

UNYOUNG (ASHLEY) KIM

Bioengineering Department
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CURRICULUM VITAE

1. Education

a) Institutes of Higher Education

Ph.D. in Mechanical Engineering, University of California, Santa Barbara, 2009

Certificate in College and University Teaching (CCUT), University of California, Santa Barbara, 2009

M.S. in Mechanical Engineering, Korea Advanced Institute of Science and Technology (KAIST), 2001

B.S. in Mechanical Engineering, Korea Advanced Institute of Science and Technology (KAIST), 1999

b) Dissertation

Title: “Development of Novel Microfluidic Cell Sorters Using Dielectrophoresis and Magnetophoresis”

Advisor: H. Tom Soh, University of California, Santa Barbara, 2009.

c) Academic Honors

1. David Packard Junior Fellow, Department of Electrical Engineering, Bioengineering Program, Santa Clara University, Santa Clara, CA, September 2009 – August 2011.
2. Jeff and Karen Miller Fellow, Center for Science, Technology and Society for developing novel technologies to address basic human needs of people in underserved communities worldwide, 2011 – Present.
3. University Education Partnership Program Fellowship, Lawrence Livermore National Laboratory, 2004 – 2009.
4. Merit Fellowship of Mechanical Engineering Department, University of California, Santa Barbara. 2004.
5. KAIST Chancellor’s Fellowship, Korea Advanced Institute of Science and Technology, 1995 – 1996.

2. Teaching and Related Experience

a) Teaching Experience

1. Assistant Professor, Santa Clara University, September 2009 – Present.

2. Instructor of Record, University of California, Santa Barbara, 2008 – 2009.
3. Teaching Assistant, University of California, Santa Barbara, 2004 – 2005.

Courses Taught at Santa Clara University

1. BIOE 10 – Introduction to Bioengineering [Spring 2012, Spring 2014, Spring 2015].
2. BIOE 100 – Research Seminar [Spring 2010].
3. #BIOE 155 – Biological Transport Phenomena [Winter 2010, Winter 2011, Winter 2012, Winter 2013, Winter 2014, Winter 2015].
4. #BIOE/ELEN 161/161L – Biosensors/Bioinstrumentation [Fall 2009, Spring 2010, Fall 2010, Spring 2011, Fall 2011, Fall 2012, Fall 2013, Fall 2014].
5. #BIOE 174/ENGR 254 – Microfabrication and Microfluidics for Bioengineering [Spring 2011, Winter 2012, Winter 2014].
6. #BIOE 194 – Senior Design Project I [Fall 2010, Fall 2012, Fall 2013].
7. #BIOE 195 – Senior Design Project II [Winter 2010, Winter 2011, Winter 2015].
8. #BIOE 196 – Senior Design Project III [Spring 2010, Spring 2011, Spring 2015].
9. BIOE 199 – Independent Research [Winter 2012, Spring 2012, Fall 2012, Winter 2013, Spring 2013, Fall 2013, Winter 2014, Spring 2014, Fall 2014, Winter 2015].
10. #BIOE 276 – Microfluidics and Lab-on-a-Chip [Spring 2014, Spring 2015].
11. BIOE 297 – Directed Research [Fall 2012, Winter 2013, Spring 2013, Fall 2014, Winter 2015, Spring 2015].
12. BIOE 397 – Masters Thesis Research [Fall 2013, Fall 2014, Winter 2015, Spring 2015].

Indicates courses that I created and taught for the first time at Santa Clara University

Courses Guest Lectured at Santa Clara University

1. ENGR 1 – Introduction to Engineering [Fall 2009, Fall 2010, Winter 2011, Fall 2011, Fall 2013, Fall 2014, Spring 2015].
2. ENGR 249 – Topics in Bioengineering [Fall 2009, Fall 2010].
3. BIOE 10 – Introduction to Bioengineering [Spring 2011].

Courses Taught at University of California, Santa Barbara

1. ME 291 – Physics of Transducers [Fall 2008, advanced graduate course].
2. ME 6 – Electrical and Electronic Circuits [Winter 2009, upper-division required course].

b) Other Academic Experience

1. Research Assistant, University of California, Santa Barbara, 2004 – 2009.
2. Research Assistant, Korea Advanced Institute of Science and Technology, 1999 – 2001.

