattle USA, Jun. 2013. [-/20]
8. Yaqing Ning^D, Caroline R. Multari^D, Xi Luo^D, Cristiano Palego^P, Dan Molinero, Xuanhong Cheng, **James C. M. Hwang**^{LF} and Caterina Merla, “Coplanar Stripline Microchamber for Electrical Detection of Live and Dead Biological Cells,” *Proceedings of the European Microwave Conference*, Nuremberg, Germany, Oct. 2013, pp. 475-478. [-/5]
9. Yaqing Ning^D, Caroline R. Multari^D, Xi Luo^D, Caterina Merla, Cristiano Palego^P, Xuanhong Cheng and **James C. M. Hwang**^{LF}, “Fast, compact and label-free electrical detection of live and dead single cells,” *Proceedings of the IEEE International Microwave Workshop Series RF Wireless Technologies Biomedical Healthcare Applications*, Singapore, Dec. 2013. [-/6]
10. Agnese Denzi, Caterina Merla, Cristiano Palego, Yaqing Ning^D, Caroline R. Multari^D, Xuanhong Cheng, Francesca Apollonio, James C. M. Hwang^{LF} and **Micaela Liberti**, “An improvement method of estimation for cell cytoplasm conductivity using nanosecond pulsed electrical fields: coupling of a microdosimetric model with experiments for a single cell,” *Proceedings of the BioEM Conference*, Cape Town, S. Africa, June 2014. [-/-]
11. Caroline R. Multari^D, Yaqing Ning^D, Xi Luo^D, Cristiano Palego, Agnese Denzi, Caterina Merla, Francesca Apollonio, Micaela Liberti, James C. M. Hwang^{LF} and **Xuanhong Cheng**, “Cell detection by a microfluidic-integrated broadband biosensor,” *Proceedings of the NTSTI-Nanotech Conference*, National Harbor, MD, June 2014, vol. 2, pp. 101-104, ISBN 978-1-4822-5827-1. [-/3]
12. Yaqing Ning^D, Caroline R. Multari^D, Xi Luo^D, Cristiano Palego, Xuanhong Cheng, **James C. M. Hwang**^{LF}, Agnese Denzi, Francesca Apollonio, Micaela Liberti and Caterina Merla, “Reproducible sensing of individual biological cells by broadband microwave signals,” *Proceedings of the IEEE Benjamin Franklin Symp. Microwave Antenna Sub-Systems Radar Telecommunications Biomedical Application*, Philadelphia, PA, Sept. 2014. [-/-]
13. Yaqing Ning^D, Caroline R. Multari^D, Cristiano Palego, Xuanhong Cheng, **James C. M. Hwang**^{LF}, Agnese Denzi, Caterina Merla, Francesca Apollonio and Micaela Liberti, “Fast, Compact and Label-Free Electrical Detection of Live and Dead Single Cells,” *Proceedings of the European Microwave Conference Workshop MEMS Technology Application*, Rome, Italy, Oct. 2014. [-/-]
14. Agnese Denzi, Caterina Merla, Francesca Apollonio, and Micaela Liberti, Yaqing Ning^D, Caroline R. Multari^D, Cristiano Palego, Xuanhong Cheng and **James C. M. Hwang**^{LF}, “Cell Detection and Discrimination by a Microfluidic-integrated Broadband Microchamber,” *Proceedings of the European Microwave Conference*, Rome, Italy, Oct. 2014. [-/3]
15. Xiao Ma^D, Xiaotian Du^D, Caroline R. Multari^D, Yaqing Ning^D, Cristiano Palego, Xi Luo^D, Vahid Gholizadeh^D, Xuanhong Cheng and **James C. M. Hwang**^{LF}, “Broadband Single-Cell Detection with a Coplanar Series Gap,” *IEEE ARFTG Proceedings.*, Atlanta, GA, 1-3, 2015. [-/9]
16. Yaqing Ning^D, Xiao Ma^D, Caroline R. Multari^D, Xi Luo^D, Vahid Gholizadeh^D, Cris Palego, Xuanhong Cheng and **James C. M. Hwang**^{LF}, “Improved broadband electrical detection of individual biological cells,” *IEEE MTT-S Int. Microwave Symp. (IMS) Digest*, Phoenix, AZ, May 17, 2015, DOI: 10.1109/MWSYM.2015.7166722, 1-3. [-/8]
17. Xiao Ma^D, Xiaotian Du^D, Caroline R. Multari^D, Yaqing Ning^D, Cristiano Palego, Xi Luo^D, Vahid Gholizadeh^D, Xuanhong Cheng, and **Jim C. M. Hwang**^{LF}, “Reproducible broadband measurement for cytoplasm capacitance of a biological cell,” *IEEE MTT-S*

- International Microwave Symposium (IMS) Digest*, San Francisco, CA, May 2016, pp. 1–3. [-/13]
18. Hang Li^P, Xiao Ma^D, Xiaotian Du^D, Xuanhong Cheng, and **James C. M. Hwang**^{LF}, “High-frequency Continuous-wave Electroporation of Jurkat Human Lymphoma Cells,” *IEEE MTT-S International Microwave Symposium (IMS) Digest*, San Francisco, CA, May. 2016, pp. 1–4. [-/4]
 19. Xiaotian Du^D, Xiao Ma^D, Hang Li^P, Vahid Gholizadeh^D, Xi Luo^D, Xuanhong Cheng, and **James C. M. Hwang**^{LF}, “Preliminary results for broadband electrical detection of bacteria,” *Proceedings of the IEEE Lester Eastman Conference High Performance Devices*, Bethlehem, PA, Aug. 2016, pp. 1–3. [-/-]
 20. Agnese Denzi, Caterina Merla, M. Casciola, James C. M. Hwang^{LF}, Xuanhong. Cheng, Francesca Apollonio and **Micaela Liberti**, “Microchambers for cell exposure: From the design to applications,” *Proceedings of the International Conference of IEEE Engineering Medicine Biology Society (EMBC)*, Orlando, FL, Aug. 2016, pp. 1-4. [-/1]
 21. Richard Al Hadi, Yan Zhao, M-C. **Frank Chang**, Xuanhong Cheng and James C. M. Hwang^{LF}, “On-chip terahertz signal generators for near-field biosensor arrays,” *Proceedings of the Radio-Frequency Integration Technology (RFIT), 2016 IEEE International Symposium*, Aug. 24, 2016. [-/-]
 22. Hang Li^P, Xiao Ma^D, Xiaotian Du^D, Yaqing Ning^D, **Xuanhong Cheng** and **James CM Hwang**^{LF}, “Correlation between morphology change and microwave property during single-cell electroporation,” *Proceedings of the Microwave Symposium (IMS), 2017 IEEE MTT-S International*, 869-871. [-/4]
 23. Thomas Reidy^M, Zhibo Cao^M, Guanyang Xue^D, Danli Luo and **Xuanhong Cheng**, “Nanoparticles Enrichment in Microfluidic Thermal Gradient Device,” *Proceedings of the Biomedical Engineering Society Meeting*, Phoenix AZ, Oct. 11, 2017 [-/-]
 24. Yi Wang^D, Keely Heintz, Kieren Connor^U and **Xuanhong Cheng**, “Sandwich PDMS Membrane Device for HIV Capture and Concentration Test,” *Proceedings of the Biomedical Engineering Society Meeting*, Phoenix AZ, Oct. 11, 2017 [-/-]
 25. Yi Wang^D, Wei Zhang^D, Whitney Lai^M, Yan Xu^D, X. Frank Zhang^{LF} and **Xuanhong Cheng**, “Unfolding Behavior of Von Willebrand Factor (VWF) Multimer and Fragments,” *Proceeding of the Biomedical Engineering Society Meeting*, Phoenix AZ, Oct. 11, 2017 [-/-]
 26. Priyokti Rana^U, Thomas Reidy^M and **Xuanhong Cheng**, “Characterization of the Clogging Effect in Polydimethylsiloxane (PDMS) through Thermal Aging,” *Proceedings of the Biomedical Engineering Society Meeting*, Phoenix AZ, Oct. 11, 2017. [-/-]
 27. Witney Lai^M, Yi Wang^D, Xuanhong Cheng and **Frank Zhang**^{LF}, “Biomechanical Characterization of von Willebrand Factor and Its Mutant,” *Proceeding of the Biomedical Engineering Society Meeting*, Phoenix AZ, Oct. 11, 2017. [-/-]
 28. Nastaran Gholizadeh, Xiao Ma^D, Hang Li^P, Xiaotian Du^D, Yaqing Ning^D, Vahid Gholizadeh^D, Xuanhong Cheng and **James C.M. Hwang**^{LF}, “Ultra-wideband electromagnetic detection of biological cells,” *Proceedings of the IEEE Microwave Measurement Conference (ARFTG), 2017 89th ARFTG*, Jun. 9, 2017. [-/2]
 29. Zeng Xie^P, Yifeng Qian^D, Yongkang Gao^D, Hang Li^P, Sushi Kumar^{LF}, Qiaoqiang Gan, Xuanohng Cheng and **Filbert Bartoli**^{LF}, “On-chip detection of immune-cell secretion using a circular nanoplasmonic interferometer array,” *Proceedings of CLEO: Science and Innovations, Optical Society of America.*, San Jose, CA, May 2017; p SM1C. 5. 2017. [-/-]

