

University of California, San Francisco
CURRICULUM VITAE

Name: Shuvo Roy, PhD
Position: Professor, Step 2
 Bioengineering & Therapeutic Sciences
 School of Pharmacy

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EDUCATION

1988 - 1992	Mount Union College, Alliance, OH	B.S.	Magna Cum Laude (General Honors), Physics, Mathematics (Special Honors), and Computer Science	
1992 - 1995	Case Western Reserve University	M.S.	Electrical Engineering and Applied Physics	
1995 - 2001	Case Western Reserve University	Ph.D.	Electrical Engineering and Computer Science	Advisor: Mehran Mehregany

PRINCIPAL POSITIONS HELD

1998 - 2002	Cleveland Clinic	Project Staff	Department of Biomedical Engineering
2002 - 2008	Cleveland Clinic	Assistant Staff	Department of Biomedical Engineering
2008 - 2013	University of California, San Francisco	Associate Professor	Department of Bioengineering and Therapeutic Sciences
2013 - present	University of California, San Francisco	Professor	Department of Bioengineering and

Therapeutic Sciences

OTHER POSITIONS HELD CONCURRENTLY

1998 - 2008	Cleveland Clinic	Co-Director	BioMEMS Laboratory
2000 - 2008	Cleveland Clinic	Faculty	Spine Research Laboratory
2001 - 2008	Cleveland State University	Assistant Professor	Applied Biomedical Engineering Program
2001 - 2008	Case Western Reserve University	Clinical Assistant Professor	Department of Electrical Engineering and Computer Science
2006 - 2008	Case Western Reserve University	Assistant Professor	Department of Molecular Medicine, Cleveland Clinic Lerner College of Medicine
2008 - 2010	Cleveland Clinic	Adjunct Associate Staff	Departments of Nephrology and Biomedical Engineering
2008 - present	California Institute of Quantitative Biosciences (QB3)	Faculty Affiliate	California Institute of Quantitative Biosciences (QB3)
2014 - present	University of California, San Francisco	UCSF Faculty Director	Masters in Translational Medicine (MTM) Program
2014 - present	University of California, San Francisco	Faculty (Joint-Appointment)	Department of Surgery

HONORS AND AWARDS

1989	William and Burdella Carl Mathematics Award	Mount Union College
1992	Senior Physics Prize	Mount Union College
1998	Ruth Barber Moon Graduate Student Award	Case Western Reserve University
1999	Top 40 under 40	Crain's Cleveland Business
2001	Clinical Translation Award	BioMEMS and Biomedical Nanotechnology World Meeting
2003	MIT TR100 Award, 100 Top Young Innovators	Technology Review Magazine
2004	NASA Group Achievement Award, Harsh	NASA

	Environment MEMS	
2004	Ribbon Award, Outstanding Symposium Paper, MRS Fall Meeting	Materials Research Society
2005	Who's Who in Biotechnology	Crain's Cleveland Business
2005	Cleveland Clinic Innovator Award	Cleveland Clinic
2006	Mentor Recognition Award	Cleveland Clinic Science Internship Program
2007	Cleveland Clinic Innovator Award	Cleveland Clinic
2008	Thomas G. Orr Memorial Lectureship	Southwestern Surgical Congress
2008	Harry Wm and Diana V. Hind Distinguished Professorship in Pharmaceutical Sciences II	University of California, San Francisco
2009	Biotech Humanitarian Award Finalist	Biotechnology Industry Organization
2009	2009 Images of the Year Selection	Biomaterials Journal
2009	Deshbandhu CR Das Gold Medal	Deshbandhu CR Das Research Council
2011	mHealth Alliance Award	Vodafone Americas Foundation
2012	UCSF Outstanding Faculty Mentorship Award, Finalist	University of California, San Francisco
2012	Rising Star Award	BayBio Pantheon
2012	Innovation Pathway 2.0 Award	Food and Drug Administration (FDA)
2013	Fellow	Applied Innovation Institute
2013	Invited nominator	Heinz Awards
2015	Innovation in Regulatory Science, Finalist	Burroughs Wellcome Fund

KEYWORDS/AREAS OF INTEREST

Medical Devices, Microelectromechanical Systems (MEMS), Artificial Organs, Sensors, Digital Health, Tissue Engineering, Transducers, Membrane Filtration, Bioartificial Kidney, Microfluidics, Microtextured Substrates, Therapeutics

PROFESSIONAL ACTIVITIES

PROFESSIONAL ORGANIZATIONSMemberships

- 1996 - present Institute of Electrical and Electronics Engineers (IEEE)
 2004 - present Materials Information Society, ASM International
 2012 - present American Society of Nephrology (ASN)
 2014 - present American Society for Artificial Internal Organs (ASAIO)

Service to Professional Organizations

2003 - 2003	Glennan Microsystems Initiative	Steering Committee
2003 - 2008	Nano-Network	Founder, Advisory Board
2000 - 2000	Coventor Workshop on Design Modeling of BioMEMS	Organizer and Host
2002 - 2004	4th& 6th Annual International Symposium on BioMEMS	Conference Chairperson
2003 - 2003	4th Annual BioMEMS and Nanotech World Meeting	Scientific Advisory Board & Session Chair - Clinical Applications, Applying MEMS to Medicine
2004 - 2004	5th Annual BioMEMS and Nanotech World Meeting	Scientific Advisory Board & Session Chair - Minimally Invasive Medical Technology
2004 - 2004	2004 BMES Annual Fall Meeting	Session Chair - From the Nano- to the Micro- Scale in BME
2004 - 2004	The Cleveland Clinic NanoMedicine Summit	Director & Principal Organizer
2004 - 2004	NCI Cancer Nanotechnology Symposium	Chairperson of Steering Committee
2005 - 2005	Ohio Nanotechnology Summit	Chairperson (Biomedicine) & Conference Steering Committee
2006 - 2006	Ohio Nanotechnology Summit	Conference Steering Committee
2006 - 2006	ASME 2006 Summer Bioengineering Conference	Session Chairperson - MEMS
2006 - 2006	CIMTEC 2006, 4th Forum on New Materials	International Advisory Board - Biomedical Applications of Nano Technologies Symposium
2006 - 2006	Materials, Medicine, and Nanotechnology Summit	Co-Director & Principal Organizer

2008 - 2008	Materials and Processes for Medical Devices	Co-Chairperson of Organizing Committee
2008 - 2008	Cleveland NanoMedicine Summit: Nanoparticles for Diagnostics and Therapeutics	Conference Organizing Committee
2009 - present	ASM Medical Materials & Strategic Advisory Committee	Member
2013 - present	American Society of Nephrology (ASN), Dialysis Advisory Group	Member
2014 - 2014	American Society of Nephrology (ASN) - Bioengineering and Informatics	Abstract Review - Chair
2014 - present	San Jose State University, BAMDC	Advisor

SERVICE TO PROFESSIONAL PUBLICATIONS

1999 - present	Referee for: Acta Biomaterialia; Applied Physics Letters; Biomedical Microdevices; Biotechnology and Bioengineering; IEEE Spectrum; IEEE Transactions on Biomedical Engineering; Journal of Biomaterials Science: Polymer Edition; Journal of Magnetism and Magnetic Materials; Journal of Medical Devices, Sensors and Actuators; Journal of Membrane Science; Journal of Microelectromechanical Systems; Journal of Neuroscience Methods; Journal of Tissue Engineering and Regenerative Medicine; Langmuir; Macromolecular Bioscience; Microscopy and Microanalysis; Nano Letters; PLOS One; Tissue Engineering, Sensors and Materials.	
2001 - 2001	Guest Editor, Biomedical Microdevices	
2002 - 2005	Thematic Section Editor and Referee, Biomedical Microdevices	
2003 - present	Editorial Board and Referee, Sensors and Materials	
2005 - present	Associate Editor and Referee, Editorial Board, Biomedical Microdevices	
2011 - present	Editorial Board, Journal of Biosensors & Bioelectronics	
2012 - present	Editorial Board, Medical Instrumentation	