3. Scholarly Work

a) Publications

(* indicates undergraduate co-author)

Peer-Reviewed Journal Articles

1. **U. Kim**, * S. Ghanbari, * A. Ravikumar, J. Seubert, and S. Figueira. “Rapid, Affordable, and Point-of-Care Water Monitoring via a Microfluidic DNA Sensor and a Mobile Interface for Global Health”, *IEEE Journal of Translational Engineering in Health and Medicine* (1) 2168-2372 (2013).
2. **U. Kim** and H.T. Soh, “Simultaneous, Marker Specific Sorting of Multiple Bacterial Targets Using integrated Dielectrophoresis/Magnetophoresis Activated Cell Sorter (iDMACS)”, *Lab on a Chip* (9) 2313-2318 (2009).
3. **U. Kim**, J. Qian, S. Kenrick, P.S. Daugherty, and H.T. Soh, “Multitarget Dielectrophoresis Activated Cell Sorter”, *Analytical Chemistry*, 80, 8656-8661 (2008).
4. J.D. Adams, **U. Kim** and H.T. Soh, “Multitarget Magnetic Activated Cell Sorter (MT-MACS)”, *Proceedings of the National Academy of Sciences, USA*, 105, 18165-18170 (2008).
5. **U. Kim**, C-W Shu, K.Y. Dane, P.S. Daugherty, J.Y. Wang, and H.T. Soh, “Selection of Mammalian Cells According to Cell-Cycle Phase using Dielectrophoresis”, *Proceedings of the National Academy of Sciences, USA*, 104, 20708-20712 (2007).

Works in Progress

1. * Samuel Pontrelli, * Ian Nova, and Unyoung Kim. “Novel Cellulose Paper Device towards Affordable, Equipment-free, and Specific Detection of Bacterial Pathogens.”
2. * J. Marcial Protilla, and Unyoung Kim. “Toward a novel electrolysis actuated micropump for implantable drug delivery applications.”
3. Unyoung Kim, * Jessica VanderGiessen, * Benjamin Demaree, and * Alexander Sibole. “Development of Low-Cost Plastic Microfluidic Sensors toward Rapid and Point-of-Use Detection of Arsenic in Drinking Water for Global Health.”

Conference Proceedings

1. **U. Kim**, * W. Leineweber, * M. Williams, J. Gonzales, and S. Figueira. “Affordable, Sensitive, Point-of-Care Bacterial Detection through Paper-based Device for Resource Limited Settings”, *Proceedings of the IEEE Health Innovation and Point-*

- Of-Care Technologies Conference 2014, The IEEE International Conference on Health Innovation and Point-Of-Care Technologies, (1-page, peer-reviewed paper).
2. * A. Michaelian, * C. Truong, and **U. Kim**. “Compact, Low-power Micropump via Electrolysis and Catalytic Recombination towards Integrated Microfluidic Systems”, Proceedings of the BMES Annual Meeting (BMES 2014), The Biomedical Engineering Society Annual Meeting, 2014, (1-page, peer-reviewed paper).
 3. **U. Kim**, * J. VanderGiessen, and X. Savarimuthu. “Implementation of Electrochemical Sensors in Arsenic-contaminated Areas of West Bengal in India toward Rapid and Point-of-Use Detection of Arsenic in Drinking Water”, Proceedings of the IEEE Global Humanitarian Technology Conference (GHTC 2014), The IEEE Global Humanitarian Technology Conference, (4-page, peer-reviewed paper).
 4. * A. Michaelian, * C. Truong, and **U. Kim**. “Monolithic, Low-power Micropump towards Integrated Microfluidic Systems”, Proceedings of the 18th International Conference on Miniaturized Systems for Chemistry and Life Sciences (MicroTAS 2014), The 18th International Conference on Miniaturized Systems for Chemistry and Life Sciences, 2014 (2-page, peer-reviewed paper).
 5. **U. Kim**, * B. Demaree, * J. VanderGiessen, * M. Reynolds, * K. Perricone. “Development of Low-Cost Plastic Microfluidic Sensors toward Rapid and Point-of-Use Detection of Arsenic in Drinking Water for Global Health”, Proceedings of the IEEE Biomedical Circuits and Systems (BioCAS 2013), The IEEE Annual International Biomedical Circuits and Systems Conference, Rotterdam, 2013 (4-page, peer-reviewed paper).
 6. **U. Kim**, * B. Demaree, * J. VanderGiessen, * M. Reynolds, * K. Perricone, J. Seubert, * Z. Elahi, S. Krishnan, and S. Figueira. “Electrochemical Detection of Arsenic via a Microfluidic Sensor and Mobile Interface towards Affordable, Rapid, and Point-of-Use Water Monitoring”, Proceedings of the IEEE Healthcom 2013, The 15th IEEE International Conference on E-Health Networking (Healthcom’13), application and Services, Lisbon, 2013 (4-page, peer-reviewed paper).
 7. * J. M. Portilla and **U. Kim**. “Low-power, Self-contained, Reciprocating Micropump through Electrolysis and Catalyst-driven Recombination toward Drug Delivery Applications”, Proceedings of the Micro ElectroMechanical Systems (MEMS 2013), The 26th IEEE Annual International Conference on Micro ElectroMechanical Systems, Taiwan. 2013 (4-page, peer-reviewed paper).
 8. **U. Kim**, * A. Ravikumar, J. Seubert, and S. Figueira. “Detection of Bacterial Pathogens through Microfluidic DNA Sensors and Mobile Interface toward Rapid, Affordable, and Point-of-Care Water Monitoring”, Proceedings of the IEEE Point-of-Care Healthcare Technologies, The Annual International IEEE EMBS Special Topic Conference on Point-of-Care Healthcare Technologies, Bangalore, 2013 (4-page, peer-reviewed paper).
 9. * S. Pontrelli, * I. Nova, and **U. Kim**, American Chemical Society (ACS) Spring National Meeting, New Orleans, 2013.