30. Chunqiao Dong^D, Wei Wei^D, Michael Morabito^D, **Edd Webb**^{LF}, Alp Oztekin^{LF}, Frank X. Zhang^{LF} and Xuanhong Cheng, “Modeling Shear Induced Von Willebrand Factor Binding to Collagen,” *Bulletin of the American Physical Society*, New Orleans, Mar. 2017. [-/-]
31. Xiao Ma^D, Xiaotian Du^D, Nastaran Gholizadeh, Vahid Gholizadeh^D, Hang Li^P, Xuanhong Cheng and **James CM Hwang**^{LF}, “One resistor and two capacitors: An electrical engineer's simple view of a biological cell,” *Proceedings of the Advanced Materials and Processes for RF and THz Applications (IMWS-AMP), 2017 IEEE MTT-S International Microwave Workshop Series*, Sept. 20-22, 2017. [-/2]
32. Justin Jahnke, Jessica Terrell, Austin Smith, Xuanhong Cheng and **Dimitra Stratis-Cullum**, “Spatiotemporal dynamics of filamentous bacteria near and on affinity substrates,” *Abstracts of Papers of the American Chemical Society*, Aug. 20, 2017. [-/-]
33. Xiaotian Du^D, Xiao Ma^D, Hang Li^P, Xuanhong Cheng and **James C. M. Hwang**^{LF}, “Ultra-wideband characterization, electroporation, and dielectrophoresis of a live biological cell using the same vector network analyzer”, *Proceedings of the 2018 IEEE/MTT-S International Microwave Symposium-IMS*, 1148-1151. [-/3]
34. Xiaotian Du^D, Xiao Ma^D, Hang Li^P, Yaqing Ning^D, Xuanhong Cheng and **James C.M. Hwang**^{LF}, “Validation of Clausius-Mossotti Function in Single-Cell Dielectrophoresis,” *Proceedings of the 2018 IEEE International Microwave Biomedical Conference (IMBioC)*, Jun. 14, 2018. [-/4]
35. Yi Wang^D, Wenpeng Cao^D, Luke Egan, X. Frank Zhang^{LF}, and **Xuanhong Cheng**, “Conformational Change of von Willebrand Factor (vWF) under Shear Flow in Microfluidic Devices,” *Proceedings of the Biomedical Engineering Society Meeting*, Oct. 19, 2018. [-/-]
36. Danli Luo^D, Guanyang Xue^D and **Xuanhong Cheng**, “Nanoparticle Focusing by Coupling Thermophoresis and Engineered Vortex in Microfluidic Device,” *Proceedings of the Biomedical Engineering Society Meeting*, Oct. 18, 2018. [-/-]
37. Yifeng Qian, Yu-Han Ho, Sushil Kumar, **Xuanhong Cheng** and **Filbert Bartoli**, “Nanoplasmonic Interferometric Sensor for Multiplex Detection of MMP-9 and TIMP-1,” *CLEO: Applications and Technology*, AM4I.2, May 5, 2019. [-/-]
38. Yi Wang, Michael Morabito, Avani Pisapati, Ciara Kavanagh, Xiaohui F. Zhang, Edmund Webb III, Alparslan Oztekin, and Xuanhong Cheng, “Shear-Induced Extensional Behaviors of Tethered Von Willebrand Factor,” *Proceedings of the Biomedical Engineering Society Meeting*, Oct. 18, 2019.
39. Caroline A. Ladegard, Xuanhong Cheng, “Sheath Flow Focusing of Jurkat Cells for Electrical Impedance Probing,” *Proceedings of the Biomedical Engineering Society Meeting*, Oct. 18, 2019.
40. Ashleigh Crawford, Jannah Wing, Maria Lancia, Olivia O'Donnell, Paola Lopez, Jaro Perera, Nattapat Dream Intarachumnum, Xuanhong Cheng, “Low-Cost, Point-of-Care Sickle Cell Anemia Screening Device for Use in LMICs,” *Proceedings of the Biomedical Engineering Society Meeting*, Oct. 19, 2019.

- **Edited Publications and Other Articles**

41. Andy Riegel, Xuanhong Cheng, Esmeel Naemi, Heather Canavan, Maxine Grobman, David Castner, and **Buddy Ratner**, “Preparation of 16-Mercapto-N-isopropylhexadecanamide (C16

NIPAM thiol): A “Smart” Molecule for Cell Sheet Engineering Substrate,” *Journal of Undergraduate Research in Bioengineering*, 5, 36-43 (2005). [-/-]

42. J.L Espinosa, Heather Canavan, Xuanhong Cheng, David Castner and **Buddy Ratner**, “Mixed n-Isopropylacrylamide Self-assembled Monolayer: Characterization and Optimization of a Thermally Responsive Coating,” *Journal of Undergraduate Research in Bioengineering*, 4, 31-36 (2004). [-/-]
43. Max Greenfeld, Heather Canavan, Xuanhong Cheng, Buddy Ratner and **David Castner**, “Study of Confluent Cell Culture Monolayers by XPS and SIMS,” *Journal of Undergraduate Research in Bioengineering* (2004). [-/-]
44. Chao Zhao and **Xuanhong Cheng**, “Thermophoresis of Biomolecules and Bioparticles in Aqueous Solutions: A Mini Review”, *International Journal of Terraspace Science and Engineering* 6(1), 63-69 (2014). [-/-]

• **Original Designs, Plan, Inventions and Patents**

1. Buddy D. Ratner^{DA}, Xuanhong Cheng, Yanbing Wang, Yael Hanein, Ashutosh Shastry and Karl F. Böhringer, “Apparatus and Methods for Binding Molecules and Cells,” filed, OTL Ref. No.'s 2061-3773-4435PT (U.S.) & 2061-3773-4437PT (PCT), Jul. 30, 2003.
2. Murat Tunc, Xuanhong Cheng, Buddy D. Ratner^{DA}, Ellis Meng and Mark Humayun, “Reversible Attachment of Retinal Implants, Other Implants and Drug Delivery Devices,” filed November 29, 2007, US patent No. 60/867,668
3. Mehmet Toner^{PA}, William Rodriguez^{PA}, Xuanhong Cheng, Daniel Irimia, Meredith Dixon, Kazuhiko Sekine, Utkan Demirci, Lee Zamir, Ronald G. Tompkins, “A Microfluidic Chip for CD4+ T Cell Count Based on Flow Assisted Cell Affinity Isolation,” US patent, 2006, US patent application No. 60/782,470
4. Rashid Bashir, Mehmet Toner^{PA}, Xuanhong Cheng, William Rodriguez^{PA}, “Methods for Detecting Cells and Other Analytes,” US patent filed, September 15, 2008, US patent application No. 12/293,046
5. William Rodriguez^{PA}, Xuanhong Cheng, Grace Chen and Mehmet Toner^{PA}, “System for Detecting Nanoparticles and Viruses,” invention disclosure filed, Mar 18, 2008
6. Daniel Ouyang^{LF} and Xuanhong Cheng, “Opto-fluidic Nanoparticle Detection Apparatus,” US patent PCT Pub. No. WO2009/108921, PCT Pub. No. WO2009/108921, August 28, 2013, US patent No. 8,537,356, application No. 12/920,262.
7. William Rodriguez^{PA}, Aaron Oppenheimer, Rashid Bashir, Nicholas Watkins, Xuanhong Cheng, Mehmet Toner^{PA}, and Grace Chen, “Methods for Counting Cells,” US patent, EP 2156376 B1
8. Chao Zhao^D, Alp Oztekin^{LF} and Xuanhong Cheng, “Microfluidic Concentrator for Label-Free, Continuous Nanoparticle Processing”, US Patent App. 15/343,784

C. HONORS AND AWARDS

- ***Recognition by Professional and Academic Societies***

Society For Biomaterials 2004 Student Award for Outstanding Research (Ph.D. category), 7th World Biomaterials Congress, Sydney Australia, 2004 (1 awardee each year among all students worldwide in the biomaterials research)

Outstanding Graduate Female of Society of Women Engineers, University of Washington, Seattle WA, 2004 (1 graduate awardee per department among over 50 female graduate students)

Young Investigator Award, 15th Conference on Retroviruses and Opportunistic Infections, Boston MA, 2008 (~150 awardees among 3000 participants)

GHDx/PATH Fellowship for a Fieldtrip to Kenya, December 2009

- ***Awards for Best Paper and Book***

Honorable Mention, Society for Biomaterials 28th Annual Meeting, Tampa FL, 2002

Honorable Mention, Society for Biomaterials 29th Annual Meeting, Reno NV, 2003

Poster of Distinction Travel Award, Massachusetts General Hospital Scientific Advisory Board, Boston MA, 2007 (2 Awardees per discipline among over 100 participants)

People's Award and 2nd Place Poster Award, the 2015 David and Lorraine Freed Undergraduate Research Symposium (Advisor: Cheng; undergraduate students: Kathryn Kundrod and John Fraser)

First Place in NIH Undergrad DEBUT Design Competition, 2015 (Advisor: Cheng; undergraduate students: Kathryn Kundrod and John Fraser)

Finalist Presentation in Collegiate Inventors Competition, 2015 (Advisor: Cheng; undergraduate students: Kathryn Kundrod and John Fraser)

Parenteral Drug Association Award at the Delaware Valley Science Fair, 2014 (Advisor: Cheng; high school student: Jane Sharkey)

First place at the Lehigh Valley Science and Engineering Fair and 1st place at the Pennsylvania Junior Academy of Science regional competition, 2018 (Advisor: Buceta and Cheng; high school student: Anki Pinki Manju)

- ***Teaching Awards and Other Special Recognitions***

Appointed Rossin Assistant Professor, March 2010

Appointed Class 61' Associate Professor, 2017

D. RESEARCH FUNDING AND TRAINING GRANTS

- **Competitively Awarded Research Grants**

Extramural Funding

National Science Foundation \$300,000 12/01/2009-11/30/2011

Title: *Investigation of Microsphere Convective Deposition for Photonic and Biological Applications*

Description: This project will design microbead monolayer crystals to study cell adhesion