INVITED PRESENTATIONS

INTERNATIONAL

2000	BioMEMS and Biomedical Nanotechnology WORLD; Columbus, OH (invited talk)
2001	BioMEMS and Biomedical Nanotechnology WORLD; Columbus, OH (invited talk)
2005	ASAIO Annual Conference, Washington, DC (invited talk)
2006	ASME 2006 Summer Bioengineering Conference; Amelia Island, FL (plenary talk)
2006	Gordon Research Conference; New London, CT (platform)
2007	Inauguration of Joint Biomedical Engineering Program

- between Ghent University and Free University of Brussels, Ghent, BELGIUM (keynote)
- 2007 Politzer Society Meeting, Cleveland, OH (keynote)
- 2008 ASAIO Annual Conference, San Francisco, CA (plenary talk)
- 2008 Southwest Surgical Congress Meeting, Acapulco, MEXICO (keynote)
- 2008 AVS International Symposium, Boston, MA (invited talk)
- 2009 Endovascular Surgery - Bringing Basic Science to Clinical Practice, Stockholm, SWEDEN (invited talk)
- 2009 Transducers 2009, Denver, CO (invited talk)
- 2010 World Molecular Engineering Network Twentieth Annual Meeting on Structural Biology, Cabo San Lucas, MEXICO (invited talk)
- 2011 ASAIO Annual Conference, Washington, DC (invited talk)
- 2012 American Society of Nephrology, Kidney Week 2012, San Diego, CA (invited talk)
- 2012 ASAIO Annual Conference, San Francisco, CA (invited talk)
- 2012 German-American Frontiers of Engineering Symposium (GAFOE), Potsdam, GERMANY (invited speaker, declined)
- 2013 ASN (American Society of Nephrology) conference, Atlanta, GA (invited talk)
- 2013 ASAIO Annual Conference, Pediatric Day, Chicago, IL (invited talk)
- 2014 Nephro-2014: Nephrology and Therapeutics, Valencia, Spain (invited talk - declined)
- 2014 11th Annual CiDA (Controversies in Dialysis Access) Meeting, Salt Lake City, UT (Invited Talk)
- 2015 ASAIO Annual Conference, Pediatric Day, Chicago, IL (invited talk)
- 2015 Future Day, University of Alberta in Edmonton, Canada, Technology and Medicine Course - The Bioartificial Kidney Using Silicon Filter, Skype (Invited Talk)
- 2015 12th Annual CiDA (Controversies in Dialysis Access) Meeting, New Orleans, LA (Invited Talk)
- 2015 17th Congress of the European Society for Organ Transplantation - Brussels, Belgium (Invited Talk)
- 2015 American Society of Nephrology (ASN), Kidney Week - San Diego, CA (Invited Talk)

NATIONAL

- 2001 BioMEMS; Sunnyvale, CA, 2001 (invited talk); Boston, 2002 (invited talk); Boston, 2004 (invited talk)
- 2004 NASS Spring Meeting; Boca Raton, FL (invited talk)
- 2004 Conference-Workshop on Strategic Research to Enable NASA's Exploration Missions; Cleveland, OH (invited talk)
- 2004 NNI Grand Challenge Workshop; Palo Alto, CA (invited talk)
- 2005 ASEIO Annual Convention, Cleveland, OH (invited talk)
- 2006 Society of Neurological Surgeons, Durham, NC (invited talk)
- 2006 NSF Workshop on Wearable and Implanted Systems for Health Monitoring and Diagnostics, Arlington, VA (invited talk)
- 2007 OMTEC 2007, Chicago, IL (invited talk)
- 2009 Glaucoma Summit, San Francisco (invited talk)
- 2011 French American Biotechnology Symposium Annual Meeting, San Francisco (invited talk)
- 2011 National Nanotechnology Infrastructure Network Symposium (invited talk)
- 2011 Accelerating Predictive Drug Development Through Quantitative Pharmacology Conference, San Francisco, CA (invited panel discussion)
- 2012 Cell Society Annual Meeting, San Diego, CA (Invited talk)
- 2012 Nano Seminar Series, Nanoengineering an Artificial Kidney," Berkeley, CA (invited talk)
- 2012 Dreamforce (Salesforce Conference), Unusual Thinkers Panel, San Francisco, CA (invited presentation)
- 2012 Palo Alto Research Center (PARC), Palo Alto, CA (invited presentation)
- 2012 ANSYS Medical Device Virtual Development Forum, Los Angeles, CA (invited talk)
- 2012 ACOI (American College of Osteopathic Internists), Indian Wells, CA (Invited talk)
- 2013 NIH/NBIB Seminar, Bethesda, MD (invited talk)
- 2014 National Kidney Foundation (NKF), 46th Annual Medical Symposium, San Francisco, CA (Invited Talk)
- 2014 BiomeDevice Conference, San Jose, CA (Invited Talk)

- 2015 American Society of Transplantation (AST) Cutting Edge of Transplantation (CEOT) - The Implantable Bioartificial Kidney, Phoenix, AZ (Invited Talk)
- 2015 7th Annual Bay Area Biomedical Device Conference, San Jose, CA (Invited Talk)
- 2015 Kidney Health Initiative, American Society of Nephrology - Washington DC (Invited Talk)
- PROFESSIONAL MEDIA FEATURES (selected)
- 1999 Crain's Cleveland Business, "The Goal - Inside Out Surgery: Clinic Researchers Work on Smart Catheter Parts"
- DesignFax, "MEMS and Micromachining in the New Millennium: Biomedical Applications Aid Surgery, Diagnosis, Drug Delivery, and More"
- 2001 Small Times, "Doctors Find Faster Way to Stimulate Bone Growth"
- Small Times, "Buckeye State is Going Biotech to Create New Base"
- Small Times, "Smarter Tools Will Help Neurosurgeons Work More Accurately, Researchers Say"
- 2002 Northern Ohio Live, "Getting Small"
- Crain's Cleveland Business, "Local Research May Be the Next Line of Defense"
- Science, "Can Sensors Make a Home in the Body"
- 2003 Preclinica, "BioMEMS Comes to Life"
- 2003 NBC Wall Street Journal Report, "2003 Top Innovators"
- Nanobiotech News, "BioMEMS Applications Move from Concept to Reality"
- Technology Review, "Biotech + Medicine: The Convergence of Biology with Computing and Nanotechnology is Yielding Safer and More Effective Medicines"
- 2004 R&D Magazine, "Medical Applications Adopt MEMS Technology"
- MD News, "Nanomedicine at The Cleveland Clinic: Exploring the Big Potential of Tiny Technology"
- WDOK FM 104.1, "Nanotechnology"
- The Plain Dealer, "Tiny Science Expects to Reap Big Advances: Putting Heads Together on a Molecular Level"
- WCPN FM 90.3 (NPR), "Small Technology with a Big Impact"

