Lance Cameron Kam

Professor of Biomedical Engineering and Professor of Medical Sciences (in Medicine)

A. FIELD OF SPECIALIZATION

Micro-/Nano-scale Engineering of Cell Function and Immune Engineering

Cells posess the remarakable ability to respond to a complex extracellular environment. My research and teaching programs focus on how cells recognize the spatial organization and mechanics of the extracellular environment, with a particular focus on how multiple signals are integrated to drive cell response. Our current projects are on cells of the adaptive immune system, which offer both a firm foundation in cellular physiology and immediate therapeutic potentials.

B. ACADEMIC TRAINING

December, 1999	Rensselaer Polytechnic Institute *Ph.D., Biomedical Engineering* *Dissertation title: "*Control over Neural Cell Function by Micropatterning" *Sponsor:* Rena Bizios, Ph.D.
May, 1994	University of Hawaii at Manoa, Honolulu, HI *M.S. Mechanical Engineering*
May, 1991	Washington University in St. Louis, St. Louis, MO *B.S. Mechanical Engineering & B.S. Physics*

C. EMPLOYMENT RECORD

2019	Professor of Medical Sciences (in Medicine), Columbia University, New York, NY (1/19-)
2018	Professor of Biomedical Engineering, Columbia University, New York, NY (7/18 -)
2012	Associate Professor of Biomedical Engineering, Columbia University, New York, NY (6/12-6/18)
2003	Assistant Professor of Biomedical Engineering, Columbia University, New York, NY (8/03-6/12)
1999	Postdoctoral Fellow, Chemistry, Stanford University, (6/99-6/03) *Mentor:* Steven G. Boxer, Ph.D.
1994	Graduate Research Assistant, Wadsworth Center, Albany, NY (8/94-5/99) *Mentors:* Rena Bizios, Ph.D.; William G. Shain, Ph.D.
1991	Graduate Research Assistant, University of Hawaii at Manoa, Honolulu, HI (8/91-5/94) *Mentor:* Michael J. Antal, Jr., Ph.D.

D. ACADEMIC AND PROFESSIONAL HONORS

Rising Star selection. BMES-SPRBM Conf. on Cellular and Molecular Bioengineering (2011).

Visiting Professor. College of Chemistry, Chemical Engineering, and Materials Science, Soochow University, Suzhou, China (2010).

Guest Editor. Special issue of *Cellular and Molecular Bioengineering* on "Cell mechanics and Signaling: From Micro to Nano", (2010).

Innovative Project Seed Funding. Columbia University – Research Initiatives for Science and Engineering (2008 – 2010). "Bioengineering Approaches to Study Neual Circuit Assembly".

Invited Discussion Leader / Coordinator. Gordon Research Conference on Biointerface Science (2008).

Innovative Project Seed Funding. Columbia University and the Gatsby Charitable Foundations – The Gatsby Initiative in Brain Circuitry (2005 – 2007). "Neuron Networks on Active Arrays".

Innovative Project Pilot Award. Stanford University – Bio-X Interdisciplinary Initiatives (2002 – 2003). Engineering Supported Lipid Bilayers for Study of Cell Signaling

Individual Postdoctoral Fellowship. Nationals Institutes of Health, National Institute of General Medical Scciences (2001). Supported Lipid Bilayers for Investigation of Cell-Cell Communication.

Postdoctoral Fellowship. Stanford University – National Institutes of Health Genome Training Program (2000). Hybrid DNA Systems in Studies of Supported Lipid Bilayer Dynamics

E. TEACHING AND RESEARCH TRAINING

E.1 Courses Taught

Spring 2019: BMEN E3998, Projects in Biomedical Engineering (instructor, enrollment = 2)
BMEN E9100, Masters Research (instructor, enrollment = 1)
BMEN E9500, Doctoral Research (instructor, enrollment = 3)

Fall 2018: BMEN E3998, Projects in Biomedical Engineering (instructor, enrollment = 1)
BMEN E4001, Quantitative Physiology I (instructor, enrollment = 81)
BMEN E4001, Quantitative Physiology I, CVN (instructor, enrollment = 3)
BMEN E4150, Cell as a Machine (co-instructor, enrollment = 19)
BMEN E9500, Doctoral Research (instructor, enrollment = 3)

Spring 2018: BMEN E3998, Projects in Biomedical Engineering (instructor, enrollment = 2)
BMEN E4550, Micro-/Nano-scale Structures in Cellular Engineering (instructor, enrollment = 23)
BMEN E9100, Masters Research (instructor, enrollment = 1)
BMEN E9500, Doctoral Research (instructor, enrollment = 1)

Fall 2017: BMEN E3998, Projects in Biomedical Engineering (instructor, enrollment = 3)
BMEN E4001, Quantitative Physiology I (instructor, enrollment = 76)
BMEN E4001, Quantitative Physiology I, CVN (instructor, enrollment = 3)
BMEN E4150, Cell as a Machine (co-instructor, enrollment = 11)
BMEN E9100, Masters Research (instructor, enrollment = 1)
BMEN E9500, Doctoral Research (instructor, enrollment = 3)

Spring 2017: BMEN E3998, Projects in Biomedical Engineering (instructor, enrollment = 3)
BMEN E4550, Micro-/Nano-scale Structures in Cellular Engineering (instructor, enrollment = 15)
BMEN E9100, Masters Research (instructor, enrollment = 1)
BMEN E9500, Doctoral Research (instructor, enrollment = 2)

Fall 2016: BMEN E3998, Projects in Biomedical Engineering (instructor, enrollment = 2)
BMEN E4001, Quantitative Physiology I (instructor, enrollment = 65)
BMEN E4001, Quantitative Physiology I, CVN (instructor, enrollment = 2)
BMEN E4150, Cell as a Machine (co-instructor, enrollment = 11)
BMEN E9100, Masters Research (instructor, enrollment = 2)
BMEN E9500, Doctoral Research (instructor, enrollment = 2)

Spring 2016: BMEN E3998, Projects in Biomedical Engineering (instructor, enrollment = 1)
BMEN E4550, Micro-/Nano-scale Structures in Cellular Engineering (instructor, enrollment = 4)
BMEN E9100, Masters Research (instructor, enrollment = 2)
BMEN E9500, Doctoral Research (instructor, enrollment = 1)

Fall 2015: BMEN E4001, Quantitative Physiology I (instructor, enrollment = 68)
BMEN E4001, Quantitative Physiology I, CVN (instructor, enrollment = 1)
BMEN E4150, Cell as a Machine (co-instructor, enrollment = 7)
BMEN E9100, Masters Research (instructor, enrollment = 1)
BMEN E9500, Doctoral Research (instructor, enrollment = 3)

Spring 2015: BMEN E9500, Doctoral Research (instructor, enrollment = 2)

Fall 2014: BMEN E4001, Quantitative Physiology I (instructor, enrollment = 76)
BMEN E4001, Quantitative Physiology I, CVN (instructor, enrollment = 2)
BMEN E4150, Cell as a Machine (co-instructor, enrollment = 6)
BMEN E9500, Doctoral Research (instructor, enrollment = 2)

Spring 2014: BMEN E3920, Biomedical Engineering Design II (group advisor)
BMEN E9500, Doctoral Research (instructor, enrollment = 3)

Fall 2013: BMEN E3910, Biomedical Engineering Design Lab I (group advisor)
BMEN E4001, Quantitative Physiology I (instructor, enrollment = 64)
BMEN E4001, Quantitative Physiology I, CVN (instructor, enrollment = 2)
BMEN E4150, Cell as a Machine (co-instructor, enrollment = 3)
BMEN E9500, Doctoral Research (instructor, enrollment = 4)