10. * J. M. Portilla, C. Ledesma, A. Curiel, S. Krishnan and **U. Kim**, “*Implantable Electrolysis Micropump with Bubble*”, Proceedings of the Engineering in Medicine and Biology Society (IEEE EMBC 2012), The 34th Annual International Conference of the IEEE EMBS, San Diego, 2012 (1-page, peer-reviewed paper).
11. * S. Ghanbari, * N. Giustini, * C. Mar, * P. Doshi and **U. Kim**, “*Detection of Waterborne Pathogens Using Electrochemical DNA Sensors for Resource Limited Settings*”, Proceedings of the Biomedical Engineering Society Annual Meeting (BMES 2011), The 2011 BMES Annual Meeting, Connecticut, 2011.
12. C. Rogers, M.G. Bupp, **U. Kim**, G. DeKrey and S. Stranford, “*Successful Integration of Practical Flow Cytometric Experience into Undergraduate Education*”, Proceedings of the American Association of Immunologists Annual Meeting (Immunology 2011), The 98th AAI Annual Meeting, San Francisco, 2011.
13. **U. Kim**, K.Y. Dane and H.T. Soh, “*Simultaneous Sorting of Multiple Bacterial Targets Using Integrated Dielectrophoresis / Magnetophoresis Activated Cell Sorter*”, Proceedings of MicroTAS 2009, The 13th International Conference on Miniaturized Systems for Chemistry and Life Sciences, (2-page, peer-reviewed paper).
14. J.D. Adams, **U. Kim** and H.T. Soh, “*High Throughput, Multi-Target Magnetophoretic Separation*”, Proceedings of MicroTAS 2008, The 12th International Conference on Miniaturized Systems for Chemistry and Life Sciences, (2-page, peer-reviewed paper).
15. **U. Kim**, J. Qian, P.H. Bessette, P.S. Daugherty, H.T. Soh, “*Simultaneous Sorting of Multiple Strains of Bacteria Using Dielectrophoresis*”, Proceedings of MicroTAS 2007, The 11th International Conference on Miniaturized Systems for Chemistry and Life Sciences, (2-page, peer-reviewed paper).
16. **U. Kim**, C-W Shu, J.Y. Wang, and H.T. Soh, “*Cell Synchronization using Dielectrophoresis*”, Proceedings of MicroTAS Conference 2006, The 10th International Conference on Miniaturized Systems for Chemistry and Life Sciences, (2-page, peer-reviewed paper).

b) Patents Awarded and Filed

1. **U. Kim**, S. Figueira, S. Krishnan, “*Affordable electrochemical detection of arsenic*”, US Provisional Patent. Filed February 18, 2015.
2. S. Oh, A.K. Singh, Y. Zhang, D. Nawaratha, **U. Kim**, P.S. Daugherty, H.T. Soh, B.S. Ferguson, “*Microfluidic magnetophoretic device and methods for using the same*”, US Patent No. 7807454 issued December 6, 2011.
3. H.T. Soh, J.Y.J. Wang, **U. Kim**, X.S. Hu, J. Qian, C. Meinhart, “*Dielectrophoretic particle sorter*”, US Patent Application No. 11/288,016.