- 2005 PBS Newshour with Jim Lehrer, "Women in Science"
Crain's Cleveland Business, "Startup Senses a Need for Orthopedic Detection Device"
Orthopedics This Week, "OrthoMEMS-NASA and Cleveland Clinic Team Up for Space Age Orthopedic Implants"
- 2006 Crain's Cleveland Business, "Summit to Bring Together Physicians, Engineers"
Technology Review (online), "Dialysis Unplugged: Will nano-engineered implants set kidney patients free?"
WCPN FM 90.3 (NPR), "Nanotechnology Brings Big Change"
MPMD: Materials and Processes for Medical Devices, "Biomedical Microdevices at the Cleveland Clinic"
- 2007 Los Angeles Times, "Kidney dialysis on the go"
- 2010 PBS Newshour, "For Scientists, Collaborative Efforts Could Speed Medical Advances"
Discover Magazine, "Researchers Plan to Build the World's First Implantable, Mechanical Kidney"
ABC 7 News, "Artificial kidneys may replace dialysis treatments"
KTVU TV Channel 2 News, "Scientists Unveil Revolutionary Artificial Kidney"
CNET.com, "Are the days of kidney dialysis numbered?"
Popular Science - Online, "Researchers Announce First Implantable Artificial Kidney Prototype"
UCSF News, "UCSF Unveils Model for Implantable Artificial Kidney to Replace Dialysis"
UCSF School of Pharmacy News, "Roy unveils model of bioartificial kidney"
KQED Quest, "Scientists Work on New Artificial Kidney"
UCSF School of Pharmacy News, "Animation shows bioartificial kidney in action"
San Francisco Chronicle, "UCSF team working on artificial kidney"
KQED Forum, "Building Artificial Kidneys"
UCSF School of Pharmacy News, "Shuvo Roy shares promise of bioartificial kidney"
SmartPlanet, "Implantable artificial kidney may cure chronic kidney disease"

- 2011 UCSF School of Pharmacy News, "Bioartificial Kidney addition wins LEGO robot design awards"
- UCSF News, "New Kidney Filtration System Could Simplify Dialysis"
- UCSF School of Pharmacy News, "Shuvo Roy presents new research on artificial kidney membranes"
- UCSF School of Pharmacy News, "In-flight programming features bioartificial kidney"
- 2012 Medgadget, "An Implantable Artificial Kidney: Interview with UCSF's Dr. Shuvo Roy"
- Co.Exist, Fast Company, "An Artificial Kidney to take patients off the transplant waiting list"
- UCSF News, "UCSF Artificial Kidney Project tapped for accelerated FDA program"
- FDA, "FDA announces plans to pilot end-stage kidney disease technology in new program"
- UCSF School of Pharmacy News, "Artificial Kidney project led by Shuvo Roy chosen for accelerated FDA program"
- UCSF School of Pharmacy News, "Artificial Kidney project led by Shuvo Roy cited at White House panel"
- ABC 7 News, "FDA may soon approve UCSF kidney device"
- UCSF News, "Health Care Game Changers to Address Dreamforce Conference"
- UCSF News, "Artificial Kidney Project at UCSF Receives \$3 Million in New Funding"
- Science Business, "Artificial Kidney Project Lands New \$750,000 Funding"
- San Francisco Business Times, "UCSF nabs \$3 million to lead artificial kidney effort"
- Renal Business, "UCSF Artificial Kidney Project Receives \$3 Million in New Funding"
- Medgadget, "Artificial Organ Waiting List... Coming Soon to a Hospital Near You"
- Renal and Urology News, "Implantable Artificial Kidney Could Help Tens of Thousands: An Interview with Shuvo Roy, PhD"
- 2013 Fast Company, "How to Build a Real \$1 Million Bionic Man"
- San Francisco Chronicle, "Kidney Designers Take Cues

from Nature"

SF Gate, "Artificial Kidney - Photo Gallery"

The Denver Post, "Artificial Kidney Offers Hope to Patients Tethered to a Dialysis Machine"

San Jose Mercury News, "Artificial Kidney Offers Hope to Patients Tethered to a Dialysis Machine"

The Economist, "A Better Waterworks"

The Telegraph, "Want A Kidney?"

TIME, "Artificial and Implantable Organs"

Smithsonian Channel, "The Incredible Bionic Man"

South China Morning Post "Smithsonian's bionic man has artificial heart and prototype parts"

2014 National Institutes of Health: Biomedical Imaging and Bioengineering, "New Bionic Man Education Tool"

Kidney Buzz, "Artificial Kidney Holds Promise for those Afflicted with ESRD"

The New York Times, "Inside the World of Kidney Trafficking" Letter to the Editor

2015 Omics International, "Bio-Implantable Artificial Kidney Device - A breakthrough by Indian Researcher"

The Business Journals, "Bio-Artificial Kidney Project Hoping to Raise Funds Through Social Media Crowdfunding Effort"

Yahoo! Finance, "Bio-Artificial Kidney Project Hoping to Raise Funds Through Social Media Crowdfunding Effort"

KSL Broadcasting News, "Artificial Kidney will save millions of lives, scientists say"

Tennessean, "Time to invest in kidney disease research is now"

REGIONAL AND OTHER INVITED PRESENTATIONS

2009 UC San Francisco/UC Berkeley Joint Graduate Program in Bioengineering, Annual Retreat, San Francisco, CA (invited talk)

2010 UC San Francisco Bioengineering and Therapeutic Sciences Symposium, San Francisco, CA (invited talk)

2010 UC Berkeley, Nanoscience and Nanoengineering Institute Seminar, Berkeley, CA (invited speaker)

2010 UC Berkeley, Department of Bioengineering Seminar, Berkeley, CA (invited talk)

- 2010 MedTech Frontiers seminar at Triple Ring, Newark, CA (invited presentation)
- 2011 UC Berkeley and UC San Francisco, Department of Bioengineering Seminar, Berkeley, CA (invited talk)
- 2011 National Kidney Foundation, Spring Clinical Meeting Symposium, Las Vegas, NV (invited talk)
- 2011 Berkeley Sensor and Actuator Center, Seminar Series, Berkeley, CA (invited talk)
- 2012 UC Berkeley Nano Seminar Series, Nanoengineering an Artificial Kidney, Berkeley, CA (invited talk)
- 2012 UC San Francisco School of Medicine, Transplant Seminar Series, San Francisco, CA (invited presentation)
- 2012 Mt. Union College, Featured Alumni Fireside Chat, Mt. Union, OH (invited guest)
- 2013 Bioengineering and Therapeutic Sciences Faculty Lunch Lecture - Implantable Renal Assist Device (iRAD), San Francisco, CA (Invited talk)
- 2013 UC San Francisco Surgery Grand Rounds - Implantable Artificial Kidney for End Stage Renal Disease Therapy, San Francisco, CA (Invited talk)
- 2013 Bay Area Bio2Device Group - The Implantable Bioartificial Kidney, Palo Alto, CA (Invited talk)
- 2013 CIRM Seminar - Implantable Bioartificial Kidney, San Francisco, CA (Invited talk)
- 2013 UC San Francisco Faculty Associates Intercampus Meeting - The Kidney Project: Implantable Bioartificial Kidney for End Stage Renal Disease (ESRD), San Francisco, CA (Invited talk)
- 2013 UC San Francisco RMS Staff - The Kidney Project: Implantable Bioartificial Kidney for End Stage Renal Disease (ESRD), San Francisco, CA (Invited talk)
- 2013 University Club of San Francisco - The Kidney Project: Implantable Bioartificial Kidney for End Stage Renal Disease (ESRD), San Francisco, CA (Invited talk)
- 2014 Stanford University School of Medicine, Nephrology Grand Rounds - Implantable Artificial Kidney: Promise and Progress, Palo Alto, CA (Invited Talk)
- 2014 UC San Francisco - Urology Grand Rounds, San Francisco, CA (Invited Talk)
- 2014 UC San Francisco Controller's Office - The Kidney Project: Implantable Bioartificial Kidney for End Stage Renal Disease (ESRD), San Francisco, CA (Invited Talk)
- 2014 National Kidney Foundation (NKF) 46th Annual Bay Area

- Medical Symposium - The Implantable Artificial Kidney: The Promise and Progress, San Francisco, CA (Invited Talk)
- 2015 Santa Clara University, Bioengineering Seminar Series - Implantable Artificial Kidney, Santa Clara, CA (Invited Talk)
- 2015 UCSF/UCB BioE JGGB Prospective Student Visit Day - Implantable Bioartificial Kidney, San Francisco, CA (Invited Talk)