Investigators: Jim Gilchrist (PI), **Xuanhong Cheng** (Co-PI, 20%) and Nelson Tansu (Co-PI)

GHDx/PATH Fellowship for a Fieldtrip to Kenya Awarded 12/07/2009-12/11/2009

Title: *Opportunity for Engineers to Obtain First-Hand Experience in Point-of-care Diagnosis*

Description: This fellowship support the field trip of engineers to visit clinics in Africa to design end-user targeted diagnostics

Investigators: **Xuanhong Cheng** (PI, 100%)

National Institute of Health (R21) \$404,558 07/01/2009-06/30/2011

Title: *A microfluidic Device for HIV Viral Count at Point of Care Settings*

Description: This project will create a portable device to count HIV viruses from plasma samples

Investigators: **Xuanhong Cheng** (PI, 70%), Wojciech Misiolek (Co-PI), Willam van Geertruyden (Consultant), William Rodriguez (Consultant), Timothy Friel (Consultant) and Martin Hirsch (Consultant)

PA Department of Health CURE Formula Fund 100,000 01/01/2010-12/31/2012

Title: *An Optical-Microfluidic Hybrid System for Whole Particle Viral Detection*

Description: This project will build an imager to count HIV viruses

Investigators: **Xuanhong Cheng** (PI, 60%), Daniel Ou-Yang (Co-PI) and Tim Friel (Co-PI)

National Science Foundation-IDR \$600,000 09/01/2010-08/31/2012

Title: *Multiplex Plasmonic Sensing for Dynamic Cell-based Biomolecular Assays*

Description: This project will explore the use of nanoplasmonic sensors to study neural stem differentiation

Investigators: Fil Bartoli (PI), **Xuanhong Cheng** (Co-PI, 30%) and Sabrina Jedlicka (Co-PI)

National Science Foundation-SNM \$1,000,000 09/01/2010-08/31/2012

Title: *Technologies for Nanoparticle Monolayer Self-Organization and Deposition*

Description: This project will explore the applications and scale-up methods of nanoparticle monolayers.

Investigators: James Gilchrist (PI), Mark Snyder (Co-PI), Nelson Tansu (Co-PI), Jeetain Mittal (Co-PI), **Xuanhong Cheng** (Co-PI, 10%)

Defense Threat Reduction Agency \$1,000,000 02/01/2012-05/30/2013

Title: *Compact, Fast Intracellular Bio-Detection by Integrated Nanopulse Generator and Planar Microchamber*

Description: This project aims to detect pathogens and cells using nanopulse electrical sensors.

Investigators: James Hwang (PI) and **Xuanhong Cheng** (Co-PI, 40%)

Percentage in the parenthesis: contribution to the project

National Science Foundation -Collaborative Research \$253,799 09/01/2013-08/31/2016

Title: Efficient Rare Cell Capturing in Microfluidic Devices via Multiscale Surface Design

Description: This project will develop microdevices with multiscale surface features to enhance the efficiency of rare cells from blood.

Investigators: Yaling Liu (PI) and **Xuanhong Cheng** (Co-PI, 25%)

Army Research Office \$750,000 10/01/2014-09/30/2019

Title: Research Area 4.1 Nano- and Bio-Electronics: Fundamental Theoretical and Experimental Study of Nanoporation of Biological Cells by Novel Electrical/Optical Detection and Imaging

Description: This proposal will develop electrical sensors to study nanoporation on single neurons.

Investigators: James Hwang (PI) and **Xuanhong Cheng** (Co-PI, 40%)

National Science Foundation \$300,000 09/01/2015-08/31/2020

Title: Nanoplasmonic Interferometric Sensor Array for Dynamic Multiplexed Functional Array of White Blood Cells

Description: This project intends to build optical sensors to monitor secretion activity of single white blood cells

Investigators: Filbert Bartoli (PI) and **Xuanhong Cheng** (Co-PI, 40%)

National Science Foundation \$305,798 06/15/2015-05/31/2020

Title: Coupling Thermophoresis with Engineered Convection for Label free, Continuous Bionanoparticle Concentration in Microfluidic Devices

Description: This project intends to develop microfluidic devices to process viral samples

Investigators: **Xuanhong Cheng** (PI, 70%) and James Gilchrist (Co-PI)

National Science Foundation \$1,161,993 09/01/2015-08/31/2019

Title: Mechano-Biologically Informed Molecular Models of Flow Sensitive Biopolymers

Description: This project intends to study the conformational stability of vWF under different shear conditions.

Investigators: Ed Webb (PI), Alp Oztekin (Co-PI), Frank Zhang (Co-PI) and **Xuanhong Cheng** (Co-PI, 20%)

National Science Foundation \$12,000 05/26/2016-05/31/2019

Title: REU Supplement UNS: Coupling Thermophoresis with Engineered Convection for Label free, Continuous Bionanoparticle Concentration in Microfluidic Devices

Description: This project intends to support summer undergraduate research about nanoparticle separation

Investigators: **Xuanhong Cheng** (PI, 100%)

PA Department of Health CURE Formula Fund \$100,000 09/01/2016-12/31/2019

Title: Optofluidic Nanocytometry for Characterization of Whole Particle *Viruses*

Description: This project will build a sample processing device integrated with a biosensor to detect viruses in solutions.

Investigators: **Xuanhong Cheng** (PI, 40%), Alp Oztekin (Co-PI) and Chao Zhou (Co-PI)

National Science Foundation I-Corps \$50,000 01/01/2016-10/31/2016

Title: NanoFocus Team--Commercialization of a Nanoparticle Concentration Apparatus

Description: This project carried out market analysis for a viral processing device developed in the Cheng laboratory.

Investigators: **Xuanhong Cheng** (PI, 100%), Chao Zhao (Entrepreneur Lead) and Harvey Homan (Business Mentor)

VentureWell \$5,000 07/01/2016-06/30/2017

Title: Cyclic Solutions E-Team

Description: This grant support students to attend a workshop on commercializing a viral detection biosensor developed at Lehigh.

Investigators: **Xuanhong Cheng** (PI, 0%), Kieren Connor, John Fraser and Kaylynn Genemaras

Air Force Office of Scientific Research \$300,000 07/01/2016-06/30/2017

Title: Acquisition of a Broadband Analyzer for Research on MEMS, Transistors and Biological Cells

Description: This proposal will acquire a broadband network analyzer for the analysis of various subjects.

Investigators: James Hwang (PI) and **Xuanhong Cheng** (Co-PI, 10%)

Army Research Lab. Research Professorship Program \$30,000 06/01/2016-08/15/2016

Title: Biological Microelectromechanical Systems (BioMEMS) for Fundamental Studies of Bacterial-Inorganic Interfaces and Applications

Description: This proposal supports Cheng to collaborate with ARL in summer 2016

Investigators: **Xuanhong Cheng** (PI, 100%)

National Science Foundation-ECCS \$350,000 07/01/2018-06/31/2021

Title: Broadband Electrical Sensing of Nuclear Morphology and DNA Content in a Single Live Cell

Description: This project will build electrical sensors to study intracellular physics especially the properties of the cell nucleus

Investigators: **Xuanhong Cheng** (PI, 60%) and James Hwang (Co-PI)

VentureWell \$5,000 07/01/2019-06/30/2020

Title: SickLED E-Team

Description: This grant support students to attend a workshop on commercializing a diagnostic device for sickle cell disease.

Investigators: **Xuanhong Cheng** (PI, 0%), Jannah Wing, Maria Lancia and Ashley Crawford

Intramural Funding

Lehigh University Faculty Development Fund \$2,500 12/01/2008-11/31/2009

Title: *Nanoporous Membranes for Whole Particle Viral Processing and Detection at the Point of Care*

Description: This project will develop a ceramic membrane material to isolate viruses from biological samples.

Investigators: **Xuanhong Cheng** (PI, 100%)

Biosystems Dynamics Summer Institute Fund \$30,000 07/01/2009-09/30/2009

Title: *Isolation and Analysis of Rare Cells from Biological Fluids Using a Reversible Cell Capture Platform*

Description: This project will build a microfluidic system to reversibly capture and release cells for cell function assays.

Investigators: **Xuanhong Cheng** (PI, 50%), James Gilchrist (Co-PI)