c) Presentations/Invited Seminars

1. Affordable, Sensitive, Point-of-Care Bacterial Detection through Paper-based Device for Resource Limited Settings
The IEEE International Conference on Health Innovation and Point-Of-Care Technologies, Seattle, WA, 2014.
2. Compact, Low-power Micropump via Electrolysis and Catalytic Recombination towards Integrated Microfluidic Systems
The Biomedical Engineering Society Annual Meeting, San Antonio, TX, 2014.
3. Implementation of Electrochemical Sensors in Arsenic-contaminated Areas of West Bengal in India toward Rapid and Point-of-Use Detection of Arsenic in Drinking Water
The IEEE Global Humanitarian Technology Conference, San Jose, CA, 2014.
4. Monolithic, Low-power Micropump towards Integrated Microfluidic Systems
The 18th International Conference on Miniaturized Systems for Chemistry and Life Sciences, San Antonio, TX, 2014.
5. Development of Low-Cost Plastic Microfluidic Sensors toward Rapid and Point-of-Use Detection of Arsenic in Drinking Water for Global Health
The IEEE Annual International Biomedical Circuits and Systems Conference, Rotterdam, 2013
6. Electrochemical Detection of Arsenic via a Microfluidic Sensor and Mobile Interface towards Affordable, Rapid, and Point-of-Use Water Monitoring
The 15th IEEE International Conference on E-Health Networking (Healthcom'13), application and Services, Lisbon, 2013
7. Amperometric Detection of Bioamines in *Cancer borealis* Using Microchip Capillary Electrophoresis with Micellar Electokinetic Chromatography
Advanced Biosciences Summer Symposium, August, 2013, Santa Clara, CA
8. Electrolysis Micropump with Catalyst-driven Cyclic Operation
Advanced Biosciences Summer Symposium, August, 2013, Santa Clara, CA
9. Novel Cellulose Paper Device towards Affordable, Equipment-free, and Specific Detection of Bacterial Pathogens
American Chemical Society (ACS) Spring National Meeting, New Orleans, 2013
10. Low-power, Self-contained, Reciprocating Micropump through Electrolysis and Catalyst-driven Recombination toward Drug Delivery Applications
The 26th IEEE Annual International Conference on Micro ElectroMechanical Systems, Taiwan, 2013
11. Detection of Bacterial Pathogens through Microfluidic DNA Sensors and Mobile Interface toward Rapid, Affordable, and Point-of-Care Water Monitoring
The Annual International IEEE EMBS Special Topic Conference on Point-of-Care Healthcare Technologies, Bangalore, 2013

12. Electrochemical Arsenic Detection in Drinking Water using Paper-based Microfluidic Devices
Advanced Biosciences Summer Symposium, August, 2012, Santa Clara, CA
13. Amperometric Detection of Bioamines in *Cancer borealis* Using Microchip Capillary Electrophoresis with Micellar Electokinetic Chromatography
Advanced Biosciences Summer Symposium, August, 2012, Santa Clara, CA
14. Electrolysis Micropump with Catalyst-driven Cyclic Operation
Advanced Biosciences Summer Symposium, August, 2012, Santa Clara, CA
15. Detection of Pathogens Using Inertial Focusing and Electrochemical DNA Sensors for Resource-limited Settings
Annual Advanced Biosciences Symposium, January, 2012, Santa Clara, CA
16. Detection of Waterborne Pathogens Using Electrochemical DNA Sensors for Resource Limited Settings
Biomedical Engineering Society Annual Meeting (BMES 2011), October, 2011, Connecticut
17. Development of Novel Microfluidic Cell Sorters Using Dielectrophoresis and Magnetophoresis
Roger Howe group, Stanford University, August, 2011, Stanford, CA
18. Successful Integration of Practical Flow Cytometric Experience into Undergraduate Education
American Association of Immunologists Annual Meeting (Immunology, May 2011, San Francisco, CA
19. Detection of pathogens using electrochemical DNA sensors
Bio-Info-Nano REU Conference, NASA Ames Research Center, August, 2010, Mountain View, CA
The poster won an award for the project “of greatest benefit to society”.
20. Probing mechanical properties of stem cells using atomic force microscopy
Bio-Info-Nano REU Conference, NASA Ames Research Center, August, 2010, Mountain View, CA
21. Microfluidic Diagnostic Technologies for Global Public Health
Product Development for Social Benefit, Center for Science, Technology, and Society Colloquium, May, 2010, Santa Clara, CA
22. Development of Novel Microfluidic Cell Sorters Using Dielectrophoresis and Magnetophoresis
Interdisciplinary Faculty Seminar, Santa Clara University, March, 2010, Santa Clara, CA
23. Development of Novel Microfluidic Cell Sorters Using Dielectrophoresis and Magnetophoresis
Santa Clara University Electrical Engineering Graduate Seminar, March, 2010, Santa Clara, CA