GOVERNMENT AND OTHER PROFESSIONAL SERVICE

- | | | |
|----------------|---|-----------------------|
| 2001 - 2001 | US Civilian Research and Development Fund | Grant Reviews |
| 2001 - 2004 | NIH/NCRR | Study Section |
| 2002 - present | Glennan Microsystems, Inc. | Board Member |
| 2003 - present | NIH/NIBIB | Study Section |
| 2003 - present | National Science Foundation | Grant Reviews |
| 2004 - 2004 | Siemens Westinghouse Competition | National Finals Judge |
| 2013 - present | Engineering Advisory Board, University of Mount Union | Board Member |
| 2013 - present | Qatar National Research Fund | Grant Reviews |
| 2014 - present | XPrize Foundation | Participant |
| 2013 - present | University of Mount Union Engineering Advisory Board | Board Member |

UNIVERSITY AND PUBLIC SERVICE

UNIVERSITY SERVICE

UC SYSTEM-WIDE

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|-------------|--|-----------------------------|
| 2012 - 2012 | University of California Representation in US Congress -- UC in DC | UCSF Faculty Representative |
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UCSF CAMPUS-WIDE

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|----------------|---|-----------------------------|
| 2009 - 2013 | Joint Graduate Group in Bioengineering | Executive Committee: Member |
| 2009 - present | Graduate Program in Pharmaceutical Sciences and Pharmacogenomics Admissions Committee | Member |
| 2009 - present | Joint Graduate Group in Bioengineering Admissions Committee | Member |
| 2010 - present | Masters in Translational Medicine Program Executive Committee | Member |

2010 - present	Masters in Translational Medicine Program Admissions Committee	Member
2011 - present	Academic Senate Committee on Faculty Welfare	Member
2012 - present	Medical Scientist Training Program (MSTP) Council	Member
2012 - 2013	Joint Graduate Group in Bioengineering	Executive Committee: Co-Chair
2013 - present	Chancellor's Council	Member
2014 - present	Masters in Translational Medicine Program	Faculty Director, Academic Advisor
2014 - present	Academic Senate Distinction in Mentoring	Awards Selection Committee Member
2015 - present	Eugene Cota-Robles Fellowship	Selection Committee
2015 - present	UCSF Clinical and Translational Science Institute (CTSI) Resource Allocation Program (RAP) - Digital Health Committee	Reviewer
2015 - present	Masters in Translational Medicine Program	Capstone Director
2015 - present	Innovation Partners Group	Member
2015 - present	Chancellor's Technology Advisory Group (TAG)	Participant

SCHOOL OF MEDICINE

2012 - present	Department of Surgery - Surgical Innovations	Committee Member
2014 - present	Department of Surgery - Surgical Innovations	Engineering Lead

SCHOOL OF PHARMACY

2009 - 2013	School of Pharmacy, Faculty Council	Member
2012 - 2013	Student Conduct Task Force	Chair
2013 - 2013	School of Pharmacy, Faculty Council	Chair
2014 - present	Dean's Innovation in Education Award Committee	Member

DEPARTMENTAL SERVICE

2009 - 2010	Faculty Search Committee	Member
2015 - 2015	Bioengineering and Therapeutic Sciences Faculty Retreat	Bioengineering Discussion Group Leader

SUMMARY OF SERVICE ACTIVITIES

I am heavily involved in departmental and university service and view it as a deeply important and enjoyable part of my commitment to UCSF. I was Co-Chair and Executive Committee member of the UCSF/UC Berkeley Joint Graduate Group in Bioengineering (JGGB) Program for 4 years. The program comprises over 180 students and almost 100 faculty members. I am also Faculty Director, Capstone Director, Head Academic Advisor and an Executive Committee member for the nascent UCSF/UC Berkeley Master of Translational Medicine Program (MTM). In

this position, I participate in overall administration, including student admissions, curriculum development, capstone project selection, and student mentoring. At the departmental level, I have served on a successful faculty search committee to recruit microfluidics expertise to the department. In addition, I was the Chair of the School of Pharmacy Faculty Council and prior to this position I headed its Student Misconduct Taskforce that was drafting a policy on academic misconduct.

At the university level, I serve on the MSTP faculty council and the Faculty Welfare Committee. I am also a member of the Department of Surgery Innovations Committee, where I provide input on strategies to facilitate surgical innovation and translation of new technologies and devices to clinical use. In addition, I work closely with CTSI and the Office of Innovation, Technology, and Alliances to provide input and advice on medical device commercialization, industry interactions, and translational activities at UCSF. I am currently advising over 20 students and fellows outside of my lab, and have sat on over 40 qualifying exams and served on either the dissertation committee or as thesis advisor for 60 pre-doctoral students.

Outside of the university, I am active in the scientific and engineering communities organizing and chairing many sessions at a range of conferences including the inaugural NanoMedicine Summit at the Cleveland Clinic, NCI Cancer Nanotechnology Symposium, Materials for Medical Devices, and ASME Summer Bioengineering Conference. I am Associate Editor of Biomedical Microdevices and on the editorial board of Sensors & Materials, Journal of Biosensors and Bioelectronics, and Medical Instrumentation. I have served on numerous study sections at NIH and NSF as well as international entities including the Qatar Government and European research foundations.

TEACHING AND MENTORING

TEACHING

FORMAL SCHEDULED CLASSES FOR UCSF STUDENTS

Qtr	Academic Yr	Course Number and Title	Teaching Contribution	Units	Class Size
Spr	2010 - 2010	BPS 113 - Drug Delivery Systems	Lecturer	2	40
Win	2011 - 2011	BIOE 297 - Principles of Medical Device Innovation	Course Director and Instructor	2	22
Spr	2011 - 2011	BPS 113 - Drug Delivery: From Biologics to Devices	Lecturer	3	40
Win	2012 - 2012	BIOE 297 - Principles of Medical Device Innovation	Course Director and Instructor	2	20
Spr	2012 - 2012	BPS 113 - Drug Delivery: From Biologics to Devices	Lecturer	3	40
Win	2013 - 2013	BIOE 270 - Translational Challenges: Diagnostics, Devices, and Therapeutics	Course Director and Instructor	2	20
Spr	2013 - 2013	BPS 113 - Drug Delivery: From Biologics to Devices	Lecturer	3	40
Win	2014 - 2014	BIOE 270 - Translational Challenges: Diagnostics, Devices, and Therapeutics	Course Director and Instructor	2	22
Spr	2014 - 2014	BPS 113 - Drug Delivery: From Biologics to Devices	Lecturer	3	40
Win	2015 - 2015	BIOE 270 - Translational Challenges:	Course Director	2	30

Qtr	Academic Yr	Course Number and Title	Teaching Contribution	Units	Class Size
		Diagnostics, Devices, and Therapeutics	and Instructor		
Spr	2015 - 2015	BPS 113 - Drug Delivery: From Biologics to Devices	Lecturer	3	40
Fall/ Win/ Spr	2015 - 2016	BIOE 296 - MTM Capstone Course	UCSF Capstone Director	3	30
Win	2016 - 2016	BIOE 270 - Translational Challenges: Diagnostics, Devices, and Therapeutics	Course Director and Instructor	2	30
Spr	2016 - 2016	BPS 113 - Drug Delivery: From Biologics to Devices	Lecturer	3	40

POSTGRADUATE AND OTHER COURSES

2010 - 2010	School of Medicine, Introduction to Human Biology and Medicine - Graduate Education in Medical Science (GEMS) Training Program	Guest Lecturer
2010 - 2010	Nephrology Mini Course	Instructor

TEACHING NARRATIVE

Teaching is an important part of the overall work that I do at UCSF. In 2010, I designed and taught a new 2-unit course during the Winter 2011 term, BioE 297: Principles of Medical Device Innovation. The course was received positively and was offered again in Winter 2012 as a special topics course. In 2013, the course was instated as a permanent course, BioE 270: Translational Challenges: Diagnostics, Devices, and Therapeutics, as part of the Masters in Translational Medicine (MTM) curriculum. The course combines lectures from scientists, practitioners, and industry professionals and introduces key concepts of the medical devices product development process. It was offered in subsequent Winter terms and integrates Google groups and the UCSF CLE platforms for engagement. In addition to this course, I am the current Capstone Director and advisor on the development of other key courses within the MTM curriculum including the Healthcare Economics course and feasibility of a new drug-development track. Finally, I participated in the redesign and teaching of BPS 113, which commenced with first year UCSF clinical pharmacy students in Spring 2010.