- Lehigh University Faculty Innovation Grant 25,000 06/01/2010-05/31/2011
 Title: *An Optofluidic Platform towards Dynamic, Label Free Analysis of Single Cell Function*
 Description: This project will build a biosensor to detect cell secretory behavior
 Investigators: **Xuanhong Cheng** (PI, 100%)
- Biosystems Dynamics Summer Institute Fund \$58,000 07/01/2010-09/30/2010
 Title: *Fabrication of Nanoporous Membranes for Bio-separation*
 Description: This project will create novel nanoporous membranes for bioparticle purification
 Investigators: **Xuanhong Cheng** (PI, 50%) James Gilchrist (Co-PI)
- Lehigh University Faculty CORE Grant 60,000 06/01/2013-05/31/2014
 Title: Point-of-Need Electrical Identification of Biological Cells
 Description: This project will build broadband electrical biosensors to detect viability and identify of biological cells.
 Investigators: **Xuanhong Cheng** (PI, 40%), Bryan Berger (Co-PI) and James Hwang (Co-PI)
- Lehigh University CREF Grant 150,000 2013, 2014
 Title: A Suite of Instruments for the Tissue Culture and Soft-Lithography Facilities at the Health Research Hub (HRH)
 Description: These proposals intend to equip the tissue culture, clean room and optical microscope facility at HRH.
 Investigators: Anand Jagota (PI), **Xuanhong Cheng** (Co-PI, 0%), Bryan Berger (Co-PI), Chris Kiely (Co-PI), Sushil Kumar (Co-PI), Svetlana Tatic-Lucic (Co-PI) and Rick Vinci (Co-PI)
- Pennsylvania Infrastructure Technology Alliance (PITA) \$50,000 01/01/2018-06/30/2019
 Title: Characterization of Autologous Human Mesenchymal Stem Cells: Towards Improving Patient Outcomes
 Description: This proposal intends to create microfluidic devices to separate human mesenchymal stem cells and characterize their phenotype and genotype
 Investigators: Sabrina Jedlicka (PI) and **Xuanhong Cheng** (Co-PI, 10%)
- Lehigh University CORE Grant \$60,000 05/01/2018-12/30/2019
 Title: Thermophoresis in non-Newtonian fluids for bioseparations
 Description: This proposal intends to study temperature gradient driven migration of nanoparticles of different shapes in non-Newtonian fluids
 Investigators: Kelly Shultz (PI), James Gilchrist (Co-PI) and **Xuanhong Cheng** (Co-PI, 0%)
- Lehigh University CREF Grant \$220,000 01/01/2020-12/30/2020
 Title: Acquisition of NanoTemper Monolith NT.115Pico for Molecular Binding Affinity Measurements
 Description: This proposal intends to acquire an instrument for the Health Research Hub core facility
 Investigators: **Xuanhong Cheng** (PI), Angela Brown, Lesley Chow, Anand Jagot, Yaling Liu, Thomas Pashuc, Mark Snyder, Dimitrios Vavylonis, Frank Zhang
- Lehigh PITA Grant \$80,000 01/01/2020-08/30/2021
 Title: Characterization of Polymers Solutions and Colloidal Suspensions in a Temperature Field
 Description: This proposal intends to study how polymer and and colloid solutions behave under a temperature gradient towards quality control commercial products based on these

solutions.
Investigators: **Xuanhong Cheng** (PI), Wei Gao (Co-PI)

E. EDITOR/EDITORIAL REVIEW BOARD MEMBERSHIP FOR SCHOLARLY PUBLICATIONS

Guest-editor for the journal of Micromachines on a special issue of “Micro- and Nanofluidics for Biological Nanoparticle Analysis,” June 2018 - June 2019.

F. SCHOLARLY PRESENTATIONS

- *Invited Presentations/Lectures/Colloquia/Workshops/Performances/Conferences*

1. **Xuanohng Cheng**, Yanbing Wang, Karl Bohringer and Buddy Ratner^{DA}, “Thermally Responsive Surfaces for Cell and Protein Technology by RF-Plasma Deposition,” 227th American Chemical Society National Meeting and Exhibition, Anaheim, CA, March 29, 2004.
2. **Xuanohng Cheng**, Yanbing Wang, Karl Bohringer and Buddy Ratner^{DA}, “Plasma Polymerized Thermoresponsive pNIPAM Coatings: Characterizations and Applications,” Institute of Materials Research and Engineering Student Workshop, Singapore, February 14, 2004.
3. **Xuanhong Cheng**, Yanbing Wang, Karl Bohringer and Buddy Ratner^{DA}, “Smart Polymer by Plasma Deposition and Applications,” Kimberley Clark Inc. (Corporate Research Department), Atlanta, GA, October, 2004.
4. **Xuanohng Cheng**, William Rodriguez^{PA} and Mehmet Toner^{PA}, “Microchips for biology and Medicine,” Lehigh Center for Advanced Materials and Technology, Bethlehem, PA, Feb. 21, 2008.
5. **Xuanohng Cheng**, William Rodriguez^{PA} and Mehmet Toner^{PA}, “Small tools for big problems: microfabricated chips for global health AIDS diagnostics,” Arizona State University, Tempe, AZ, Feb. 22, 2008.
6. **Xuanohng Cheng**, William Rodriguez^{PA} and Mehmet Toner^{PA}, “Microchips for Diagnosis,” Lehigh Biological Sciences Colloquium Seminar Series, Bethlehem, PA, Apr. 9, 2008.
7. **Xuanohng Cheng**, William Rodriguez^{PA} and Mehmet Toner^{PA}, “Point of Care HIV/AIDS Diagnostics Using MEMS Technology,” Center of Optics 7th Annual Open House, Lehigh University, Bethlehem, PA, Oct. 14, 2008.
8. **Xuanohng Cheng**, William Rodriguez^{PA} and Mehmet Toner^{PA}, “Microfluidic devices for HIV/AIDS Monitoring,” Boston University, Boston, MA, Dec. 4, 2008.
9. **Xuanohng Cheng**, William Rodriguez^{PA} and Mehmet Toner^{PA}, “MEMS Technology for Global Health Diagnostics,” Dalian University of Technology, Dalian, China, Jan. 7, 2009.
10. **Xuanohng Cheng**, William Rodriguez^{PA} and Mehmet Toner^{PA}, “Microfabricated Chips for Point-of-Care Applications,” Wuhan University, Wuhan, China, Jan. 5, 2009.
11. **Xuanohng Cheng**, “Immunoaffinity Cell Isolation Chip, Designs and Applications,” University of Akron, Akron, OH, Mar 4, 2010
12. **Xuanhong Cheng**, “Microfluidic Devices for Analysis of Bioparticles,” EPI Open House, Lehigh University, Bethlehem, PA, May 7, 2010
13. **Xuanohng Cheng**, “Microchips for Point of Care Blood Analysis,” Mayo Clinic, Rochester, MN, Oct. 18, 2010.
14. **Xuanohng Cheng**, “Microfluidics for Blood Analysis,” Northeastern University, Boston, MA, Dec. 2, 2010.

Each author annotated with P=postdoctoral researcher, D=Lehigh Doctoral student, M=Lehigh Master’s student, U=Lehigh Undergraduate student, DA=Cheng’s doctoral adviser, PA=Cheng’s postdoctoral adviser, LF=other Lehigh faculty, bold=presenter.

15. **Xuanhong Cheng**, “Microfluidics for Blood Processing and Bioparticle Detection,” Academia Sinica, Taipei, Taiwan, Dec. 17, 2010.
16. **Xuanhong Cheng**, Shu-han Wu, Pei-kun Wei, Authur Chiou and Peikun Wei, “Nanoplasmonic Sensors for Live Cell Function Analysis,” Canadian Congress of Applied Mechanics, Vancouver, BC, June 5-7, 2011.
17. **Xuanhong Cheng**, “Microfluidic Diagnostics for Cell Analysis towards Point-of-care Applications,” City University of New York, New York City, NY, Mar. 8, 2012.
18. **Xuanhong Cheng**, “Nanoplasmon Based Opto-fluidic Platform for Molecular and Cellular Analysis,” Shenzhen University, Shenzhen, China, Dec. 20, 2012.
19. **Xuanhong Cheng**, “Blood Analysis on a Chip,” Dalian University of Science and Technology, Dalian, China, Dec. 28, 2012.
20. **Xuanhong Cheng**, “Microfluidics and Biosensors for Cell and Microorganism Analysis,” East China University of Science and Technology, Shanghai, China, Jun. 13, 2014.
21. **Xuanhong Cheng**, “Cell Detection by a Microfluidic-Integrated Broadband Biosensor,” TechConnect 2014, Washington DC, June 18, 2014
22. **Xuanhong Cheng** and **James Hwang**^{LF}, “Broadband Electrical Detection of Individual Biological Cells,” Army Research Laboratory, Adelphi, MD, January 13, 2015
23. **Xuanhong Cheng** and **James Hwang**^{LF}, “Broadband Electrical Detection of Individual Biological Cells,” Defense Threat Reduction Agency, Ft Belvoir, VA, March 18, 2015
24. **Xuanhong Cheng** and **James Hwang**^{LF}, “Broadband Electrical Detection of Individual Biological Cells,” Johns Hopkins Applied Physics Lab, Laurel, MD, December 10, 2015
25. **Xuanhong Cheng** and **James Hwang**^{LF}, “Broadband Electrical Detection of Individual Biological Cells,” Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences, Shanghai, P. R. China, March 17, 2016
26. **Xuanhong Cheng**, “Microfluidic Devices for Viral Sample Processing,” University of Science and Technology of China, Hefei, Anhui, P. R. China, March 21, 2016
27. **Xuanhong Cheng**, “Microfluidic Devices for Biological Sample Processing,” Shanghai Industrial Micro-Technology Research Institute, Shanghai, P. R. China, December 27, 2016
28. **Xuanhong Cheng**, “Microfluidic Diagnostics for Analysis of Cell and Viruses in Infectious Diseases,” 1st Oriental Conference on Clinical Diagnostics, Shanghai, China, July 14, 2017
29. **Xuanhong Cheng**, “Biosensing of Cells and Pathogens with Broadband Electrical Sensors,” 2017 US-Brazil Workshop on Biosensors: Bioanalytics to Device Integration, Sao Paulo, Brazil, November 9, 2017
30. **Xuanhong Cheng** and **James Hwang**^{LF}, “Broadband Electromagnetic Characterization of Individual Biological Cells and Subcellular Structures,” Rowan University, Stratford, NJ, August 15, 2017
31. **Xuanhong Cheng** and **James Hwang**^{LF}, “Ultra-wideband Impedance Spectroscopy of Live Biological Cells,” University of Pennsylvania, Philadelphia, PA, Dec. 13, 2017
32. **Xuanhong Cheng**, “Continuous Bionanoparticle Focusing under a Temperature Field,” 2nd International Conference of Microfluidics, Nanofluidics and Lab on a Chip, Beijing, China, June 10, 2018.