24. Simultaneous Sorting of Multiple Bacterial Targets Using Integrated Dielectrophoresis / Magnetophoresis Activated Cell Sorter
MicroTAS Conference 2009, November 1-5, 2009, Jeju, Korea.
25. Simultaneous, Marker Specific Sorting of Multiple Bacterial Targets using Dielectrophoresis
Institute for Collaborative Biotechnologies Army-Industry Collaboration Conference, February, 12-13, 2008, Santa Barbara, CA.
26. Simultaneous Sorting of Multiple Bacterial Targets in Microfluidic Channels
Center for Nanostructure Innovation for Defense Review Meeting, December 4-5, 2007, UCLA, CA.
27. Simultaneous Sorting of Multiple Strains of Bacteria Using Dielectrophoresis
MicroTAS Conference 2007, October 7-11, 2007, Paris, France.
28. Cell Synchronization using Dielectrophoresis
MicroTAS Conference 2006, November 5-9, 2006, Tokyo, Japan.
29. Dielectrophoretic Synchronization of Mammalian Cells
Center for Nanostructure Innovation for Defense Review Meeting, June 26-27, 2006, Santa Monica, CA.
30. Cell Synchronization using Dielectrophoresis
Institute for Collaborative Biotechnologies Army-Industry Collaboration Conference, May 10-11, 2006, UCSB, CA.

d) Grants Received

1. Hayes Fellowship, Santa Clara University, \$ 6,000 for Selective Bacterial Detection through Affordable, Equipment-Free Device for Resource-Limited Areas. 2014 – present.
2. Roelandts Fellowship, Center for Science, Technology, and Society, \$ 2,500 for Novel Microfluidic Cellulose Paper Device Towards Affordable, Equipment-free, and Specific Detection of Bacterial Pathogens. 2014 – Present.
3. Roelandts Fellowship, Center for Science, Technology, and Society, \$ 2,500 for Electrochemical Detection of Arsenic Using a Microfluidic Device. 2014 – Present.
4. Tech Museum Grant, \$ 15,000 for Water Filtering and Solutions to Detect Water Contaminants. 2013 – Present.
5. Roelandts Fellowship, Center for Science, Technology, and Society, \$ 2,500 for water pathogen detection. 2013 – Present.
6. Roelandts Fellowship, Center for Science, Technology, and Society, \$ 1,500 for paper-based detection of bacterial pathogen. 2013 – Present.
7. Kuehler Grant, School of Engineering, Santa Clara University, \$ 4,033 for developing a paper-based microfluidic device for the detection of arsenic in groundwater sources. 2013 – 2014.