Spring 2013: BMEN E3920, Biomedical Engineering Design II (group advisor)
BMEN E4550, Micro-/Nano-scale Structures in Cellular Engineering (instructor, enrollment = 8)
BMEN E9100, Masters Research (instructor, enrollment = 1)
BMEN E9500, Doctoral Research (instructor, enrollment = 2)

Fall 2012: BMEN E4001, Quantitative Physiology I (instructor, enrollment = 77)
BMEN E4001, Quantitative Physiology I, CVN (instructor, enrollment = 3)
BMEN E3830, Biomedical Engineering Lab II (module instructor, enrollment = 25)
BMEN E3910, Biomedical Engineering Design Lab I (group advisor)
BMEN E9100, Masters Research (instructor, enrollment = 1)
BMEN E9500, Doctoral Research (instructor, enrollment = 3)

Spring 2012: BMEN E3920, Biomedical Engineering Design II (group advisor)
BMEN E4550, Micro-/Nano-scale Structures in Cellular Engineering (instructor, enrollment = 7)
BMEN E4502, Tissue engineering, II: biological tissue substitutes (module instructor, enrollment = 48)
BMEN E9500, Doctoral Research (instructor, enrollment = 1)

Fall 2011: BMEN E3910, Biomedical Engineering Design Lab I (group advisor)
BMEN E4001, Quantitative Physiology I (instructor, enrollment = 69)

BMEN E4001, Quantitative Physiology I, CVN (instructor, enrollment = 5)

BMEN E9100, Masters Research (instructor, enrollment = 1)
BMEN E9500, Doctoral Research (instructor, enrollment = 3)
BMEN E9700, Biomedical Engineering Seminar (instructor, enrollment = 33)

Spring 2011: BMEN E3920, Biomedical Engineering Design II (group advisor)
Team Uzima wins Rice Global Health Technology Competition
Tean Uzima winsNCIIA E-Team Grant
BMEN E9100, Masters Research (instructor, enrollment = 1)
BMEN E9500, Doctoral Research (instructor, enrollment = 1)
BMEN E9700, Biomedical Engineering Seminar (instructor, enrollment = 34)

Fall 2010: BMEN E3998, Projects in Biomedical Engineering (instructor, enrollment = 1)
BMEN E3910, Biomedical Engineering Design Lab I (group advisor)
BMEN E4001, Quantitative Physiology I (instructor, enrollment = 63)
BMEN E4001, Quantitative Physiology I, CVN (instructor, enrollment = 1)
BMEN E9100, Masters Research (instructor, enrollment = 2)
BMEN E9700, Biomedical Engineering Seminar (instructor, enrollment = 38)

Spring 2010: BMEN E3920, Biomedical Engineering Design Lab II (group advisor)
BMEN E9100, Masters Research (instructor, enrollment = 1)
BMEN E9700, Biomedical Engineering Seminar (instructor, enrollment = 40)

Fall 2009: BMEN E3910, Biomedical Engineering Design Lab I (group advisor)
BMEN E4550, Micro-/Nano-scale Structures in Cellular Engineering
(instructor, enrollment = 14)
BMEN E9100, Masters Research (instructor, enrollment = 1)
BMEN E9700, Biomedical Engineering Seminar (instructor, enrollment = 39)

Spring 2009: BMEN E3998, Projects in Biomedical Engineering (instructor, enrollment = 2)

Fall 2008: BMEN E3910, Biomedical Engineering Design I (group advisor, enrollment = 45)
BMEN E3998, Projects in Biomedical Engineering (instructor, enrollment = 3)
BMEN E4001, Quantitative Physiology I (instructor, enrollment = 66)
BMEN E4001, Quantitative Physiology I, CVN (instructor, enrollment = 5)
BMEN E6003, Comp Mod Physiol Sys (module instructor, enrollment = 16)

Spring 2008: BMEN E3920, Biomedical Engineering Design II (group advisor, enrollment = 53)
Team iQue wins second placein rerc on AMI National Student Design Competition.
BMEN E3998, Projects in Biomedical Engineering (instructor, enrollment = 1)
BMEN E6001, Advanced Quantitative Physiology I (instructor, enrollment = 31)
BMEN E6001, Advanced Quantitative Physiology I, CVN (instructor, enrollment = 1)

Fall 2007: BMEN E3910, Biomedical Engineering Design I (group advisor, enrollment = 45)
BMEN E4001, Quantitative Physiology I (instructor, enrollment = 83)
BMEN E4001, Quantitative Physiology I, CVN (instructor, enrollment = 3)
BMEN E9100, Masters Research (instructor, enrollment = 1)

Spring 2007: BMEN E3998, Projects in Biomedical Engineering (instructor, enrollment = 1)
BMEN E3830, Biomedical Engineering Lab III (1 module, enrollment = 53)
BMEN E3920, Biomedical Engineering Design II (group advisor, enrollment = 53)
BMEN E6001, Advanced Quantitative Physiology I (instructor, enrollment = 25)

Fall 2006: BMEN E3910, Biomedical Engineering Design I (group advisor, enrollment = 53)
BMEN E4001, Quantitative Physiology I (instructor, enrollment = 65)
BMEN E4001, Quantitative Physiology I, CVN (instructor, enrollment = 3)

Spring 2006: BMEN E3998, Projects in Biomedical Engineering (instructor, enrollment = 2)
BMEN E9500, Doctoral Research (instructor, enrollment = 3)

Fall 2005: BMEN E3820, Biomedical Engineering Lab II (1 module, enrollment = 70)
BMEN E3998, Projects in Biomedical Engineering (instructor, enrollment = 1)
BMEN E4001, Quantitative Physiology I (instructor, enrollment = 77)
BMEN E6001, Advanced Quantitative Physiology I (instructor, enrollment = 25)
BMEN E6001, Advanced Quantitative Physiology I, CVN (instructor, enrollment = 5)
BMEN E9500, Doctoral Research (instructor, enrollment = 3)

Spring 2005: BMEN E3998, Projects in Biomedical Engineering (instructor, enrollment = 2)
BMEN E4000, Microfabrication in Cellular Engineering (instructor, enrollment = 27)
BMEN E9100, Masters Research (instructor, enrollment = 2)
BMEN E9500, Doctoral Research (instructor, enrollment = 1)

Fall 2004: BMEN E4001, Quantitative Physiology I (instructor, enrollment = 98)
BMEN E6001, Advanced Quantitative Physiology I (instructor, enrollment = 41)
BMEN E9100, Masters Research (instructor, enrollment = 1)
BMEN E9500, Doctoral Research (instructor, enrollment = 2)

Spring 2004: BMEN E3820, Biomedical Engineering Lab II (1 module, enrollment = 59)
BMEN E3840, Biomedical Engineering Lab IV (instructor, enrollment = 18)
BMEN E3998, Projects in Biomedical Engineering (instructor, enrollment = 1)
BMEN E6002, Advanced Quantitative Physiology II (1 module, enrollment = 42)