While at Case Western Reserve University and Cleveland State University, both of which are located near the Cleveland Clinic, I designed and taught a semester-long course on biomedical applications of MEMS for advanced undergraduate and graduate students. Typically, 10-15 students enrolled from various engineering departments, and with varying levels of background knowledge of MEMS. Therefore, I sectioned the course into three components - review of fundamental technologies, analysis of prototype bioMEMS devices, and a term paper project. I used a mixed model of problem based learning (PBL) and traditional instruction to achieve a balance between transmission of formal knowledge and development of core skills such as inquiry, problem solving, and collaboration.

I have also designed and taught short courses ranging from half-day to 4 days in conjunction with professional societies and corporate continuing education offices. These courses are customized to the audience backgrounds and needs. Typically, the courses have been targeted to either practicing engineers interested in learning about challenges that must be overcome for successful medical device development, or clinicians interested in developing MEMS solutions to existing medical problems. For both groups, I offered an overview of state-of-the-art in MEMS technology, and then engaged the attendees through interactive discussions on specific problems that overlap with their interests and background.

MENTORING

PREDOCTORAL STUDENTS SUPERVISED OR MENTORED

Dates	Name	Program or School	Role	Current Position
2003 - 2003	Paul Bixenstine	Shaker Heights High School, high school student	Co-supervised laboratory work on ultrasound transducer	Medical Student, Johns Hopkins University
2002 - 2005	Charlie Blaha	Dennison University, University of Toledo, undergraduate student	Supervised undergraduate research projects on spine biomechanics and tissue engineering scaffolds	Project Director, Silicon Kidney, San Francisco
2006 - 2006	Grant Cathcart	Shaker Heights High School, high school student	Co-supervised summer work on ultrasound transducers	US DoD
2003 - 2008	Chaitanya Chandrana	Cleveland State University, graduate student	Doctoral advisor on ultrasound transducers	Los Alamos National Lab, New Mexico
1999 - 1999	Christine Chevalier	University of Dayton, undergraduate student	Supervised undergraduate research project on blood coagulation sensor	Engineer - Analex Corporation
2003 - 2006	Maddy Coquillette	Hathaway Brown School, high school student	Supervised research project on spine biomechanics	Resident Physician at Boston Children's Hospital
2006 - 2007	Abby (Eldridge) Koppes	Rensselaer Polytechnic Institute, undergraduate student	Supervised undergraduate research project on surface modification	Assistant Professor at Northeastern University, Department of Chemical Engineering
2001 - 2008	Lisa Ferrara	Cleveland State University, graduate student	Doctoral advisor on spine biomechanics	Founder and CEO - OrthoKinetic Technologies, LLC
2005 - 2005	Levi Frolich	Fuchs Mizrahi School, high school student	Co-supervised summer work on ultrasound transducers	Teaching Assistant - Technion International School of Engineering

Dates	Name	Program or School	Role	Current Position
2004 - 2004	Aseem Garg	St. Edward High School, high school student	Supervised summer work on bioMEMS	Undergraduate Student - Washington University in St. Louis
2004 - 2005	Morgan Grossman-Mckee	Shaker Heights High School, high school student	Supervised research project on cell growth kinetics	Analyst at Barclays Investment
2002 - 2002	Matthew Immerman	Shaker Heights High School, high school student	Co-supervised summer work on bioMEMS	Communication Analyst, San Francisco
2004 - 2007	Eun Jung Kim	Cleveland State University, graduate student	Doctoral advisor on tissue engineering scaffolds	Postdoctoral Fellow - University of California, San Francisco
2007 - 2007	Laney Kuenzel	Hathaway Brown School, high school student	Supervised research project on drug delivery microneedles	Software Engineer at Facebook
2002 - 2003	Jeff Magistrelli	Case Western Reserve University, graduate student	Master's thesis advisor on membrane transport characterization	Engineer - Firestone Polymers
2001 - 2001	Emily Marcinkevicius	Hathaway Brown School, high school student	Supervised research project on bioMEMS	Postdoctoral Scientist at Columbia University Medical Center
2001 - 2005	Alvaro Mata	Cleveland State University, graduate student	Doctoral advisor on tissue engineering scaffolds	Reader in Biomedical Engineering and Biomaterials, Queen Mary, University of London
2001 - 2002	Rushabh Modi	Case Western Reserve University, graduate student	Master's thesis advisor on ultrasound transducers	Staff Scientist/Engineer - Siemens Medical
2002 - 2008	Pulak Nath	Cleveland State University, graduate student	Doctoral advisor on microfluidic biochip system	Postdoctoral Fellow - Los Alamos National Laboratory
2006 - 2006	Steve Pennybaker	Newbury High School, high school student	Supervised summer work on drug delivery microneedles	Student - Massachusetts Institute of Technology
2002 - 2004	Rachel Rosenblum	Case Western Reserve University, graduate student	Master's project advisor on membrane fabrication process	Beacon Partners
1999 - 2000	Christina Saikus	Hathaway Brown School, high school student	Co-supervised laboratory work on bioMEMS	Cardiothoracic Surgery Resident, Emory University School of Medicine
2005 - 2005	Dustin Schroeder	Bucknell University, undergraduate student	Supervised undergraduate research project on cell growth kinetics	Radar Geophysicist and Systems Engineer at Jet Propulsion Laboratory, Pasadena, California

Dates	Name	Program or School	Role	Current Position
2004 - 2007	Ross Smith	Case Western Reserve University, graduate student	Master's thesis advisor on membrane transport characterization	Computational Scientist, Dynamics Research Corporation
2001 - 2003	Elena Udovina	Hathaway Brown University, high school student	Supervised research project on membrane characterization	Postdoctoral Researcher at University of Michigan Department of Statistics
2003 - 2003	Mike Vanderboom	Cleveland Clinic	Supervised summer work on bioMEMS	Grants & Contracts Analyst at Medical College of Wisconsin
2002 - 2002	Emiko Vaughn	Beaumont School, high school student	Supervised research project on surface modification	Accountant - OsAir/Great Plains Exploration, LLC
2005 - 2005	Teal Wurm	University of Cincinnati, undergraduate student	Co-supervised undergraduate research project on ultrasound transducers	Graduate Student - University of Minnesota
2007 - 2011	Kimberly Kam	University of California, San Francisco and Berkeley	Qualifying Exam Committee Member	Associate Scientist at Genentech
2008 - 2011	James Pinney	University of California, San Francisco, Graduate Student	Qualifying Exam Committee Member	Medical Student at University of California, San Francisco
2008 - 2011	Daniel Cohen	University of California, San Francisco and Berkeley, Graduate Student	Qualifying Exam Committee Member	Bioengineering Post-Doc at Stanford University
2008 - 2010	Debkishore Mitra	University of California, Berkeley and San Francisco, Graduate Student	Qualifying Exam Committee Member	Co-Founder of Diassess, Inc.
2009 - 2009	Lalitha Muthusubramaniam	University of California, San Francisco, graduate student	Supervised summer rotation project	Senior Single Cell Applications Engineer at Berkeley Lights, Inc.
2009 - 2009	Rohit Nalamasu	University of California, San Diego, undergraduate student	Supervised summer internship	Undergraduate Student - University of California, San Diego
2009 - 2013	Mozziyar Etemadi	University of California, San Francisco, MD/PhD Student	Supervise research and Dissertation Committee Chair	Medical Student - University of California, San Francisco
2009 - 2009	Jonathan Sockolosky	University of California, San	Supervised research rotation	Postdoctoral Fellow - Stanford University