33. **Xuanhong Cheng**, “Label Free Analysis of Single Cell Properties and Cell Secretory Signals”, Beijing University of Chemical Technology, Beijing, China, June 12, 2018
34. **Xuanhong Cheng**, “Conformational of von WillebrandFactor (vWF) under Shear Flow,” Georgia Institute of Technology, Atlanta, GA, Oct. 17, 2018
35. **Xuanhong Cheng**, “Label-Free Separation and Detection of Biological Analytes,” Beijing University of Chemical Technology, Beijing, China, Dec. 20, 2019

- ***Refereed Presentations/Lectures/Exhibits/Performances/Conferences***

36. **Xuanhong Cheng**, Yanbing Wang, Yael Hanein, Karl Bohringer and Buddy D. Ratner^{DA}, “Temperature-Responsive Polymer Coatings by Plasma Polymerization and the Applications for Protein and Cell Patterning,” American Vacuum Society 49th International Symposium, Denver, CO, November 4-8, 2002.
37. **Xuanhong Cheng**, Yanbing Wang, Yael Hanein, Karl Bohringer and Buddy D. Ratner^{DA}, “Synthesis of Temperature-Responsive Polymer Coatings by Plasma Polymerization and the Protein Adsorption Properties,” Society for Biomaterials 28th Annual Meeting, Tampa, FL, April 24-27, 2002.
38. **Buddy D. Ratner^{DA}**, Xuanhong Cheng, Yanbing Wang, Yael Hanein and Karl F. Böhringer, “Temperature-Responsive Polymeric Surface Modifications by Plasma Polymerization: Cell and Protein Interactions,” 225th American Chemical Society National Meeting, New Orleans, LA, March 23-27, 2003
39. **Xuanhong Cheng**, Yanbing Wang, Yael Hanein, Karl Bohringer and Buddy D. Ratner^{DA}, “Cell Behavior and Patterning on Plasma Polymerization Thermal Responsive Coatings,” Society for Biomaterials 29th Annual Meeting, Reno, NV, April 30-May 4, 2003.
40. **Yangbing Wang**, Xuanhong Cheng, Yael Hanein, Ashutosh Shastri, Denice D. Denton, Buddy D. Ratner^{DA}, Karl F. Böhringer, “Selective Attachment of Multiple Cell Types on Thermally Responsive Polymer,” 12th International Conference on Solid-State Sensors and Actuators (Transducers'03), Boston, MA, June 6-12, 2003. [/9]
41. **Heather E. Canavan**, Xuanhong Cheng, Buddy D. Ratner^{DA} and David G. Castner, “The Use of XPS, SIMS, and Immunostaining to Examine the Behavior of Extracellular Matrix upon Cell Detachment from a Smart Polymer,” 50th International Symposium of the American Vacuum Society, Baltimore, MD, November 2-7, 2003.
42. Max Greenfeld, Heather Canavan, **Xuanhong Cheng**, Dan Graham, Buddy Ratner^{DA}, David Castner, “Study of Confluent Cell Culture Monolayers by XPS and SIMS,” 51st International Symposium of the American Vacuum Society, Anaheim, CA, November 14-19, 2004.
43. **Heather Canavan**, Xuanhong Cheng, Buddy Ratner^{DA}, David Castner, “Surface Characterization of Extracellular Matrix upon Cell Detachment from a “Smart Polymer,” 7th World Biomaterials Congress, Sydney, Australia, May 17-21, 2004.
44. **Xuanhong Cheng**, Yanbing Wang, Yael Hanein, Karl Bohringer and Buddy D. Ratner^{DA}, “Proteins on Plasma Deposited Thermo-Responsive Polymer: Adsorption and Activity Study,” 7th World Biomaterials Congress, Sydney, Australia, May 17-21, 2004.
45. **Xuanhong Cheng**, Yanbing Wang, Yael Hanein, Karl Bohringer and Buddy D. Ratner^{DA}, “Proteins on Plasma Deposited Thermo-Responsive Polymer: Adsorption and Activity Study,” 7th World Biomaterials Congress, Sydney, Australia, May 17-21, 2004.

46. **David Castner**, Heather Canavan, Xuanhong Cheng, Dan Graham, Buddy Ratner^{DA}, “Development of SIMS as a Novel Investigative Tool for the Analysis of Cell Sheets and Their Extracellular Matrix Proteins,” 15th International Conference on Secondary Ion Mass Spectrometry (SIMS XV), Manchester, UK, September 12-16, 2005.
47. **David Castner**, Heather Canavan, Xuanhong Cheng, Dan Graham, Buddy Ratner^{DA}, “Development of SIMS as a Novel Investigative Tool for the Analysis of Cell Sheets and Their Extracellular Matrix Proteins,” 15th International Conference on Secondary Ion Mass Spectrometry (SIMS XV), Manchester, UK, September 12-16, 2005.
48. **Max Greenfeld**, Heather Canavan, Xuanhong Cheng, Dan Graham, Buddy Ratner^{DA}, David Castner, “Studying the Extracellular Matrix Using Ultra High Vacuum Surface Science,” 8th Annual UW Undergraduate Research Symposium, Seattle, WA, May 13, 2005
49. **Heather Canavan**, Xuanhong Cheng, Dan Graham, Buddy Ratner^{DA}, David Castner, “Analysis of Cell Sheets and their Extracellular Matrix Proteins after Non-destructive Removal from ppNIPAM,” 30th Annual Meeting of the Society For Biomaterials, Memphis, TN, April 27-30, 2005.
50. **Heather Canavan**, Xuanhong Cheng, Dan Graham, Buddy Ratner^{DA}, David Castner, “Identification of Residual ECM Proteins Retained at pNIPAM Surfaces using Time-of-Flight SIMS,” 52nd International Symposium of the American Vacuum Society, Boston, MA, October 30-November 4, 2005.
51. **Heather Canavan**, Max Greenfeld, Xuanhong Cheng, Dan Graham, Buddy Ratner^{DA}, David Castner “Use of Cell Sheet Engineering to Characterize Buried Biological Interfaces,” Regenerate World Congress on Tissue Engineering and Regenerative Medicine, Pittsburgh, PA, April 25-27, 2006.
52. **Heather Canavan**, Max Greenfeld, Xuanhong Cheng, Dan Graham, Buddy Ratner^{DA}, David Castner, “Surface Characterization of the ECM Proteins and Cell Sheets Released from a Thermoresponsive Polymer,” presented at the 20th European Conference on Biomaterials ESB2006, Nantes, France, September 27-October 1, 2006.
53. **Xuanhong Cheng**, Daniel Irimia, Meredith Dixon, Kazuhiko Sekine, Utkan Demirci, Lee Zamir, Ronald G. Tompkins, William Rodriguez^{PA} and Mehmet Toner^{PA}, “A Microfluidic Device for Practical Label-Free CD4+ T Cell Counting of HIV-Infected Subjects,” MicroTAS2006, Tokyo, Japan, November 5-9, 2006.
54. **Xuanhong Cheng**, Daniel Irimia, Meredith Dixon, Kazuhiko Sekine, Utkan Demirci, Lee Zamir, Ronald G. Tompkins, William Rodriguez^{PA} and Mehmet Toner^{PA}, “Label-Free CD4+ T Cell Counting for Management of HIV-Infected Subjects in Resource Poor Settings,” Biomedical Engineering Society Annual Fall Meeting, Chicago, IL, October 11-14, 2006.
55. **Xuanhong Cheng**, Yi-shao Liu, Daniel Irimia, Utkan Demirci, Liju Yang, Lee Zamir, William R. Rodriguez^{PA}, Mehmet Toner^{PA} and Rashid Bashir, “Cell Detection and Counting through Cell Lysate Impedance Spectroscopy in Microfluidic Devices,” Biomedical Engineering Society Annual Fall Meeting, Los Angeles, CA, September 25-28, 2007.
56. **Xuanhong Cheng**, Daniel Irimia, Ronald Tompkins, Mehmet Toner^{PA} and William Rodriguez^{PA}, “An Improved Microfluidic Device for Point-of-care CD4+ T Cell Counting through Automated Monocyte Depletion,” Conference for Opportunistic Infections, Boston, MA, Feb 3-6, 2008.
57. **Yi Hu**^D, Joe Junio^D, Xuanhong Cheng and Daniel Ou-yang^{LF}, “Fluorescence Correlation Spectroscopy in an Optical Trap,” Conference on Lasers and Electro Optics 2010 Spring Annual Meeting, San Jose, CA, May 16-21, 2010.