E.2 Research Training and Mentoring

Postdoctoral Fellow Research Supervised (duration):present position

1. Parthiv Chaudhuri (2017-): *Postdoctoral Researcher, Columbia University*
2. Joung-Hyun Lee (2011-): *Associate Research Scientist, Columbia University*
3. Debjit Dutta (2011-2013): *Postdoctoral Fellow, Genome Institute of Singapore*
4. Erdem Tabdanov (2010-2013): *R&D Researcher, University of Minnesota*
5. Keyue Shen, Ph.D., (2009-2010): *Assistant Professor, University of Southern California.*
6. Alexander Gondarenko, Ph.D., (2009-): *Postdoctoral Fellow, Columbia University*
7. Changgu Lee, Ph.D., (2005-06): *Assistant Professor, Sungkyunkwan University*
8. Oksana Cherniavskaya, Ph.D. (2004-2006): *Strategist, Goldman Sacks*

Doctoral Student Research Supervised (duration): most recent position

1. Michael Sutton (2018-), *PhD program, Columbia University*
2. Lingting Shi (2017-): *PhD program, Columbia University*
3. Chirag Sachar (2016-): *PhD program, Columbia University*
4. Haeun Lee (2015-): *PhD program, Columbia University*
5. Dennis Yuan (2015-): *PhD program, Columbia University*
6. Alex Dang (2013-18): *Co-Founder, JURA*
7. Weiyang Jin (2012-18): *Senior Associate, The Boston Consulting Group*
8. Sarah DeLeo (2012-14): *Specialist, Insight Technology Solutions*
9. Haoqian Chen (2010-15): *Associate Research Program Manager, Rutgers Center for Pharmacoepidemiology and Treatment Science*
10. Keenan Bashour, M.S. (2009-13): *Research Scientist, Juno Therapeutics*
11. Edward Judokusumo (2009-14): *not known*
12. Keyue Shen, M.S. (2004-09): *Assistant Professor, University of Southern California.*
13. Peng Shi, M.S. (2004-09): *Associate Professor of Mechanical and Biomedical Engineering, City University of Hong Kong.*
14. Jones Tsai, M.S. (2004-10): *Professor, Golden West College.*

M.S. Student Research Supervised (duration): most recent position

1. Shuai Shao (2019-): *MS program, Columbia University*
2. Alex Choy (2016-17): *MS program, Columbia University*
3. Michael Ichikawa (2004-05): *not known*
4. Juliette Provenzano (2004-05): *medical student, Albert Einstein College of Medicine*
5. Jones Tsai, M.S. (2003-04): *Defended Ph.D. Dissertation, Columbia University*

B.S. Student Research Supervised (duration): most recent position

1. Michelle Kim (2019-): *undergraduate student, Columbia University*
2. Jacy Fang (2018): *undergraduate student, Columbia University*
3. Christina Li (2016-17): *undergraduate student, Columbia University*
4. Tony Nguyen (2016-): *undergraduate student, Columbia University*
5. Neha Nataraj (2014-17): *undergraduate student, Columbia University*
6. Lara Warner (2014-15): *undergraduate student, Columbia University*
7. Srinjoy Sil (2012-14): *undegraduate student, Columbia University*
8. Jessica Lau (2012): *undergraduate student, Clemson University*
9. Miriam Akejolu (2011-12): *graduate student, Columbia University*
10. Amy Huang (2011-12): *undergraduate, Columibia University*
11. Benjamin Aguilar (2011-12): *undergraduate, Columiba University*
12. Marissa Dreyer (2010-11): *undergraduate, Columbia University*
13. Brian Ji (2010): *MD/PhD program, Columbia University*
14. Roisin O'Toole (2010-12): *undergraduate, Columbia University*
15. Jennifer Lai (2009): *undergraduate, Massachusetts Institute of Technology, Recipient Rhodes Scholarship.*
16. Amanda Urick (2008-10): *Graduate student,Medical College of Wisconsin*
17. Julie Taylor (2008): *not known*
18. Lauren La Mura (2008): *not known*
19. Kavita Vani (2008): *not known*
20. Jie Qi (2008): *Ph.D. Candidate, Massachusetts Institute of Technology*
21. Jacob Abujaber (2007-08, City College of New York): *not known*
22. Eileen Sun (2006-08): *Ph.D. Candidate, Harvard University, Recipient NSF Graduate Research Fellowship*
23. Kartik Kesavabhotla (2005-06): *National Institutes of Health*
24. Yuan Gao (2005-07): *Ph.D. Candidate, Stanford University, Recipient NSF Graduate Research Fellowship*
25. Lalit Patel (2006-07): *Prostate Cancer Foundation, Santa Monica, CA*
26. Jalal Ahmed (2005-06): *not known*
27. Uche Kanu (2004-05): *Ph.D. Candidate, Cornell University*

E.3 Doctoral Thesis Committees

Doctoral Candidates Sponsored

1. Alex Dang (2013-18), "Electrospun antibody-functionalized poly(dimethyl siloxane)-based meshes for T cell adoptive immunotherapy"
2. Weiyang Jin (2012-18): "Multidimensional T Cell Mechanosensing"
3. Haoqian Chen (2010-15), "Spatial Organization of CD28 Modulates T-cell Activation"
4. Sarah DeLeo (2012-14), "Human T Cell Response to Substrate Rigidity for Design of Improved Expansion Platform"
5. Edward Judokusumo (2009-2014), "Mechanosensing in T cells"
6. Keenan Tali Bashour (2009-2013), "Spatial Dynamics and the Mechanoresponse in CD4+ T Cell Activation"
7. Keyue Shen (2004-2009, *With Distinction*), "Spatial Organization and Force Generation in the Immunological Synapse"

8. Peng Shi (2004-2009), “Multicomponent Interfaces Modulate Neural Development *In Vitro*”:
9. Jones Tsai (2004-2010), “Probing Cell Signaling Crosstalk Through Micro- and Nano-Surface Enigneering”