Dates	Name	Program or School	Role	Current Position
		Francisco, graduate student		
2009 - 2011	Augusto Tentori	University of California, San Francisco, graduate student	Graduate Student Advisor	Graduate Student - University of California, San Francisco
2009 - 2015	Erh-Chia Yeh	University of California, San Francisco, graduate student	Graduate Student Advisor	Graduate Student - University of California, San Francisco
2010 - 2011	Neel Shah	University of California, Berkeley, graduate student	Supervised graduate research	Senior Engineer, HERE.com
2010 - present	Torin Yeager	University of California, San Francisco, graduate student	Supervise research and Dissertation Committee Chair	Graduate Student - University of California, San Francisco
2010 - 2014	Peter Soler	University of California, Berkeley, graduate student	Supervise research	Research Investigator I at Bristol-Myers Squibb
2010 - 2012	Vincent Liu	University of California, Berkeley, undergraduate student	Supervised Undergraduate Research	Test Methods Engineer at Medtronic.
2010 - 2011	Jaskaran Gill	Masters in Translational Medicine (MTM), University of California, Berkeley and San Francisco	Collaborator and Supervisor	Design Engineer at Theranova, LLC
2010 - 2011	Kathleen Koch	Masters in Translational Medicine Program (MTM), University of California, Berkeley and San Francisco	Collaborator and Supervisor	Manager of Clinical and Regulatory Affairs at Channel Medsystems
2010 - 2011	David Lari	Masters in Translational Medicine Program (MTM), University of California, Berkeley and San Francisco	Collaborator and Supervisor	Development Engineer at Transcend Medical
2010 - 2011	Philip Chung	Masters in Translational Medicine Program (MTM), University of California, Berkeley and San Francisco	Collaborator and Supervisor	Junior Specialist at UCSF Biodesign Laboratory
2010 - 2011	Sungwon Lim	Masters in Translational Medicine Program (MTM), University of California, Berkeley	Collaborator and Supervisor	PhD Candidate in Bioengineering at Stanford University

Dates	Name	Program or School	Role	Current Position
		and San Francisco		
2011 - present	Zohora Iqbal	University of California, San Francisco, graduate student	Supervise research and Dissertation Committee Chair	University of California, San Francisco, graduate student
2011 - 2015	Clarence Chow	University of California, San Francisco	Supervise volunteer term	Research Affiliate at University of California, San Francisco
2011 - 2012	Curtis Caton	Masters in Translational Medicine Program (MTM), University of California, Berkeley and San Francisco	Collaborator	Catheter Engineer at Hansen Medical
2011 - 2012	Scott Goodfriend	Masters in Translational Medicine Program (MTM), University of California, Berkeley and San Francisco	Collaborator	Mobile Engineer at Pocket Gems
2011 - 2012	Jason Ni	Masters in Translational Medicine Program (MTM), University of California, Berkeley and San Francisco	Collaborator	Medical Student at University of California, Los Angeles.
2011 - 2012	Joyce Bao	Masters in Translational Medicine Program (MTM), University of California, Berkeley and San Francisco	Project Leader	Siemens Graduate Program at Siemens Healthcare
2011 - 2012	Tiffany Ko	Masters in Translational Medicine Program (MTM), University of California, Berkeley and San Francisco	Project Leader	Doctoral Student at University of Pennsylvania
2011 - 2012	Kevin Lance	University of California, San Francisco, Graduate Student	Qualifying Exam Committee Member	University of California, San Francisco Graduate Student
2011 - 2012	Phin Peng Lee	University of California, San Francisco, Graduate Student	Qualifying Exam Committee Member	University of California, San Francisco, Graduate Student
2012 - present	Aishwarya Jayagopal	University of California, San Francisco, graduate student	Supervise research	University of California, San Francisco, graduate student
2012 - 2013	James Alexander Heller	University of California, San Francisco, graduate	Supervise research	Junior Specialist at University of California, San Francisco, BioDesign

Dates	Name	Program or School	Role	Current Position
		student		Laboratory
2012 - present	Shang Song	University of California, San Francisco, graduate student	Supervise research & Dissertation Committee Chair	University of California, Berkeley, graduate student
2012 - 2012	Gabrielle Cahill	University of California, San Diego, undergraduate	Supervised Undergraduate Research	University of California, San Diego, undergraduate
2012 - 2012	Holden Leslie-Bole	High school student	Supervised summer volunteer term	Undergraduate Student - Yale University
2012 - 2012	Jack Hardiman	Whitman College, undergraduate	Supervised Undergraduate Research	Research Assistant at Mango Materials
2012 - 2012	Michael Rose	Arizona State University, undergraduate	Supervised Undergraduate Research	Arizona State University, undergraduate
2012 - 2012	Nan Iyer		Supervised volunteer term	Senior Semiconductor Process Engineer Proteus Digital Health
2012 - 2013	Nisa Kusumo	University of California, Berkeley, undergraduate	Supervised Undergraduate Research	Process Engineering Intern at Abaxis.
2012 - 2013	Jambu Jambulingam	University of California, Berkeley, undergraduate	Supervised Undergraduate Research	Graduate Student - Georgia Institute of Technology
2012 - 2013	Laura Walsh	University of California, San Francisco, Graduate Student	Dissertation Committee Member and Qualifying Exam Committee Member	University of California, San Francisco, Graduate Student
2013 - 2014	Geonyoung Kim	University of California, Berkeley, undergraduate	Supervised Undergraduate Research	University of California, Berkeley, undergraduate
2013 - 2014	Toan Nguyen	University of California, Berkeley, undergraduate	Supervised Undergraduate Research	University of California, Berkeley, undergraduate
2012 - 2015	Monica Kapil	University of California, Berkeley, Graduate Student	Dissertation Committee Member	University of California, Berkeley Graduate Student
2012 - 2013	Brian McRae	Masters in Translational Medicine (MTM) Program, University of California, San Francisco and Berkeley	Project Leader	Operations Rotational Development Program Analyst at Genentech
2012 - 2013	Jerd Phichitkul	Masters in Translational Medicine (MTM) Program, University	Project Collaborator	Management Associate at Velos

Dates	Name	Program or School	Role	Current Position
		of California, San Francisco and Berkeley		
2012 - 2013	Sara Pittenger	Masters in Translational Medicine (MTM) Program, University of California, San Francisco and Berkeley	Project Collaborator	Reproductive Endocrinology and Infertility Fellow at University of California San Francisco
2012 - 2013	Matt Swisher	Masters in Translational Medicine (MTM) Program, University of California, San Francisco and Berkeley	Project Collaborator	Medical Fellow at IDEO
2013 - 2014	Kevin Lessard	Masters in Translational Medicine (MTM) Program, University of California, San Francisco and Berkeley	Project Collaborator	Engineer I at Corium International
2013 - 2014	Stephanie Kwan	Masters in Translational Medicine (MTM) Program, University of California, San Francisco and Berkeley	Project Collaborator	Graduate of MTM Program at University of California, San Francisco and Berkeley
2013 - 2014	Teresa Nguyen	Masters in Translational Medicine (MTM) Program, University of California, San Francisco and Berkeley	Project Collaborator	Product Development Engineer at Potrero Medical
2013 - 2014	Julie Yabu	Masters in Translational Medicine (MTM) Program, University of California, San Francisco and Berkeley	Project Collaborator	Assistant Professor in Transplant Nephrology at Stanford University School of Medicine. Medical Director - Desensitization and Blood Group (ABO) Incompatible Kidney Transplant Program at Stanford University School of Medicine
2013 - 2014	Sachin Rangarajan	Masters in Translational Medicine (MTM) Program, University of California, San	Project Collaborator	Assistant Specialist at University of California, San Francisco