58. **Bu Wang**^D, Pisist Kumnorkaew^D, Alex Weldon^D, Makenzie Wolfe^U, Christopher Tibaldi^U, James Gilchrist^{LF}, Xuanhong Cheng, “Study of Surface Roughness on Affinity-Based Cell Capture Efficiency in Microfluidic Devices,” Biomedical Engineering Society Annual Fall Meeting, Austin, TX, Oct. 6-9, 2010.
59. **Shuhan Wu**, Pei-kuen Wei, Arthur Chiou, Xuanhong Cheng, “Surface Plasmon Resonance for Dynamic Analysis of Cell Secreting Behavior,” Biomedical Engineering Society Annual Fall Meeting, Austin, TX, Oct. 6-9, 2010.
60. **Yi Hu**^D, Daniel Ou-yang^{LF} and Xuanhong Chneg, “Optically Forced Cytometry for Bio-nano-particle Enumeration (poster),” Biomedical Engineering Society Annual Fall Meeting, Austin, TX, Oct. 6-9, 2010.
61. **Krissada Surawathanawises**^D, Xuanhong Cheng, “Nanoporous Polyethylene Glycol Filtration Membranes Fabricated by Double Templating,” Materials Research Society Annual Fall Meeting, Boston, MA, Nov 29-Dec 3, 2010.
62. **Bu Wang**^D, Pisist Kumnorkaew^D, Alex Weldon^D, Makenzie Wolfe^U, Christopher Tibaldi^U, James Gilchrist^{LF} and Xuanhong Cheng, “Study of Surface Roughness on Affinity-Based Cell Capture Efficiency in Microfluidic Devices,” American Institute of Chemical Engineers Annual Fall Meeting, Salt Lake City, UT, Nov. 7-10, 2010.
63. **Yi Hu**^D, Daniel Ou-yang^{LF} and Xuanhong Cheng, “Whole Particle HIV Counting by Fluorescence Correlations Spectroscopy (poster),” Biomedical Engineering Society Annual Fall Meeting, Hartford, CT, Oct. 12-15, 2011.
64. **Chao Zhao**^D and Xuanhong Cheng, “Microfluidic separation of viruses from blood cells based on intrinsic transport processes,” Biomedical Engineering Society Annual Fall Meeting, Hartford, CT, Oct. 12-15, 2011.
65. **Pedro Soto**^U, Yi Hu^D, Daniel Ouyang^{LF} and Xuanhong Cheng, “Nanoparticle Counting under Continuous Flow by Optically Forced Cytometry (poster),” Biomedical Engineering Society Annual Fall Meeting, Hartford, CT, Oct. 12-15, 2011.
66. **Emily R. Geishecker**^M, Bu Wang^D, Susan F. Perry^{LF} and Xuanhong Cheng and Sabrina S. Jedlicka, “Shear induced C17.2 differentiation in a microfluidic environment (poster),” Society for Neurosciences Annual Meeting, Washington DC, Nov. 12-16, 2011.
67. **Bu Wang**^D, Sabrina Jedlicka^{LF} and Xuanhong Cheng, “Differentiation of Neural Stem Cells in Microfluidic Devices (poster),” Biomedical Engineering Society Annual Fall Meeting, Atlanta, GA, Oct. 24-27, 2012.
68. **Chao Zhao**^D and Xuanhong Cheng, “Interface Re-orientation in Density Stratified Microfluidic Flow with Nanoparticles (poster),” Biomedical Engineering Society Annual Fall Meeting, Atlanta, GA, Oct. 24-27, 2012.
69. **Caroline Multari**^D and Xuanhong Cheng, “Molecularly Imprinted Polymers for Viral Particle Capture (poster),” Biomedical Engineering Society Annual Fall Meeting, Atlanta, GA, Oct. 24-27, 2012.
70. **Matt Chu**^I, Caroline Multari^D and Xuanhong Cheng, “Reversible Capture and Release of Viral Particles by Molecularly Imprinted Polymer,” Biomedical Engineering Society Annual Fall Meeting, Atlanta, GA, Oct. 24-27, 2012.
71. **Shuhan Wu**, Arthur Chiou, Peikun Wei and Xuanhong Cheng, “Nanoplasmonic-microfluidic platform for real-time monitoring of live cell secretory activities (oral),” Biomedical Engineering Society Annual Fall Meeting, Seattle, WA, Sep. 26-29, 2013.

72. **Chao Zhao**^D, Alparslan Oztekin^{LF} and Xuanhong Cheng, “Measuring the thermal diffusion coefficients of artificial and biological particles in a microfluidic chip (oral),” American Physical Society Annual Fall Meeting, Pittsburg, PA, Nov. 24-27, 2013. [2]
73. **Cristiano Palego**^P, Caterina Merla, Yaqing Ning^{Dg}, Caroline R. Multari^D, Xi Luo^D, Xuanhong Cheng and James C. M. Hwang^{LF}, “Broadband Microchamber for Electrical Detection of Live and Dead Biological Cells,” IEEE MTT-S International Microwave Symposium, Seattle USA, Jun. 2-7, 2013.
74. **Yaqing Ning**^D, Cristiano Palego^P, Caterina Merla, Caroline Multari^D, David Molinero, Xi Luo^D, Xuanhong Cheng and James Hwang^{LF}, “Coplanar stripline microchamber for electrical detection of live and dead biological cells,” Microwave Conference (EuMC) 2013 European, Nuremberg, Germany, Oct. 6-10, 2013.
75. **Shuhan Wu**, Pei-kun Wei, Arthur Chiou and Xuanhong Cheng, “Real-time monitoring of MMP-9 secretion from monocytes using a nanoplasmonic-microfluidic platform,” American Association of Immunologists, Pittsburgh, PA, May 2-6, 2014.
76. **Agnese Denzi**, Merla Caterina, Yaqing Ning^D, Caroline Multari^D, Cristiano Palego, Xuanhong Cheng and James Hwang^{LF}, “Cell Detection and Discrimination by a Microfluidic-Integrated Broadband Microchamber,” 2014 European Microwave Symposium (EuMW-2014), Rome, Italy, Oct. 5-10, 2014.
77. **Bu Wang**^D and Xuanhong Cheng, “Enhancement of Binding Kinetics on Affinity Substrates by Laser Point Heating Induced Transport,” Biomedical Engineering Society Annual Meeting, Tampa, FL, Oct. 7-10, 2015.
78. **Krissada Surawathanawises**^D, Kathryn Kundrod^U and Xuanhong Cheng, “Microfluidic Devices with Regular Macroporous Structures for HIV Viral Capture,” Biomedical Engineering Society Annual Meeting, Tampa, FL, Oct. 7-10, 2015.
79. **Xiao Ma**^D, Xiaotian Du^D, Caroline R. Multari^D, Yaqing Ning^D, Cristiano Palego, Xi Luo^D, Vahid Gholizadeh^D, Xuanhong Cheng, and James C. M. Hwang^{LF}, “Broadband Single-Cell Detection with a Coplanar Series Gap,” 86th ARFTG Microwave Measurement Conference, Atlanta, GA, Dec. 1-4, 2015.
80. **Xiao Ma**^D, Xiaotian Du^D, Caroline R. Multari^D, Yaqing Ning^D, Cristiano Palego, Xi Luo^D, Vahid Gholizadeh^D, Xuanhong Cheng and Jim C. M. Hwang^{LF}, “Reproducible broadband measurement for cytoplasm capacitance of a biological cell,” IEEE MTT-S Int. Microwave Symp. (IMS), San Francisco, CA, May 2016, pp. 1–3.
81. **Hang Li**^P, Xiao Ma^D, Xiaotian Du^D, Xuanhong Cheng and James C. M. Hwang^{LF}, “High-frequency Continuous-wave Electroporation of Jurkat Human Lymphoma Cells,” IEEE MTT-S Int. Microwave Symp. (IMS), San Francisco, CA, May. 2016, pp. 1–4.
82. **Xiaotian Du**^D, Xiao Ma^D, Hang Li^P, Vahid Gholizadeh^D, Xi Luo^D, Xuanhong Cheng, and James C. M. Hwang^{LF}, “Preliminary results for broadband electrical detection of bacteria,” IEEE Lester Eastman Conf. High Performance Devices, Bethlehem, PA, Aug. 2016, pp. 1–3.
83. **Agnese Denzi**, Caterina Merla, M. Casciola, James C. M. Hwang^{LF}, Xuanhong Cheng, Francesca Apollonio and Micaela Liberti, “Microchambers for cell exposure: From the design to applications,” Int. Conf. IEEE Eng. Medicine Biology Soc. (EMBC), Orlando, FL, Aug. 2016, pp. 1-4.
84. **Zeng Xie**^P, Yifeng Qian^D, Yongkang Gao^D, Hang Li^P, Sushi Kumar^{LF}, Qiaoqiang Gan, Xuanhong Cheng, Filbert Bartoli, “On-chip detection of immune-cell secretion using a