Doctoral Candidates Sponsored by Other Faculty Members

1. Megan Armstrong (Biomedical Engineering, 2018), “Single molecule imaging to characterize protein interactions with the environment”.
2. Siddharth Shekar (Electrical Engineering, 2018), “Design of custom CMOS amplifiers for nanoscale bio-interfaces”.
3. Mayur Saxena (Biomedical Engineering, 2018), “Mechanisms of Focal Adhesions” (Examiner).
4. Danielle R. Bogdanowicz (Biomedical Engineering, 2017), “Designing the Stem Cell Microenvironment for Guided Connective Tissue Regeneration” (Examiner).
5. Genevieve N. Brown (Biomedical Engineering, 2016), “The Sustainment and Consequences of Cytosolic Calcium Signals in Osteocytes” (Examiner).
6. Amy T.-C. Lam (Biomedical Engineering, 2015), “Assembly in Dynamic Nanoscale Systems” (Examiner).
7. Christopher D. Hue (Biomedical Engineering, 2015), “Blood-Brain Barrier Dysfunction and Repair After Blast-Induced Traumatic Brain Injury” (Examiner).
8. Jared M. Roseman (Electrical Engineering, 2015), “Hybrid Biological-Solid-State Systems: Powering an Integrated Circuit from ATP” (Examiner).
9. Kristen L. Lee (Biomedical Engineering, 2014), “A Mechanism of Mechanotransduction Mediated by the Primary Cilium” (Examiner).
10. Antonio Albanese (Biomedical Engineering, 2014), “Physiology-based Mathematical Models for the Intensive Care Unit: Application to Mechanical Ventilation” (Examiner).
11. Ofer Idan (Biomedical Engineering, 2014), “Modeling Nanoscale Transport Systems” (Examiner).
12. Antonio Albanese (Biomedical Engineering, 2014), “Physiology-based Mathematical Models for the Intensive Care Unit: Application to Mechanical Ventilation” (Examiner).
13. Kevin Dooley (Chemical Engineering, 2014), “Engineering a Repeats-in-Toxin Sca old for Stimulus-Responsive Biotechnology Applications” (Examiner).
14. Michael Robert Lamprecht (Biomedical Engineering, 2014), “A Potential Combination Therapy for Traumatic Brain Injury: 17β-estradiol and memantine” (Examiner).
15. Emmanuel Dumont (Biomedical Engineering, 2013), "Proteins at interfaces: Conformational behavior and wear" (Examiner).
16. Hesam Parsa (Biomedical Engineering, 2013), “Leveraging Microtechnology to Study Multicellular Microvascular Systems and Macromolecular Interaction” (Examiner).
17. Lauren Grosberg (Biomedical Engineering, TBD), “Development and applications of high speed and hyperspectral nonlinear microscopy” (Examiner).
18. Oren Shur (Chemical Engineering, 2012), “Engineering the Repeats-in-Toxin Domain for Biotechnology Applications” (Examiner).
19. Bhrani Shah (Biomedical Engineering, 2012), “Pyrintegrin Induced Adipogenesis: Biology, Bioengineering and Therapeutics” (Examiner).
20. Avital Mendelson (Biomedical Engineering, 2012), “Chondrogenesis of Stem/Progenitor Cells by Chemotaxis Using Novel Cell Homing Systems” (Examiner)
21. Anurag Mathur (Mechanical Engineering, 2011), “Engineering Substrate Curvature for Cellular Mechanotransduction and A Novel Method to Measure Protrusive Forces in Cells” (Examiner).
22. Na Lei (Electrical Engineering, 2011), “Microsystem Based on CMOS Multielectrode Array for Extracellular Neural Stimulation and Recording” (Examiner).
23. Ashok Chandler (Biological Sciences, 2011), “Integrin-Linked Kinase, ECM Compostion and Substrate Rigidity Regulate Focal Adhesion – Actin Coupling, Modulating Survival, Proliferation and Migration: Towards a Biophysical Cancer Biomarker” (Examiner).
24. Curtis Chin (Biomedical Engineering, 2010), “Engineering Microdevices for Global Health Diagnostics” (Examiner).

25. Melissa Simon (Biomedical Engineering, 2010), "Evaluation and Development of Cell-penetrating Peptides for Brain Cell Delivery" (Examiner).
26. Yuk Kee Cheung (Biomedical Engineering, 2010), "Fabrication of Multi-Component Hydrogel Microstructures and Microdevices" (Examiner).
27. Padmini Rangamani (Pharmacology and Systems Therapeutics, Mount Sinai School of Medicine, 2010) "Interdependence Between Cell Shape and Signaling: A Computational Study" (Examiner).
28. Edgar E. Nanne. (Chemical Engineering, 2010), "Augmentation of Diffusion Coefficients os Solutes in Flowing Erythrocyte Suspensions" (Examiner)
29. Nina Tandon (Biomedical Engineering, 2009) "Electrical Stimulation for Cardiac Tissue Engineering" (Examiner)
30. Shan Gao, Ph.D. (Chemical Engineering, 2009), "Characterization of the TAT Cell Penetrating Peptide and Directed Evolution of New Cell Penetrating Peptides for Protein and Nucleotide Delivery to Neuronal-like Cells" (Examiner)
31. Zhe Yu, Ph.D. (Biomedical Engineering, 2009), "Experimental Mild TBI Causes Functional Alterations of the Developing Hippocampus & Development of Electrophysiology Research Platforms" (Chair)
32. I-Ning Wang, Ph.D. (Biomedical Engineering, 2008), "Role of Heterotypica Cellular Interactions in the Regeneration of the Anterior Cruciate Ligament-to-Bone Interface" (Examiner)
33. David Schwartz, Ph.D. (Electrical Engineering, 2008), "A CMOS Single-photon Avalanche Diode Array for Fluorescence Lifetime Imaging and Microscopy Applications" (Examiner)
34. Ana Kostic, Ph.D. (Biological Sciences, 2007), "Matrix Rigidity Sensing and Response: Comparative Studies in Fibroblasts and Neurons" (Examiner)
35. Kim T. Nguyen, Ph.D. (Chemistry, 2005), "Second Harmonic Generation Studies of Molecular Motions at Membrane Mimetic Interfaces" (Examiner)

F. PUBLICATIONS

* Denotes students both sponsored and/or mentored by Professor Lance C. Kam

F.1 Peer-Reviewed Full Length Original Research Publications (48)

1. Tamzalit, F., Wang, M.S., Jin*, W., Tello-Lafoz, M., Boyko, V., Heddleston, J.M., Black, C.T., Kam, L.C., and Huse, M., "Interfacial actin protrusions mechanically enhance killing by cytotoxic T cells., *Science Immunology*, **4**:eaav5445 (2019).
2. Nataraj*, N.M., Dang*, A.P., Kam, L.C., and Lee, J.H., "Ex vivo induction of regulatory T cells from conventional CD4+ T cells is sensitive to substrate rigidity.", *Journal Biomedical Materials Research A*, **106**:3001-8 (2018).
3. Dang*, A.P., De Leo*, S., Bogdanowicz, D.R., Yuan*, D.J., Fernandes, S.M., Brown, J.R., Lu, H.H., and Kam, L.C., "Enhanced Activation and Expansion of T Cells Using Mechanically Soft Elastomer Fibers", *Advanced Biosystems*, **2**:1700167 (2018).
4. Morrell, A.E., Brown, G.N., Robinson, S.T., Sattler, R.L., Baik, A.D., Zhen, G., Cao, X., Bonewald, L.F., Jin*, Weiyang, Kam, L.C., and Guo, X.E. "Mechanically induced Ca2+ oscillations in osteocytes release extracellular vesicles and enhance bone formation", *Bone Research*, **6**:6 (2018).
5. Mayya, V., Judokusumo*, E., Abu Shah, E., Peel, C.G., Neiswanger, W., Depoli, D., Blair, D.A., Wiggins, C.H., Kam, L.C., and Dustin, M.L., "Durable Interactions of T Cells with T Cell Receptor Stimuli in the Absence of a Stable Immunological Synapse", *Cell Reports*, **22**:340-349 (2018).
6. Lambert*, L.H., Goebrecht*, G.K.E., De Leo*, S.E., O'Connor, R.S., Nunez-Cruz, S., Li, T.-D., Yuan*, J., Milone, M.C., and Kam, L.C., "Improving T Cell Expansion with a Soft Touch", *Nano Letters*, **17**: 821-6 (2017).
7. Hu, J., Gondarenko, A.A., Dang*, A.P., Bashour*, K.T., O'Connor, R.S., Lee, S., Liapis, A., Ghassemi, S., Milone, M.C., Sheetz, M.P., Dustin, M.L., Kam, L.C., and Hone, J.C., "High-

throughput mechanobiology screening platform using micro- and nanotopography", *Nano Letters*, **16**: 2198-204 (2016).