Dates	Name	Program or School	Role	Current Position
		Francisco and Berkeley		
2013 - 2014	Zoe (Evans) Reinsch	Masters in Translational Medicine (MTM) Program, University of California, San Francisco and Berkeley	Project Collaborator	Business Analyst at ZS Associates
2013 - 2014	Michael Hemati	Masters in Translational Medicine (MTM) Program, University of California, San Francisco and Berkeley	Project Collaborator	R&D Engineer at Theranova, LLC.
2014 - 2015	Huzaifa Beg	Masters in Translational Medicine (MTM) Program, University of California, San Francisco and Berkeley	Project Collaborator	Recent graduate of the MTM Program at University of California, San Francisco and Berkeley
2014 - 2015	Danielle Chou	Masters in Translational Medicine (MTM) Program, University of California, San Francisco and Berkeley	Project Collaborator	Reliability Engineer at Proteus Digital Health, Inc.
2014 - 2015	Sita Kumar	Masters in Translational Medicine (MTM) Program, University of California, San Francisco and Berkeley	Project Collaborator	Biomedical Engineer at Shift Labs
2014 - 2015	Rahul Nayak	Masters in Translational Medicine (MTM) Program, University of California, San Francisco and Berkeley	Project Collaborator	Engineering & Quality at a private biomedical device company in Palo Alto, CA
2014 - 2015	Bas Meusen	University of California, San Francisco	Supervised Graduate Research	Biomedical Engineering Graduate Student at Eindhoven University of Technology
2015 - present	Kevin McCandless	Masters in Translational Medicine (MTM) Program, University of California, San Francisco and	Project Collaborator	MTM Graduate Program

Dates	Name	Program or School	Role	Current Position
		Berkeley		
2015 - present	Michael Berry	Masters in Translational Medicine (MTM) Program, University of California, San Francisco and Berkeley	Project Collaborator	MTM Graduate Program
2015 - present	Khushbu Kabra	Masters in Translational Medicine (MTM) Program, University of California, San Francisco and Berkeley	Project Collaborator	MTM Graduate Program
2015 - present	Julia Yang	Biomedical Engineering Society, San Jose State University	Project Mentor	Biomedical Engineering Society, San Jose State University
2015 - present	David Orozco	Biomedical Engineering Society, San Jose State	Project Mentor	Biomedical Engineering Society, San Jose State

POSTDOCTORAL FELLOWS AND RESIDENTS DIRECTLY SUPERVISED OR MENTORED

Dates	Name	Fellow	Faculty Role	Current Position
1998 - 2002	William Fissell, MD	Resident - University Hospitals of Cleveland Nephrology Fellow - University of Michigan	Research Supervision, Career Guidance	Associate Professor Department of Nephrology and Hypertension Vanderbilt University and Medical Center
2005 - 2006	Matt Johnston, PhD	Postdoctoral Fellow - Cleveland Clinic	Research Supervision	Design Assurance QA Engineer CT/NM, Philips
2004 - 2008	Tao Pan, PhD	Research Engineer - Cleveland Clinic	Research Supervision	Staff Research Engineer - Case Western Reserve University
2001 - 2005	Jim Talman, PhD	Research Engineer - Cleveland Clinic	Research Supervision	Patent Examiner - US Patent and Trademark Office
2009 - 2011	Rachel Lowe, PhD	Postdoctoral Fellow	Research Supervision	Max Planck for Biophysical Chemistry
2009 - 2011	Rishi Kant, PhD	Postdoctoral Fellow	Research Supervision	McKinsey and Company
2010 - 2013	Kayvan Keshari, PhD	Postdoctoral Fellow	Research Supervision	Researcher, Memorial Sloan Kettering Cancer Center
2010 - present	Eun Jung Kim, DEng	Postdoctoral Fellow	Research Supervision	Postdoctoral Researcher at University of California, San Francisco

Dates	Name	Fellow	Faculty Role	Current Position
2012 - present	Steven Kim, MD	Postdoctoral Fellow	Research Supervision	Postdoctoral Researcher at University of California, San Francisco
2013 - present	Jae Hyun, PhD	Postdoctoral Fellow	Research Supervision	Postdoctoral Researcher at University of California, San Francisco
2013 - 2014	Elisabeth Leeftang, MD	Postdoctoral Fellow	Research Supervision	CMO at Innovo Sciences, Palo Alto, California
2013 - 2014	Derek Ulvila, MD	Postdoctoral Fellow	Research Supervision	Surgery Resident at University of California, San Francisco
2014 - present	Willieford Moses, MD	Postdoctoral Fellow	Research Supervision	Postdoctoral Researcher at University of California, San Francisco
2014 - present	Benjamin Feinberg, PhD	Postdoctoral Fellow	Research Supervision	Postdoctoral Researcher at University of California, San Francisco
2014 - 2015	Lauren Christine Ritz, MD	Postdoctoral Fellow	Research Supervision	Postdoctoral Researcher at University of California, San Francisco
2014 - present	Ajay Dharia, MD	Postdoctoral Fellow	Research Supervision	Postdoctoral Researcher at University of California, San Francisco
2015 - present	Claire Graves, MD	Postdoctoral Fellow	Research Supervision	Postdoctoral Researcher at University of California, San Francisco
2014 - present	Anupama Arun, MD	Postdoctoral Fellow	Research Supervision	Postdoctoral Researcher at University of California, San Francisco

FACULTY MENTORING

Dates	Name	Position While Mentored	Mentoring Role	Current Position
2003 - 2010	William Fissell, MD	Lecturer (Medicine), Assistant Professor (Medicine) - University of Michigan	Grant Reviews, Research Collaborator	Associate Staff (Nephrology), Director of Renal Nanotechnology Laboratory (Biomedical Engineering) - Cleveland Clinic
2009 - present	Hao Jiang, PhD	Assistant Professor - San Francisco State University	Grant Reviews, Publications, Research Collaborator	Associate Professor - San Francisco State University
1998 - 2010	Aaron Fleischman, PhD	Project Staff, Assistant Staff - Cleveland Clinic	Grant Reviews, Research Collaborator	Project Scientist, Director of BioMEMS Laboratory (Biomedical Engineering) - Cleveland Clinic
2001 - 2004	Raj Shekhar, PhD	Project Staff - Cleveland Clinic	Grant Reviews	Principal Investigator at Children's National Medical Center,

Dates	Name	Position While Mentored	Mentoring Role	Current Position
				Washington DC
2002 - 2005	Geoffrey Vince, PhD	Assistant Staff - Cleveland Clinic	Grant Reviews, Research Collaborator	Chair, Biomedical Engineering Cleveland Clinic
2004 - 2007	Stephen Williams, PhD	Project Staff - Cleveland Clinic	Grant Reviews	President of Cambrian Technologies, Inc., Cleveland, Ohio
2009 - 2014	Paul Brakeman, MD	Assistant Professor, Pediatrics, University of California, San Francisco	Grant Reviews, Research Collaborator	Assistant Professor, Pediatrics, University of California, San Francisco
2013 - 2014	Matthew Guthaus, PhD	Associate Professor, Computer Engineering, University of California, Santa Cruz (on sabbatical)	Sabbatical Supervisor	Associate Professor, Computer Engineering, University of California, Santa Cruz (on sabbatical)

OTHER VISITING FACULTY SUPERVISED

1999 - 1999 Gerry Neudeck, PhD Purdue University

TEACHING AND MENTORING AIDS

Utilize Google groups and UCSF CLE for sharing course materials, updating assignments, sharing information, and creating space for discussions beyond the classroom.

Developed syllabus, lectures, hand-outs, and group website for a semester-long course on biomedical applications of MEMS technology; class was offered twice for advanced undergraduate and graduate students at Case Western Reserve University and Cleveland State University.

Developed syllabus, lecture materials, and hand-outs for class on minimally invasive biomedical MEMS technology, which was part of an annual short course on BioMEMS sponsored by ASME (American Society of Mechanical Engineers); class was adopted for 3 years.