- circular nanoplasmonic interferometer array,” *CLEO: Science and Innovations, Optical Society of America*, San Jose, CA, May 2017.
85. **Chunqiao Dong**^D, Wei Wei^D, Michael Morabito^D, Edd Webb^{LF}, Alp Oztekin^{LF}, Frank X. Zhang^{LF} and Xuanhong Cheng, “Modeling Shear Induced Von Willebrand Factor Binding to Collagen,” *American Physical Society Annual Meeting*, New Orleans, LA, Mar. 2017.
 86. **Thomas Reidy**^M, Zhibo Cao^M, Guanyang Xue^D, Danli Luo and Xuanhong Cheng, “Nanoparticles Enrichment in Microfluidic Thermal Gradient Device,” *Biomedical Engineering Society Meeting*, Phoenix AZ, Oct. 11, 2017
 87. **Yi Wang**^D, Keely Heintz, Kieren Connor^U and Xuanhong Cheng, “Sandwich PDMS Membrane Device for HIV Capture and Concentration Test,” *Biomedical Engineering Society Meeting*, Phoenix AZ, Oct. 11, 2017
 88. **Yi Wang**^D, Wei Zhang^D, Whitney Lai^M, Yan Xu^D, Xuanhong Cheng and X. Frank Zhang^{LF}, “Unfolding Behavior of Von Willebrand Factor (VWF) Multimer and Fragments,” *Biomedical Engineering Society Meeting*, Phoenix AZ, Oct. 11, 2017
 89. **Priyokti Rana**^D, Thomas Reidy^M and Xuanhong Cheng, “Characterization of the Clogging Effect in Polydimethylsiloxane (PDMS) through Thermal Aging,” *Biomedical Engineering Society Meeting*, Phoenix AZ, Oct. 11, 2017
 90. **Witney Lai**^M, Yi Wang^D, Xuanhong Cheng and Frank Zhang^{LF}, “Biomechanical Characterization of von Willebrand Factor and Its Mutant,” *Biomedical Engineering Society Meeting*, Phoenix AZ, Oct. 11, 2017
 91. **Nastaran Gholizadeh**, Xiao Ma^D, Hang Li^P, Xiaotian Du^D, Yaqing Ning^D, Vahid Gholizadeh^D, Xuanhong Cheng and James C.M. Hwang^{LF}, “Ultra-wideband electromagnetic detection of biological cells,” *IEEE Microwave Measurement Conference (ARFTG), 2017 89th ARFTG*, Jun. 9, 2017
 92. **Hang Li**^P, Xiao Ma^D, Xiaotian Du^D, Yaqing Ning^D, Xuanhong Cheng and James C. M. Hwang^{LF}, “Correlation between morphology change and microwave property during single-cell electroporation,” *IEEE Microwave Symposium (IMS), 2017 IEEE MTT-S International*, Jun. 9, 2017.
 93. **Xuanhong Cheng**, “Microfluidic Nanoparticle Concentrator Based on Helical Flow Coupled with a Temperature Gradient,” *19th Symposium on Field Flow Fractionation*, Columbia, May 14, 2018.
 94. Danli Luo, Guanyang Xue^D and **Xuanhong Cheng**, “Nanoparticle Focusing by Coupling Thermophoresis and Engineered Vortex in Microfluidic Device,” *Biomedical Engineering Society Meeting*, Atlanta GA, Oct. 18, 2018
 95. **Yi Wang**^D, Michael Morabito^D, Wenpeng Cao^D, Alparslan Oztekin^{LF}, Edmund Webb^{LF}, Frank Zhang^{LF} and Xuanhong Cheng, “Conformational Change of von Willebrand Factor (vWF) under Shear Flow in Microfluidic Devices,” *Biomedical Engineering Society Meeting*, Atlanta GA, Oct. 18, 2018.
 96. **Yi Wang**^D, Michael Morabito^D, Ciara Kavanagh, Avani Pisapati, Xiaohui F. Zhang^{LF}, Edmund Webb^{LF}, Alparslan Oztekin^{LF} and Xuanhong Cheng, “Shear-Induced Extensional Response Behaviors of Tethered von Willebrand Factor,” *Northeastern Biomedical Engineering Conference*, Rutgers University, NJ, Mar. 20, 2019.
 97. Yifeng Qian, Yu-Han Ho, Sushil Kumar, Xuanhong Cheng and Filbert Bartoli, “Nanoplasmonic Interferometric Sensor for Multiplex Detection of MMP-9 and TIMP-1,” *CLEO: Applications and Technology*, San Francisco, CA, May 5, 2019.

98. Yi Wang, Michael Morabito, Avani Pisapati, Ciara Kavanagh, Xiaohui F. Zhang, Edmund Webb III, Alparslan Oztekin, and Xuanhong Cheng, "Shear-Induced Extensional Behaviors of Tethered Von Willebrand Factor," *The Biomedical Engineering Society Meeting*, Philadelphia, PA, Oct. 18, 2019.
 99. Caroline A. Ladegard, Xuanhong Cheng, "Sheath Flow Focusing of Jurkat Cells for Electrical Impedance Probing," *The Biomedical Engineering Society Meeting*, Philadelphia, PA, Oct. 18, 2019.
 100. Ashleigh Crawford, Jannah Wing, Maria Lancia, Olivia O'Donnell, Paola Lopez, Jaro Perera, Nattapat Dream Intarachumnum, Xuanhong Cheng, "Low-Cost, Point-of-Care Sickle Cell Anemia Screening Device for Use in LMICs," *The Biomedical Engineering Society Meeting*, Philadelphia, PA, Oct. 19, 2019.
 101. Ashleigh Crawford and Xuanhong Cheng, "Thermophoretic Focusing for Improved Exosome Separation," *4th Bioengineering and Translational Medicine Conference*, Duke University, Durham, NC, Oct 7, 2019.
- ***Organized or Chaired Sessions/Colloquia/Exhibits/Performances/Conferences***
 - American Institute of Chemical Engineering Annual Meeting, Session Chair, November 14, 2008.
 - Materials Research Society Annual Meeting, Session Chair, April 14, 2009
 - American Institute of Chemical Engineering Annual Meeting, Session Chair, Nov. 11, 2009.
 - Biomedical Engineering Society Annual Fall Meeting, Session Chair, Oct. 9, 2010.
 - Canadian Congress of Applied Mechanics, Session Chair, Jun. 6, 2011.
 - Biomedical Engineering Society Annual Fall Meeting, Session Chair, Oct. 26, 2012.
 - Biomedical Engineering Society Annual Fall Meeting, Session Chair, Oct. 8, 2016.
 - 2nd International Conference of Microfluidics, Nanofluidics and Lab on a Chip, Session Chair, Jun. 10, 2018.
 - ***Other***
 - N/A

G. TEACHING AND RESEARCH ADVISING

- *Courses Taught*

Core Courses

MAT 33 Recitation, Engineering Materials and Processes, 3 credits,	
Taught 1 recitation a week (40 students)	Fall 2008
Taught 1 recitation a week (48 students)	Fall 2014
Taught 1 recitation a week (48 students)	Fall 2016
Taught 1 recitation a week (48 students)	Fall 2017
Taught 1 recitation a week (44 students)	Fall 2018
Bioen 210, Engineering Physiology, 4 credits	
Taught 3 lectures a week (24 students, L. Herz taught the labs)	Spring 2009
Taught 3 lectures a week (31 students, L. Herz taught the labs)	Spring 2010
MAT 302/252, Electronic Properties of Materials, 3 credits	
Sole instructor, 3 lectures a week (33 students)	Fall 2009
Sole instructor, 3 lectures a week (33 students)	Fall 2010
Sole instructor, 3 lectures a week (24 students)	Fall 2011
Sole instructor, 3 lectures a week (27 students)	Fall 2012
Sole instructor, 3 lectures a week (33 students)	Fall 2013
Sole instructor, 3 lectures a week (14 students)	Fall 2014
Sole instructor, 3 lectures a week (27 students)	Fall 2016
Co-taught w/ N. Strandwitz, 3 lectures a week for 7 weeks (28 students)	Fall 2017
Co-taught w/ N. Strandwitz, 3 lectures a week for 7 weeks (26 students)	Fall 2018
Bioen 296/247, Biological Transport Phenomena, 4 credits	
Sole instructor, 4 lectures a week (25 students)	Spring 2011
Sole instructor, 4 lectures a week (17 students)	Spring 2012
Sole instructor, 4 lectures a week (25 students)	Spring 2014
Sole instructor, 3 lectures and 3 labs a week (35 students)	Spring 2018

Elective Courses

Bioen 397/324/424, Introduction to Organic Biomaterials, 3 credits	
Sole instructor, 3 lectures a week (14 students)	Spring 2008
Sole instructor, 3 lectures a week (34 students)	Spring 2011
Sole instructor, 3 lectures a week (35 students)	Spring 2013
Sole instructor, 3 lectures a week (40 students)	Spring 2015
Sole instructor, 3 lectures a week (24 students)	Spring 2017
Sole instructor, 3 lectures a week (29 students)	Spring 2019
CINQ 397, Creative Inquiry Independent Project: 3 credits	
Advisor, 2 meeting hours a week (5 students)	Fall 2018
Advisor, 2 meeting hours a week (5 students)	Spring 2018

Guest Lectures/Presentations

BioS 10, Bioscience in the 21st Century, one lecture annually in Fall	
BioE 10, Introductory Seminar for Freshman, one lecture annually in Fall	

- **Advising—Research Direction**

- **Research of Undergraduate Students**

46 total

- **Master’s Students**

Zhibo Cao (Thesis-based MS)	Sep. 2015-Jun. 2017	ECE, Lehigh
Thomas Reidy (Thesis-based MS)	Sep. 2016-Dec. 2018	BioE, Lehigh

- **Doctoral Students**

Yi Hu (PhD, 2012)	Sep. 2009-Dec. 2012	Physics, Lehigh
Krissada Surawathanawises (PhD, 2015)	Sep. 2008-May 2015	MSE, Lehigh
Bu Wang (PhD, 2015)	Sep. 2008-Feb. 2015	MSE, Lehigh
Chao Zhao (PhD, 2015)	Sep. 2010-Aug. 2015	MSE, Lehigh
Yifeng Qian (PhD expected May 2020)	Sep. 2015-now	ECE, Lehigh
Xiaotian Du (PhD expected May 2021)	Sep. 2016-now	ECE, Lehigh
<i>Co-advised with Jim Hwang in ECE Department</i>		
Guanyang Xue (PhD expected Dec. 2020)	Sep. 2017-now	MECH, Lehigh
Yi Wang (PhD expected May 2021)	Sep. 2016-now	MSE, Lehigh
Caroline Ladegard (PhD expected May 2023)	Sep. 2018-now	BioE, Lehigh

- **Other Students and Scholars**

Jianmin Wang	Sep. 2009-Aug. 2010	Visiting scholar, China
Shu-han Wu	Feb. 2010-Sep. 2010	Visiting Scholar, Taiwan
Dayong Gu	Apr. 2011-Jun. 2011	Visiting scholar, China
Weidong Xie	Jun. 2013-Aug. 2013	Visiting scholar, China
Hang Li	Jun. 2015-Feb. 2018	Postdoc Associate
Chao Zhao	Dec. 2015-Aug. 2016	Postdoc Associate
Jianan He	Oct. 2016-Dec. 2016	Visiting scholar, China
Qiongyu Guo	Oct. 2016-Dec. 2017	Postdoc Associate
Nick Pini	Jun. 2019-Nov. 2019	Visiting Scholar, Italy

- **Academic Advising**

5 MSE undergraduates and 20 BioE undergraduates (Freshman advisor in Fall 2013 and 2017)

- **PhD Committee**

33 total

H. SERVICE (INCLUDE DATES AND INDICATION OF LEADERSHIP ROLES)

- *University*

- **Service to University**

Summer Charting Horizons and Opportunities in Careers in Engineering and Science (CHOICE) Camp, Lecturer, “Fruit Battery and Electron Microscope,” Lehigh University, Bethlehem, PA, Jul. 7, 2008.