8. Basu, R., Whitlick, B.M., Husson, J., Le Floc'h, A.L., Jin*, W., Oyler-Yanic, A., Dotiwala, F., Giannone, G., Hivroz, C., Biais, N., Lieberman, J., Kam, L.C., and Huse., M., "Cytotoxic T cells use mechanical force to potentiate target cell killing", *Cell*, **165**:100-10 (2016).
9. Lee*, J.H., Dustin, M.L., and Kam, L.C., "A microfluidic platform reveals differential response of regulatory T cells to micropatterned costimulation arrays", *Integrative Biology*, **7**:1442-53 (2015).
10. Tabdanov*, E., Gondarenko, S., Kumari, S., Liapis, A., Dustin, M.L., Sheetz, M.P., Kam, L.C., Iskratch, T., "Micropatterning of TCR and LFA-1 ligands reveals complementary effects on cytoskeleton mechanics in T cells", *Integrative Biology*, **7**:1272-84 (2015).
11. Kumari, S., Depoil, D., Martinelli, R., Judokusumo, E.*, Carmona, G., Gertler, F.B., Kam, L.C., Carman, C.V., Burkhardt, J.K., Irvine, D.J., and Dustin, M.L., "Actin foci facilitate activation of the phospholipase C-γ in primary T lymphocytes via the WASP pathway", *eLife*, **4**:e04953 (2015).
12. Choudhuri, K., Llodra, J. Roth, E.W., Tsai, J.*, Gordo, S., Wucherpfennig, K.W., Kam, L.C., Stokes, D.L., and Dustin, M.L., "Polarized release of T-cell-receptor-enriched microvesicles at the immunological synapse", *Nature*, **507**: 118-23 (2014).
13. Bashour, K.T.*, Tsai, J.*, Shen, K.*, Lee, J.H.*, Sun, E.*, Milone, M.C., Dustin, M.L., and Kam L.C., "Crosstalk between CD3 and CD28 is spatially modulated by protein lateral mobility.", *Molecular and Cellular Biology*, **34**:955-64 (2013).
14. Bashour, K.T.*, Gondarenko, A.*, Chen, H.*, Shen, K.*, Liu, X., Huse, M., Hone, J.C., and Kam, L.C., "CD28 and CD3 have complementary roles in T-cell traction forces", *Proceedings of the National Academy of Sciences, USA*, **111**: 2241-6 (2014).
15. Wang, Y., Xu, Z., Kam, L.C., and Shi, P.*, "Site-specific differentiation of neural stem cell regulated by micropatterned multicomponent interfaces", *Advanced Healthcare Materials*, **3**:214-20 (2014).
16. O'Connor R.S., Hao, X., Shen, K.*, Bashour, K.*, Akimova, T., Hancock, W.W., Kam, L.C., Milone, M.C., "Substrate rigidity regulates human T cell activation and proliferation.", *Journal of Immunology*, **189**:1330-9 (2012).
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F.6 Refereed Proceedings and Transactions of National and International Meetings (93)

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85. Kam, L., Banker , G., Turner , J.N. Shain, W.G., and Bizios, R., "Neuronal and Astroglial Function on Micro-patterned Surfaces," Annual Meeting of the American Institute of Chemical Engineers, Miami, FL (1998).

86. Kam, L., Davis, R.C., James, C., Withers, G., Craighead, H.G., Issacson, M., Banker, G., Turner, J.N., and Shain, W., "Axonal Guidance on Micro-scale Protein Patterns", *Society for Neuroscience Abstracts,* **24**:289. 28th Annual Meeting of the Society for Neuroscience, Los Angeles, CA (1998).

87. Kam, L., Turner, J.N., Shain, W., Bizios, R., "Astroglial Function on Spatially Patterned Substrates," *Transactions of the Society for Biomaterials*, **21**:41 24th Annual Meeting of the Society for Biomaterials, San Diego, CA. (1998).

88. Kam, L., Turner, J.N., Shain, W., Bizios, R., "Astroglial Function on Spatially-patterned Substrates," *Proceedings of the 10th International Conference on Mechanics in Medicine and Biology*, J.A. Ashton-Miller (ed), Pacific Centre of Thermal-Fluids Engineering (PCTFE), p.307-308 (1998). 10th International Conference on Mechanics in Medicine and Biology, Honolulu, HI. (1998).

89. Kam, L., Turner, J.N., Shain, W., Bizios, R., "Astroglial Function on Spatially Patterned Substrates," *Transactions of the Society for Biomaterials*, **21**: 41. 24th Annual Meeting of the Society for Biomaterials, San Diego, CA. (1998).

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91. Kam, L., St. John, P.M., Craighead, H.G., Isaacson, M., Turner, J.N., Shain, W., & Bizios, R., "Astrocyte Adhesion to Peptide-Modified Substrates." Spring National Meeting of the American Chemical Society, San Francisco, CA. (1997).
92. Kam, L., Gu, X., Bizios, R., Turner, J.N., Shain, W., "Astroglial Cell Responses to Extracellular Matrix Proteins, Growth Factors, and Immobilized Peptides," *Society for Neuroscience Abstracts,* **23**:68. 27th Annual Meeting of the Society for Neuroscience, New Orleans, LA. (1997).
93. Kam, L., Bizios, R., Shain, W., Turner, J.N., "Selective Attachment of Astrocytes to Various Basement Membrane and Extracellular Matrix Proteins," *Society for Neuroscience Abstracts,* **22**:584. 26th Annual Meeting of the Society for Neuroscience, Washington D.C. (1996).

* Denotes students both sponsored and mentored by Professor Lance C. Kam
+ Denotes students co-mentored by Professor Lance C. Kam

G. PATENTS (13)

1. Shi, L., and Kam, L.C., "A method for inducing Regulatory T cells with TGF-b and IL-2 on Polyacrylmide gel coated with anti-CD3 and anti-CD28", provisional (2019).
2. Law, B.K.J., Low, H.Y., Suryana, M., Wee. K.F., Sheetz, M.P., Yim, K.F.E., Ng, Z.J., Teo, K.K., and Kam, L.C., "Process for making an array", US Patent Application US20180017551A1 (2018).
3. Kam, L.C., Lu, H.L., De Leo, S.E., Bashour, K.T., Bogdanowicz, D., Chuang, P., "Methods, Compositions, and Systems for Activation and Expansion of Cells", Pending, US Patent application 15/302,475(2017).
4. Kam, L.C., Dustin, M.L., and Yeager, K.E., "A cell loading well for microscopy of rare cells", Provisional (2012).
5. Hickey, G., and Kam, L.C., "Enhanced expansion of T cells by pharmacological inhibition of cell contractility", Provisional (2012).
6. Hickey, G., and Kam, L.C., "Bead-based format for rigidity-dependent control over ex vivo expansion of cells", Provisional (2012).
7. Milone, M.C., Kam, L.C., Shen, K., Hao, X., and O'Conner, R., "Activation and Expansion of T Cell Subsets Using Biocompatible Solid Substrates with Tunable Rigidity", Pending, US Patent Application14/342599 (2011).
8. Kam, L., "Image-side Optical Sectioning in Microscopy", Provisional (2011).
9. Milone, M.C, Shen, K., and Kam, L.C., "Ex vivo activation and expansion of human T cell subsets using biocompatible solid substrates with tunable rigidity", Provisional (2011).
10. Kam, L., Shen, K., Dustin, M.L., Thomas, V.K., "Micropatterned T cell stimulation", US Patent application 20080317724 (2008).
11. Ishii, C., Boxer, S.G., and Kam, L., "Spatially encoded and mobile arrays of tethered lipids", Pending, US Patent application 20040121377 (2004).
12. Boxer, S.G., and Kam, L., "Method for generating pure populations of mobile mebrane-associated biomolecules on supported lipid bilayers", US Patent application 20040018601 (2004).
13. Boxer, S.G., and Kam, L., "Biosensor arrays and methods", US Patent No. 6,503,452 (2000).