8. HP Grant, \$ 40,000 for Social Innovation Partnership: Mobile Device for Detection of Bacterial Pathogens through Microfluidic DNA Sensors Toward Rapid, Affordable, Point-of-Care Water Monitoring. 2013 – 2014.
9. Clare Booth Luce Research Scholar Award, \$ 10,000 for planar micropump for lab-on-a-chip, Summer 2013.
10. Jeff and Karen Miller Faculty Fellowship in Frugal Innovation, \$ 5,662 for developing a paper-based microfluidic device for the detection of arsenic in groundwater sources. 2012 – 2014.
11. W.F. Keck Foundation, Advanced Biosciences Initiative Interdisciplinary Research Grant, \$ 12,000 for implantable cycle electrolytic micropump for in vivo drug delivery. 2012 – Present.
12. Kuehler Grant, School of Engineering, Santa Clara University, \$ 4,034 for developing a paper-based microfluidic device for the detection of arsenic in groundwater sources. 2012 – Present.
13. Roelandts Fellowship, Center for Science, Technology, and Society, \$ 3,000 for 2DPN water pathogen detection.
14. Roelandts Fellowship, Center for Science, Technology, and Society, \$ 3,000 for electrolysis micropump with bubble recombination.
15. Roelandts Fellowship, Center for Science, Technology, and Society, \$ 3,000 for detection of waterborne pathogens using a microfluidic electrochemical DNA sensor for low resources settings.
16. Technology Steering Committee, \$ 14,231 for photoresist spinner and deionized water system for in-house photolithography with two co-PIs, Spring 2011.
17. Jeff and Karen Miller Faculty Fellowship, \$ 4,786 for accelerating HIV diagnosis/monitoring through compact and low-cost flow cytometry in developing countries with Professor Craig Stephens, 2011 – 2012.
18. Roelandts Fellowship, \$ 3,300 for rapid detection of multiple pathogens using electrochemical DNA sensors, 2010 – 2011.
19. Technology Steering Committee, \$ 50,000 for mask aligner for in-house lithographic fabrication processes with three co-PIs, 2010 – 2011.
20. Fletcher Jones Foundation, \$ 500,000 for Advanced Bioscience Initiative with Professor Amy Shachter, U. Kim (co-PI) and six other co-PIs, 2010 – 2012.
21. Keck Foundation, \$ 250,000 for Advanced Bioscience Initiative with Professor Amy Shachter, U. Kim (co-PI) and four other co-PIs, 2011 – 2013.
22. Bio-Info-Nano RDI, \$ 8,800 for probing mechanical properties of stem cells using atomic force microscopy, Summer 2010.
23. Bio-Info-Nano RDI, \$ 4,000 for development of rapid and sensitive biosensors for rare analytes, Summer 2010.
24. Clare Booth Luce Research Scholar Award, \$ 6,978 for rapid detection of multiple pathogens using electrochemical DNA sensor, Summer 2010.

25. Technology Steering Committee Grant, \$ 38,364 for integration of fluorescence microscopy into the undergraduate curriculum and research, 2009 – 2010.
26. Center for Science, Technology, and Society Research Grant, \$3,300 for rapid detection of multiple pathogens using electrochemical DNA sensor, 2009 – 2010.

e) Research Supervision

Master's Student:

1. Aleen Michaelian, Santa Clara University, Project: Eletrolytic Micropump for Microfluidic Platforms. Expected Date of Graduation: 2015
2. Jessica VanderGiessen, Santa Clara University, Project: Microfluidic Devices for Arsenic Detection in Drinking Water Sources. Expected Date of Graduation: 2015
3. Connie Truong, Santa Clara University, Project: A Microfluidic Device to Identify and Measure Amine Concentrations in *Cancer borealis*. Expected Date of Graduation: 2015
4. Edward Lo, Santa Clara University, Project: Characterizing Lateral Spacing in Acoustic Focusing for Flow Cytometry. 2013
5. Jose Marcial Portilla, Santa Clara University, Project: Electrolysis Micropump with Catalyst-drive Cyclic Operation. 2013
6. Samuel Pontrelli, Santa Clara University, Project: 2DPN Microfluidic Devices for Bacterial Pathogen Detection in Drinking Water Sources. 2013

Senior Thesis:

1. Precise Optical Wand, 2009 – 2010, with Claire Dalton. Provisional patent filed.
2. Detection of Waterborne Pathogens Using Electrochemical DNA Sensors for Resource-limited Settings, 2010 – 2011 with Sarah Ghanbari and Nicholas Giustini.
3. Probing Mechanical Properties of Stem Cells Using Atomic Force Microscopy, 2010 – 2011 with Sandeep Kaur, Lauren Jauregui, and Ariel Virrey. Won Best of Session for Bioengineering.
4. Pathogen Detection by Two-Dimensional Paper Networks, 2011 – 2012 with Sammy Pontrelli, Ian Nova, and Miller Bauer.
5. A Microfluidic Device to Identify and Measure Amine Concentrations in *Cancer borealis*, 2011 – 2012 with Rian Draeger, Kira Kubota, and Elizabeth Sugahara. Co-supervised with Prof. Steven Suljak in Chemistry.
6. Detection of Waterborne Pathogen for the Developing World, 2011 – 2012 with Anusha Ravikumar and Jennifer Batara.
7. Automated Utility Testing Operations (A.U.T.O.), 2011 – 2012 with John Fresquez and Zuhayr Elahi. Co-advised with Raffi Attarian at Medtronic. Medtronic funded the project.