Bioscience in the 21st Century Lecture Series, Guest Lecturer, Department of Biological Sciences, Lehigh University, Bethlehem, PA, once per year

Department of Biological Sciences Search Committee, Committee Member, December 2008-April 2009.

Lehigh University Advisory Board Meeting, Guest Speaker, “Diagnostic Microchips for Global Health Improvement”, Feb.5, 2009

Lehigh University Representative to Pennsylvania Biotech Innovation Corridor, 2010

Workshop with Kazan State Technological University, Russia, Guest Speaker, “Nanomaterials for Biological Sample Processing,” Lehigh University, Bethlehem, PA, Dec. 2, 2011

Pennsylvania Governor Summer School, Instructor, Jul. 15, 2014

Exchange faculty member to East China University of Science and Technology, Instructor for Micro- and Nanomaterials (24 Lectures), Jun. 1-20, 2014

Faculty representative to meet with Board of Trustees, Oct. 1, 2015

Exchange faculty member to East China University of Science and Technology, Instructor for Micro- and Nanomaterials (24 Lectures), Dec. 15-30, 2016

University Graduate Research Committee (GRC), 2017-now

Physics Department Graduate Program Review Committee, 2018

- **Service to College**

RECAS Advisory Board Meeting, Presenter, May 9, 2008.

Engineering Polymer Institute, Member (EPI)

Center for Advanced Materials and Nanotechnology, Member (CAMN)

Biotech Clustering Hiring Proposal, Core Faculty, 2011

Operations Committee of the Center for Nanophotonics and Nanoelectronics, Member, 2012

Space Renovation Committee of the Health Research Initiative Hub, Member, 2011-2012

Steering Committee for the Health Research Hub, Member, 2012-2014

Operations Committee of the Health Research Hub, Member, 2013-now

Dean’s Envision Team 3, Member, 2016-2017

Tenure Evaluation Committee in RECAS, member, 2017-now

Tenure Evaluation Committee in RECAS, Chair, 2019-now

Faculty Council for Institute of Functional Materials and Devices, member, 2018-now

- **Service to Interdisciplinary Programs**

- BioE001/002, Guest Lecturers, Lehigh University, Bethlehem, PA, once per year

- IDEAS III Class, Guest Lecturer, “Career Paths and Research Interest,” IDEAS Program, Lehigh University, Bethlehem, PA, Nov. 6, 2008.

- Bioengineering Core Faculty, Jan. 2008-now

- Bioengineering Curriculum Committee, Member, Jan. 2008-now

- Bioengineering Search Committee, Member, 2009, 2011, 2012, 2013

- Bioengineering Search Committee, Chair, 2014, 2016

- Bioengineering Graduate Admission Committee, Member, November 2008-now

- Bioengineering TA Assignment Committee, Member, Jan 2010-now

- Faculty Representative to the Bioengineering Team on Engineering Day, 2009-2013

- Integrated Product Design Faculty Sponsor, 2016

- Technical Entrepreneurship Week, advisor to student teams, 2016, 2017, 2018

- Bioengineering Department Chair Search Committee, Co-Chair, 2018

- College of Engineering Cyber Physical Sensors and Systems Search Committee, member, 2018

- **Service to Department**

- Graduate Curriculum Committee, member, Sep. 2016-now

- Undergraduate Curriculum Committee, Committee Member, Mar. 2008-Jul. 2016

- Candidates Day Open House Participant, Bioengineering and MSE, 2008-now

- Parents Day Open House Participant, Bioengineering and MSE, 2008-now

- Acting Chair of Bioengineering Department, Jan. 2019-June 2019

- Graduate Curriculum Committee, chair, Sep. 2019-now

- **Professional**

- **Office and Committee Memberships in Professional Organizations**

- Member of Biomedical Engineering Society (BMES)

- Member of American Chemical Society (ACS)

- Member of Society for Biomaterials (SFB)

- Member of American Vacuum Society (AVS)

- Member of American Institute of Chemical Engineering (AIChE)

○ **Other Non-University Committees, Commissions and Panels**

- The K12 Outreach Program, Lecturer, “Bioengineer for a Day: Build an Artificial Finger,” University of Washington Engineered Biomaterials, Seattle, WA, 2000-2004
- BioMEMS Resource Center Annual Workshop, Laboratory modulator, “Cell Capture in Biochips,” Boston, MA, 2007
- Biomedical Engineering Society Abstract Reviewer, 2009-now
- Massachusetts General Hospital: Career Development Panel, Panellist, “How to Land Your First Academic Job,” Boston, MA, Jun. 18, 2008.
- National Science Foundation Panel Review, Panelist, Dec. 1, 2008
- National Science Foundation Panel Review, Panelist, Nov 19-20, 2009
- National Institute of Health RC1 Mail Review, Reviewer, July, 2009
- American Chemical Society Petroleum Research Fund, Reviewer, Jan 25, 2010
- Pennsylvania Biotech Innovation Corridor Poster Session, Reviewer, Sep, 2010
- National Institute of Health R21 Review, Teleconference Reviewer, Dec 2-3, 2010
- Mail-in Reviewer, Faculty Recruiting Committee, Tsinghua University, Taiwan, Nov. 2012
- Mail-in Reviewer, Faculty Promotion Committee, Tsinghua University, Taiwan, Nov. 2014
- Mail-in Reviewer, UConn SPARK Technology Commercialization Fund Review, University of Connecticut, May 2017 & May 2018
- Mail-in Reviewer, UW-Milwaukee Research Growth Initiative, University of Wisconsin-Milwaukee, Jan. 2018
- National Institute of Health Panel Review, Panelist, Nov 13-14, 2014
- National Institute of Health Panel Review, Panelist, Mar 12, 2015
- National Institute of Health Panel Review, Panelist, Mar 17, 2015
- National Institute of Health Panel Review, Panelist, Nov. 11-12, 2015
- National Institute of Health Panel Review, Panelist, Jun. 30-Jun. 1, 2016
- National Institute of Health Panel Review, Panelist, Nov. 1-2, 2016
- National Institute of Health Panel Review, Panelist, Sep. 23, 2018
- Summer Biomechanics, Bioengineering and Biotransport Conference Abstract Reviewer, Jun. 29 –Jul. 2, National Harbor, MD, 2016
- Army Research Office, mail-in proposal reviewer July, 2015
- National Institute of Health Panel Review, Panelist, Oct. 18, 2016
- National Institute of Health Panel Review, Panelist, Dec. 1, 2016
- Army Research Office, mail-in proposal reviewer, Feb. 2017
- National Science Foundation, Panel Review, Panelist, Mar. 28, 2017
- National Institute of Health Panel Review, Panelist, Oct. 30, 2017
- National Institute of Health Panel Review, Panelist, Jan. 30, 2018
- National Institute of Health Panel Review, Panelist, May 30, 2019

- **International Activities**
 - Tenure package review, Tsing-Hua University, Taiwan, 2013
 - Invited lecturer to teach classes (16 hours) in Summer 2014, Eastern China University of Science and Technology, June 2014
 - Invited lecturer to teach on classes (24 hours) in Winter 2016, Eastern China University of Science and Technology, December, 2016
 - Guest Professorship at the Graduate College of Universita Degli Studi G. d'Annunzio, Chieti Pescara, Viale Pindaro, Italy, 2017-now

- **Service to Community/Public**
 - **Outreach Activities**
 - Panelist, Massachusetts General Hospital: Career Development Panel, “How to Land Your First Academic Job,” Boston, MA, Jun. 18, 2008.
 - Faculty Coordinator, NanoDays, Allentown, PA, 2010-now annually
 - Lab Tour Coordinator, Visitors from Local Middle and High School to Bioengineering, Lehigh University, 2012
 - Lecturer, K-12 Outreach Program, “Bioengineering and Biomaterials,” Allen High, Allentown, PA, 2011, 2012
 - **Other International Activities**
 - N/A
 - **Other**
 - Society for Biomaterials Annual Meeting, Abstract Reviewer, June 2006.
 - American Society of Mechanical Engineering Annual Meeting, Abstract Reviewer, April 2008.
 - American Institute of Chemical Engineers Annual Meeting, Abstract Reviewer, 2008, 2009, 2010.
 - Biomedical Engineering Society Annual Meeting, Abstract Reviewer, 2008, 2009, 2010, 2011, 2012, 2013, 2016, 2019.
 - Daktari Diagnostics Inc., Member, Scientific Advisory Board, 2010-2017
 - Fellowships from the American Association of University Women, Reviewer, 2016
 - NIH DEBUT Competition, Reviewer, 2015
 - Peer Reviewer for ACS Nano, Acta Biomaterialia, Analytica Chimica Acta, Analytical Chemistry, Analytical Methods, Biointerphases, Biomacromolecules, BioMed Central, Biomedical Materials, Biomedical Microdevices, Biomicrofluidics, Biosensors, Chemistry of Materials, Clinical Immunology, Journal of Biomedical Materials Research, Journal of Nanoparticle Research, Lab on a Chip, Langmuir, Materials, Micromachines, Microfluidics and Nanofluidics, Microsystem Technologies, Nanomaterials, Nanomedicine and Nanobiotechnology, Nanoscale Research Letters, Nature Microsystems and Nanoengineering, Plasma Processing and Polymers, PLOS ONE, Scientific Report, Surface and Interface, Tissue Engineering etc.