H. HONORS/AWARDS WON BY KAM RESEARCH GROUP INVESTIGATORS

2019 Graduate Research Fellowship Award, NSF Graduate Research Fellowship Program, *Lingting Shi*
2018 TL1, Irving Institute for Clinical and Translational Research, *Dennis Yuan*
2015 Graduate Research Fellowship Award, NSF Graduate Research Fellowship Program, *Alex Dang*
2011 Postdoctoral Research Fellowship, The Jane Coffin Child Memorial Fund, *Keyue Shen*
2011 Graduate Research Fellowship Award, NSF Graduate Research Fellowship Program, *Haoqian Chen*

2011 Goldwater Scholarship, *Brian Ji*
2010 Rhodes Scholarship, *Jennifer Lai*
2010 Graduate Research Fellow, NSF-sponsored BioIGERT program at Columbia University, *Haoqian Chen*
2009 Outstanding Paper from the 2009 Biomedical Engineering Society (BMES) Annual Meeting, *Peng Shi*
2009 Dissertation awarded with Distinction, Columbia University. This honor is awarded to no more than the top 10% of dissertations, *Keyue Shen*
2009 Graduate Research Fellow, NSF-sponsored BioIGERT program at Columbia University; *Keenan Bashour*
2008 National Science Foundation Graduate Research Fellowship; *Eileen Sun (earned as undergraduate senior, currently at Harvard University)*
2007 National Science Foundation Graduate Research Fellowship; *Yuan Gao (co-advised with Jim Hone; Fellowship earned as an undergraduate senion, now in graduate studies at Stanford University)*

Amgen Undergrduate Research Fellow (Mentor: LC Kam):
Eileen Sun (2007), Jennifer Lai (2009)
Summer Undergraduate Reseaerch Fellowship, Columbia University (Mentor: LC Kam)
Eileen Sun (2006), Kavita Vani (2008), Jie Qi (2008), AmandaUrick (2009)

I. RESEARCH GRANT ACTIVITY

I.I Completed Projects

Principal Investigator: Wallace Coulter Foundation, Columbia-Coulter Translational Research Partnership
Total Cost $112,051 8/1/14-6/30/16
"Immunomesh: a Platform for Improving Immunotherapy"
This pilot project seeks an alternative to bead-based T cell activation for adoptive immunotherapy.

Principal Investigator: Irving Institute, Columbia University
Total Cost $90,000 10/1/14-6/30/16
"Engineering Immunity through Biomaterials"
This pilot project seeks to determine whether micropatterned costimulation can be used to promote differentiation of regulatory T cells.

Principal Investigator: National Institutes of Health (NIAID, R01AI088377)
Total Cost $1,351,843 5/1/10-4/30/16
"Spatial Coordination of CD28 and TCR Signaling"
This project seeks to understand the role of membrane and cytoskeletal interactions on the ability of T cells to recognize the microscale geometry of the immune synapse, as well as the impact that this organization has on directing differentiation of naïve T cells.

Senior Scientist & Executive Board (PI: M.L. Dustin)**:** NIH (NEI, PN2EY016586)
Total Cost $20M 9/30/05-9/29/10 (phase I); 9/30/10-6/30/15 (phase II)
To-date award to L Kam: $2.4M; Beginning 8/1/2012, L Kam is PI of Columbia subcontract.
"Nanomedicine Center for Mechanobiology Directing the Immune Response"
This center aims to identify the mechanical aspects of the extracellular environment that drive stem cell function. An important element of this center is the migration of the micropatterned T cell costimulation concepts to expansion of human T cells.

Co-Investigator (PI: M.L. Dustin)**:** National Institutes of Health (NIAID, R01AI55037)
Total Cost $125,000 12/01/2009-11/30/2014
"Environmental Control of the Immunological Synapse"

This project seeks to understand the mechanisms by which T cells recognize the microscale organization of the immune synapse.

Co-Investigator (PI: K Shepard)**:** National Science Foundation (award 0801530)
Total Costs $3M 7/13/08-7/12/13
"IGERT: Optical Techniques for Actuation, Sensing, and Imaging of Biological Systems (OTASI)"
This project provides fellowship support and training to Ph.D. students involved in interdisciplinary research in bioimaging.

Co-Investigator (PI: G Vunjak-Novakovic): National Institutes of Health
12/1/08-11/30/13
"Tissue Engineering Resource Center""
This project seeks to develop core research resources for tissue engineering projects

Principal Investigator: National Institutes of Health (NIAID, F32AI00496)
Total Cost $106,132 12/01/12 – 11/30/14
"Microfluidic devices for investigation of rare T cell populations"
This project seeks a new platform for capturing and imaging rare populations of T cells. The technology is based on a magnetic retention system, and will be applied to RA cells.

Principal Investigator: National Institutes of Health (NIGMS, F32GM20878)
Total Cost $66,200, 5/1/01-12/31/02
"Cell Adhesion on Protein-micropatterned Lipid Bilayers""
This project seeks to develop micropatterned supported lipid bilayers as a biomimetic interface between engineered surfaces and living cells.

Principal Investigator: Columbia University, Gatsby Initiative in Brain Circuitry
Total Cost $50,000, 2/15/06-2/14/08
"Neuron Networks on Active Arrays"
This project seeks to adapt active CMOS arrays for use in recording and stimulating electrical activity from living neurons.

Principal Investigator: National Institutes of Health (NINDS, R21NS050302)
Total Cost $560,801, 7/1/05-6/30/08
"Neuronal Biointerface: Micropatterned Lipid Bilayers"
The goals of this project are to explore the use of Neuroligin-1, tethered to supported lipid bilayers, to promote assembly of pre-synaptic complexes in vitro.

Principal Investigator: National Institutes of Health (S10RR028089, NCRR)
Total Cost $178,000 4/1/10-3/31/11
"Direct Write Microfabrication Platform for Biomedical Research"
This project seeks to acquire a platform to carry out high-throughput patterning of substrates for microfluidics and protein patterning.

Co-Investigator (PI: G Vunjak-Novakovic): New York State Department of Health
Total/Direct Costs $1,250,000, 2/1/08-1/31/09
This project builds core infrastructure for stem cell-based tissues engineering research.

Principal Investigator: Columbia University, Research Initiative in Science and Engineering
Co-Investigators: Hynek Wichterle, Ph.D. (Columbia University) and Lawrence Shapiro, Ph.D. (Columbia University)
Total Cost $200,000, 5/15/08 – 5/14/10
"Bioengineering approaches to study neural circuity assembly"
This project seeks to apply advanced microfluidics devices to understanding how motor neurons recognize and respond to complex patterns of proteins in the extracellular anvironment.

Principal Investigator: National Institutes of Health (NIBIB, R21EB008199)
Total Cost $425,640 9/1/07-8/31/11
"Modulation of T Cell Function by Patterning of Costimulatory Ligands"
This project seeks to understand the mechanisms by which T cells recognize the microscale organization of the immune synapse.

I.I Active Projects

Principal Investigator: National Institutes of Health (NIAID, R01AI110593)
PI: L Kam, Co-I: H Lu
Total Cost $1,600,000 12/1/14-11/30/19
"Advanced Rigidity-based Material for Enhanced Immunotherapy"
New technologies for controlling the expansion of T cells have great potential for advancing adoptive immunotherapy. This project develops a fiber-based polymer system to stimulate T cells, leveraging the enhanced activation and expansion observed on materials of lower rigidity.