8. Electrolytic Micropump through Bubble Recombination, 2011 – 2012 with Jose Portilla, Christopher Ledesma, and Albenis Curiel. Co-advised with Abdie Tabrizi. *In the process of filing a patent.*
9. Affordable, Self-Contained and Quantitative Microfluidic Device for the Detection of Arsenic Contamination in Groundwater Samples, 2012 – 2013 with Kyle Perricone and Mary Reynolds.
10. Amperometric Detection of Bioamines in *Cancer borealis* Using Microchip Capillary Electrophoresis Integrated with Micellar Chromatography, 2012 – 2013 with Jason Howard, Christina Shuh, and Ajay Fernandez.
11. Detection of Waterborne Pathogen, 2012 – 2013. with Allison Kamiya.
12. Electrolysis Powered Micropump Utilizing Planar Check Valves, 2013-2014 with Aleen Michaelian and Connie (the team won the first place in Bioengineering Session 1).
13. Microchip Capillary Electrophoresis, 2013 – 2014 with Scott Hardy, Daniel Shull, and Mark Vinopal.
14. Electrochemical Detection of Arsenic Using a Microfluidic Sensing Platform, 2013 – 2014 with Ben Demaree, Allie Sibole, and Jessica VanderGiessen.

4. Service to the University and the Profession

a) Service to the University

1. Served as the Acting Director for Bioengineering Program, Spring 2012.
2. Bioengineering Faculty/Staff Search Committee, 2010 – 2015.
3. Mechanical Engineering Faculty Search Committee, 2011 – 2012.
4. Society of Women Engineers (SWE) Faculty Advisor. 2011 – Present.
5. Center for Nanostructure Steering Committee, 2012 – Present.
6. One-Step-Ahead Program: Worked with SWE volunteers for once-a-month Saturday programs to interest high school girls in Engineering. 2011 – Present.
7. Frugal Innovation panelist to give an overview of my work in regard to frugal innovation to faculty, students, parents, and potential students during Frugal Innovation Lab Open House. April 2012.
8. Attended Kern Entrepreneurship Education Network (KEEN) Workshop, "Shaping Entrepreneurial Engineers", Tempe, AZ January, 2011
9. Attended the Women of Vision Awards banquet along with female engineering faculty members and students. 2011 – 2013.
10. Presented to the SOE board members on frugal innovation in regard to my work and global health applications. May 2012.
11. Presented to the SCU board members on frugal innovation in regard to my work and global health applications. May 2013.

12. Participated in the Jesuit Conversations at Santa Clara University, April 2012.
13. Served in leadership roles with four other co-PIs for Advanced Biosciences Initiative from Keck Foundation and Fletcher Jones Foundation to significantly advance SCU's undergraduate bioscience and bioengineering program. Organized annual Biosciences Symposia and workshops and participated in curriculum development. 2010 – Present.
14. Gave departmental presentations, served as tour guide, run information desk, and participated in receptions during Preview Days. 2010 – Present.
15. Presented classes on bioengineering with a hands-on project for SEEDS program. SEEDS is a program that provides local bay area high school students with a special opportunity to explore engineering topics not available through normal high school classes. 2010 – 2011.
16. ENGR 1 task force committee to gather data and make recommendations for a first class freshman engineering experience. Met weekly for discussion, sought recommendations from several departmental meetings, and wrote a report on the examples from other universities. 2011 – 2011.
17. Bioengineering Faculty Search Committee. 2010 – 2011.
18. Served as program judge for First Lego League competition. 2010 – 2011.
19. Served as inductor for the Order of the Engineer ring ceremony. 2011.
20. Participated in GSBI Fellowship program to provide technical advice on the projects from GSBI fellows working on health related applications. 2011.
21. Summer Freshman Advising, 2010 – 2011.
22. Gave Intro to Bioengineering presentation to North Salinas High School Health Academy students. This high school has large underrepresented minority student populations. 2010.
23. Attended Kern Entrepreneurship Education Network (KEEN) Workshop, Orlando, FL. 2010.

b) Service to the Profession

1. Reviewer for *Electrophoresis*, *Lab on a Chip*, *Analytical Chemistry*, and *Langmuir*.
2. Reviewer for IEEE GHTC and ASME IMECE
3. Grant proposal reviewer for British Columbia Innovation Council (BCIC).
4. Fellowship proposal reviewer for NSF GRFP program