Principal Investigator: National Institutes of Health (NIAID, U24AI118669)
PI: L Kam, Co-I S Sia
Total Cost $1,228,536 6/18/15-5/31/19
"Sample Sparing Chambers for Imaging of T cell Response and Function"
This project seeks to develop and deploy microscopy chambers that provide high-efficiency imaging of rare T cell populations.

Principal Investigator: National Institutes of Health (NIAID, R21AI119953)
Total Cost $426,561 3/15/16-2/28/20
"Controllable Rigidity Surfaces for T Cell Mechanobiology"
This project seeks to develop a surface to T cell mechanobiology that presents a rigidity that can be controlled using a magnetic field.

Principal Investigator: National Science Foundation (1562905)
Co-PI's: M Huse and L Kam
Total Cost $148,219 9/1/16-8/31/19
"Mechanopotentiation of Cytotoxic T Cell Function"
This project seeks to unveil the role of mechanical forces in CD8+ T cell killing of APC. Specific goals include characterization of forces exerted by these cells and their underlying molecular mechanisms.

Principal Investigator: National Science Foundation (1743420)
Total Cost $678,129 9/1/17-8/31/20
"Predictive Optimization of T Cell Expansion"
This project seeks to identify proteomic and genetic biomarkers that will predictively identify which of a variety of platforms for initiating T cell expansion will work best for an individual undergoing treatment for CLL.

J. INVITATIONS TO PRESENT RESEARCH SEMINARS OR LECTURES

J.1 Invited Lectures at National and International Institutions

10/2018 "Engineering adaptive immunity through mechanobiology", 2nd International Symposium on Mechanomedicine, New York, NY.
09/2017 "Engineering Adaptive Immunity", Department of Biomedical Engineering, Rensselaer Polytechnic Institute, Troy, NY.
07/2017 "Engineering Immunity Through Biomaterials", Cyrus Tang Hematology Center, Soochow University.
04/2017 "Engineering Adaptive Immunity Through Mechanobiology and Micropatterning", Department of Chemical and Biological Engineering, Princeton University

08/2016 "Cellular mechanics in immune engineering", Chinese University of Hong Kong, China.
08/2016 "Cellular mechanics in immune engineering", South University of Science and Technology of China, China.
08/2016 "Cellular mechanics in immune engineering", Mechanobiology Institute, National University of Singapore, Singapore.
03/2015 "Engineering of Immune Cell Function", Suzhou Institute of Nano-Tech and Nano-Bionics (SINANO), Suzhou, China.
03/2015 "Engineering of Immune Cell Function", College of Nanotechnology, Soochow University, Suzhou, China.
05/2014 "Microscale Engineering of Cell Signaling", Department of Biochemistry, The University of Hong Kong, Hong Kong, China.
05/2014 "Microscale Engineering of Cell Signaling", Department of Mechanical and Biomedical Engineering, City University of Hong Kong, Hong Kong, China.
03/2014 "Engineering Immunity", College of Nanotechnology, Soochow University, Suzhou, China.
02/2014 "Microscale Engineering of Cell Signaling", School of Engineering and Applied Sciences, Harvard University.
03/2013 "Engineering of Immune Cell Function Through Mechanobiology", College of Nanotechnology, Soochow University, Suzhou, China.
03/2013 "Engineering of Immune Cell Function Through Biomaterials", Department of Mechanical Enigneering, Tsinghua University, China.
02/2013 "Micro- and Nano-scale Engineering of Immune Cell Signaling", New York Nanoscience Discussion Group, New York University, USA.
04/2012 "Micro- and Nano- Engineering of Immunity", "Nanomedicine, Molecular Imaging, and Drug Delivery" seminar series, Mount Sinai School of Medicine, USA.
05/2011 "Micro- Engineering of Cell Signaling", Deparmtent of Biomedical Engineering Seminar Series, City College of New York, USA.
03/2010 "Micro- and Nano-scale Engineering of Immune Cells", Suzhou Institute of Biomedical Enginneering and Technology, Suzhou, China.
03/2010 "Micro- and Nano-scale Engineering of Immune Cells", College of Chemistry, Chemical Engineering, and Materials Science, Soochow University, Suzhou, China.
03/2010 "Micro- and Nano-scale Engineering of Immune Cells", Suzhou Institute of Nano-tech and Nano-bionics, Suzhou, China.
02/2010 "Micro- and Nano-scale Engineering of Cell Signaling", Department of Mechanical Engineering", Stanford University, USA
01/2010 "Nanoscale Biocomplexity of the Cell Interface and Signaling", Department of Biomedical Engineering, University of California, San Diego, USA.
01/2010 "Nanoscale Biocomplexity of the Cell Interface and Signaling", Department of Nanoengineering, University of California, San Diego, USA.
01/2010 "Spatially Resolved Cell Signaling at Micro- to Nano-Scales", Department of Pharmacology & Systems Therapeutics, Mount Sinai School of Medicine, USA.
03/2009 "Nanoscale Engineering of Immune Cell Function", Irving Institute Nanotechnology Seminar Series, Columbia University, USA.
02/2009 "Micro- and Nano-scale Engineering of the Cellular Environment", Deparmtent of Biomedical Engineering Seminar Series, City College of New York, USA.
03/2008 "Engineering Cell Function Through Micro- and Nano-Structured Surfaces", Southeast Unviersity, China.
03/2008 "Engineering Cell Function Through Micro- and Nano-Structured Surfaces", Suzhou Institute of Nano-tech and Nano-Bionics, China.
03/2008 "Engineering Cell Function Through Micro- and Nano-Structured Surfaces", Zhejiang University, China.
03/2008 "Engineering Cell Function Through Micro- and Nano-Structured Surfaces", Shanghai Jiaotong University, China.

04/2006 "Multifunctional Surfaces: Integration of Signals by Cells", Dept. of Chemistry, Stanford University, USA.
11/2003 "Micro-scale Biocomplexity Captured *in vitro*", Dept. of Physiology and Cellular Biophysics, College of Physicians and Surgeons, Columbia University, USA.

J.2 Invited Lectures at National and International Conferences and Symposiums

12/2018 "Sample Sparing Chambers for Microscopy on Engineered Surfaces", Development of Sample Sparing Assays for Monitoring Immune Responses, Rockville, MD.
06/2017 "Force Generation and Mechanosensing in T Cells", 2017 FASEB Science Research Conference: Signal Transduction in the Immune System, Snowmass, CO.
01/2017 "T cell mechanobiology", 2017 Cellular and Molecular Bioengineering Conference, Kohala Coast, USA.
12/2015 "T Cell Mechanosensing: Biomechanics and Immunotherapy", 2015 ASCB Annual Meeting, San Diego, USA.
05/2014 "T cell Mechanobiology: Molecular Mechanisms to Immunotherapy", The 1st International Workshop on Multiscale Mechanobiology, Hong Kong (2014).
03/2013 "Directing the Immune Response Through Biomaterials", ACS 245th National Meeting, New Orleans, LA.
10/2012 "Capturing Cell-Cell Communication on Micro-/Nano-Engineered Surfaces", AVS 59th Annual International Symposium and Exhibition, Tampa, FL.
01/2011 "Dissecting Cell Signaling with Micropattered Surfaces", Rising Star symposium, 2011 BMES-SPRBM Conference on Cellular and Molecualr Bioengineering, Miami, FL.
12/2009 "Nanoengineering of immune cell function", 2009 MRS Fall Meeting, Boston, MA.
10/2009 "Coordinating neural stem cell function through nanoengineering", 2009 ASNM Inaugural Conference, Potomac, MD.
06/2009 "Capturing the Nanoscale Organization of the Immune Synapse on Engineered Materials", 2nd International Conference from Nanoparticles & Nanomaterials to Nanodevices & Nanosystems; Rhodes, Greece. *Presenter and Session Chair*
05/2009 "Capturing the Micro- and Nano-scale Structure of the Immune Synapse", Symposium: New Tools and Technologies in BioMembrane Science", Purdue University, IN, USA
05/2009 "Engineering the T cell Interface", 3rd Annual Awardees Meeting of the NIH Nanomedicine Development Centers, Washington, DC
09/2008 "Engineering Cell Function Through Micro- and Nano-Fabrication", Cornell Nanoscale Science and Technology Facility Symposium on Nanobiology, New York, NY
09/2007 "Integrating BME Design with Entrepreneurship", 2007 Annual Fall Meeting of the Biomedical Engineering Society, Los Angeles, CA
04/2007 "Multicomponent, Biomolecularly-inspired Surfaces for Advanced Guidance of Neurons", 2007 MRS Spring Meeting, San Francisco, CA

J.3 Other Invited Lectures

K. SERVICE TO SCHOOL AND UNIVERSITY

K.1 Department Committees and Programs

2018- *Chair*, Faculty Search Committee for Bioinformatics / Single Cell
2013-15 *Chair*, Faculty Search Committee for Systems Biology
2012- *Secretary*, Department of Biomedical Engineering
2007- *Member,* Biomedical Engineering Graduate Curriculum Committee
2004- *Member*, Biomedical Engineering Undergraduate Curriculum Committee
2007-09 *Co-chair and Member*, Faculty Search Committee for Neuroengineering
2007-09 *Member*, Biomedical Engineering Laboratory Committee
2007-11 *Aumbuds*, Biomedical Engineering
2006-12 *Chair* and *Member*, Seminar & Colloquum Committee

2005 *Member*, Faculty Search Committee for Cell and Tissue Engineering Track
2004-09 *Faculty Advisor/Coordinator*, BME Student Chapters of (BMES, GraBME, EMBS, SFB)
2004-09 *Freshman/Sophomore Advisor,* Biomedical Engineering
2004 *Member*, Faculty Search Committee for Bioimaging Track
2004-07 *Member*, BME Administrative Committee
2004-07 *Faculty Secretary,* Biomedical Engineering
2003-04 *Local Arrangementst Committee*, BME Symposium for Columbia 250 Celebration
2003-09 *Academic Advisor*, BME Undergraduate and Graduate Students

K.2 School and University Committees and Programs

2016- *Member*, Precision Medicine Pilot Award Review Committee
2015- *Member*, Selection and menotoring committee for Columbia University students interviewing for Rhodes, Marshall, Mitchell, and Hertz awards (Office of Global Programs)
2014- *Member*, SEAS Faculty Tenure and Promotions Committees
2014- *Member*, RISE Application Review Committee
2012- *Member,* Institutional Biosafety Committee
2013 *Member*, Blavatnik Life Sciences Committee
2013-14 *Member*, SEAS Faculty Taskforce on CVN and Online Education

L. SERVICE TO PROFESSION

L.1 Membership in Professional Societies

2014- *Member*, American Society for Cell Biology
1996- *Member,* Biomedical Engineering Society
2000-17 *Member*, Biophysical Society
1996- *Member,* Society for Biomaterials, SIG Treasurer, Immune Engineering
1998-06 *Member,* American Chemical Society
2007-09 *Member*, Materials Research Society
1997-05 *Member,* AVS

L.2 National and International Committees

2005 *Member,* Society for Biomaterials Membership Committee

L.3 Member of Federal and International Review Panels

2014- *Permanent Member*, National Institutes of Health, BMBI
2015-16 *Reviewer*, National Institutes of Health, NIAID P01 panel
2013 *Reviewer*, National Institutes of Health, NIAAA Transformation Research Award Application
2011 *Reviewer,* National Science Foundation, BIO/DBI- Division of Biological Infrastructure.
2011- *Reviewer,* National Science Foundation, BMMB- Biomechanics and Mechanobiology.
2010-11 *Reviewer*, National Institutes of Health, NCI Special Emphasis Panel
2010 *Reviewer*, National Institutes of Health, VA Merit Review, Spinal Cord Injury & Regenerative Medicine
2009 *Reviewer,* National Institutes of Health, ZRG1 BST-M (58), Challenge Grants Panel 4
2009 *Reviewer,* National Science Foundation, CHE- Chemistry of Life Processes Unit.
2009 *Reviewer*, Italian Ministry of Health.

L.4 Organizer and Chair of Meetings and Symposia

2015 *Session Co-chair,* "Cellular and Molecular Mechanobiology: New Approaches, Systems, and Responses", 2015 American Society for Cell Biology Annual Meeting.

2015 *Track Co-chair,* "Immune Engineering", 2015 Annual Meeting & Exposition, Society for Biomaterials.
2011 *Track Co-chair*, "Neuroengineering", 2011 Annual Meeting of the Biomedical Engineering Society.
2011 *Reviewer*, "Nano to Micro", 2011 Annual Meeting of the Biomedical Engineering Society.
2011 *Session Co-chair*, "Biomaterials", 2011 Northeast Bioengineering Conference.
2010 *Guest co-Editor*, "Special Issue: Cell Mechanics and Signaling: From Micro to Nano", *Cellular and Molecular Bioengineering*.
2010 *Co-Chair*, "Cell-Cell Interactions", Annual Meeting of the Biomedical Engineering Society
2008 *Discussion Leader*, "Neural Interfaces" Gordon Resarch Conference (GRC) on Biointerfaces
2008 *Co-Chair,* "Cell and Molecular Mechanics", Annual Meeting of the Biomedical Engineering Society
2006 *Organizer and Co-Chair, "*Neural Microsystems and Instrumentation" Session, IEEE Engineering In Medicine and Biology Society

L.5 Reviewer of Manuscripts, Book Chapters, and Conference Abstracts

Reviewer for Journal Manuscripts

Acta Biomaterialia
ACS - Nano
Biochimical et Biophysica Acta – Molecular Cell Research
Cell
Cellular and Molecular Bioengineering
HFSP Journal
Journal of the American Chemical Society
Journal of Biomedical Materials Research
Journal of Structural Biology
Langmuir
Molecular and Cellular Biomechanics
Nano Letters
Nanotechnology
Nature Communications
Nature Materials
Nature Nanotech
Nature Protocols
Proceedings of the National Academy of Science, USA
Scientific Reports
Small
Soft Matter
Tissue Engineering

Reviewer for Book Chapters/Outlines

Biomedical Engineering, Elsevier, Ltd.
Cambridge University Press
Philosophical Transactions A

Reviewer for Conference Abstracts

Biomedical Engineering Society
Society for Biomaterials

M. OUTREACH ACTIVITIES AND COMMUNITY SERVICE

2011- *Lecturer and mentor*, The Center for Excellence in Youth Education, Mount Sinai School of Medicine.

2011 *Research Advisor*, "Molecular Nanobots", FIRST LEGO LEAGUE team of New York Public School 52, Bronx, NY.

2007- *Co-Host,* Science day with Collegiate School, introducing 40+ lowerschool students (4^{th} grade) to Biomedical Engineering research.