Recruited state-of-the-art practitioners in the medical device industry to participate in Bioe 270 at UCSF. The industry instructors support the course with interactive workshops on “real world” projects designed to key concepts of product development including concept generation, prototyping approaches to demonstrate feasibility, and translation pathways. The class was offered twice, and subsequently the course was adopted as requirement for the UCSF-UCB Masters in Translational Medicine Program.

OTHER

See book chapters, Introduction to MEMS and MEMS and Neurosurgery, which are listed under "Non-Peer Reviewed Publications and Other Creative Activities"; these materials are used by neurosurgery and spine postdoctoral and clinical fellows at the Cleveland Clinic.

Instructor for Corning Future Opportunities Innovation Workshop, which explored potential market introduction and growth opportunities for Corning, Inc.

Clinical Advisor for students from San Jose State University attending the Biomedical Engineering Society (BMES) Coulter College Program.

Instructor for CMP-MIC short course on microfabrication of medical devices, which was attended by semiconductor fabrication engineers with specialization in chemical-mechanical polishing.

TEACHING AND MENTORING AWARDS AND NOMINATIONS

2014 UCSF Outstanding Faculty Mentorship Award, Finalist

SUMMARY OF TEACHING AND MENTORING HOURS

2013 - 2014	360 total hours of teaching (including preparation) Formal class or course teaching hours: 40 hours Informal class or course teaching hours: 200 hours Mentoring hours: 120 hours Other hours:
2014 - 2015	360 total hours of teaching (including preparation) Formal class or course teaching hours: 40 hours Informal class or course teaching hours: 200 hours Mentoring hours: 120 hours
2015 - 2016	Total anticipated hours of teaching: 360 hours

RESEARCH AND CREATIVE ACTIVITIES

RESEARCH AWARDS

CURRENT

1R01 EB014315 (PI) NIH Biocompatibility of Implantable Renal Replacement Devices	05/01/2012 - 04/30/2016 \$510,757 direct/yr1 \$1,758,099 total
NSF 00008008 (PI) University of California, Berkeley Prime Flexible Resorbable Organic and Nanomaterial Therapeutic Systems	08/15/2012 - 07/31/2016 \$137,056 direct/yr1 \$800,000 total
1R01EB012031-01A1 (Co-I) NIH/NIBIB Endovascular Magnetic Catheter for Interventional MRI	08/01/2011 - 05/31/2016 \$374,523 direct/yr1
(Subawardee PI) DTRA, LANL (UCSF subaward) Integration of Novel Technologies for Organ Development and Rapid Assessment of Medical Countermeasures (INTO-RAM)	03/11/2013 - 12/31/2017 \$139,020 direct/yr1 \$1,130,000 total
1 P50 FD003793-04 (Co-PI) Food and Drug Administration Pediatric Device Consortium Grant Program UCSF Pediatric Device Consortium	09/01/2011 - 08/31/2016 \$136,364 direct/yr1 \$1,000,000 total
P50AR0060752 (Co-I) NIH/NIAMS Translation of Quantitative Imaging in Osteoarthritis	08/01/2011 - 07/31/2016 \$1,031,589 direct/yr1
(Co-I) Gates Foundation A "Smart Diaphragm" for the Early Detection of Preterm Labor	11/13/2013 - 10/31/2016 \$515,884 direct/yr1 \$2,700,000 total
1U01 FD004979-01 (Other Significant Contributor) NIH/FDA UCSF-Stanford Center of Excellence in Regulatory Sciences and Innovation	04/15/2014 - 03/31/2017 \$1,100,000 direct/yr1

(PI) JDRF Encapsulation Consortium Developing and Testing Novel Encapsulation Technologies	08/01/2015 - 07/31/2018 \$350,000 direct/yr1 \$1,000,000 total
1R01CA194533 (Co-I) NIH/NCI Endovascular Chemofiltratio	06/01/2015 - 05/31/2016 \$489,326 direct/yr1
<u>PENDING</u>	
1U01EB021214 (PI) NIH/NIBIB Building an Implantable Artificial Kidney	12/01/2015 - 11/30/2019 \$1,000,000 direct/yr1 \$6,300,000 total
R01EB022219 (PI) NIH Bioreactor Development for Renal Replacement Devices	04/01/2016 - 03/31/2020 \$499,999 direct/yr1
<u>PAST</u>	
Cleveland Advanced Manufacturing Program, () Microfabricated Filters and Cutting Tools	01/01/1999 - 06/20/1999 \$17,000 direct/yr1 \$17,000 total
R43 HL062733 (Co-I) NIH/SBIR-Phase I Miniature, Implantable Fiber-Optic Pressure Sensor	05/15/1999 - 11/30/2000 \$22,150 direct/yr1 \$22,150 total
(Co-PI) NASA Micromachined Ultrasonic Transducers For Minimally Invasive Imaging	07/01/1999 - 06/30/2003 \$98,490 direct/yr1 \$393,960 total
(Co-PI) NASA Miniature Drug Delivery Systems for Minimally Invasive Therapy	07/01/1999 - 06/30/2003 \$96,141 direct/yr1 \$384,564 total
(Co-PI) Ohio Board of Regents Ohio MicroMD: The Ohio BioMEMS Consortium on Medical Therapeutic Devices	08/15/1999 - 06/30/2000 \$243,000 direct/yr1 \$243,000 total

(PI) iMEDD, Inc. Fabrication of Nanomembranes	07/01/2000 - 12/31/2000 \$10,340 direct/yr1 \$10,340 total
(Consultant Co-PI) Whitaker Foundation Micromachined Biocapsule Membranes	07/15/2000 - 12/31/2000 \$15,833 direct/yr1 \$15,833 total
BAA 00-011 SymBioSys (Co-PI) DARPA Experimental and Theoretical Development of Bio-Fluid Transport Models through Nano- and Micro-fluidic Components	09/01/2000 - 06/30/2002 \$186,002 direct/yr1 \$325,503 total
(Co-PI) NASA Evaluation of MEMS Materials of Construction for Implantable Medical Applications	10/01/2000 - 09/30/2002 \$33,507 direct/yr1 \$67,114 total
01-060 (PI) Ohio Third Frontier Action Fund MEMS Technology Platform for Implantable Medical Applications	07/01/2001 - 06/30/2004 \$369,930 direct/yr1 \$739,860 total
R01 HL 069094 (Co-I) NIH/NHLBI High Frequency Nonlinear Acoustic Intravascular Imaging	01/01/2002 - 12/31/2007 \$499,000 direct/yr1 \$2,494,583 total
(PI) NASA Controlled-Release Microsystems for Pharmacological Agent Delivery	05/01/2002 - 04/30/2005 \$168,313 direct/yr1 \$477,689 total
(PI) Rockefeller Brothers Fund Growth of Connective Tissue Progenitor Cells on Micro- Textured Surfaces for Enhanced Bone Tissue Engineering	01/01/2003 - 09/30/2003 \$23,150 direct/yr1 \$23,150 total
R43 HL 074652 (Co-I) NIH/SBIR-Phase I Ultrasonic Microtransducer for Intravascular Imaging	09/01/2003 - 08/31/2004 \$21,568 direct/yr1 \$21,568 total
R21 EB 003272 (PI) NIH/NIBIB	09/12/2003 - 08/31/2006 \$150,000 direct/yr1

Microneedle Array for Catheter Drug Delivery	\$275,000 total
R21 EB 002285 (Co-I)	09/30/2003 - 05/31/2006
NIH/NIBIB	\$50,000 direct/yr1
BioMEMS Materials for Renal Tissue Engineering	\$100,000 total
W81XWH-04-1-0520 (Co-PI)	05/18/2004 - 06/30/2008
DoD/USAMRMC	\$378,830 direct/yr1
Portable Biochip for Rapid Detection of Biowarfare Agents	\$1,086,835 total
(PI)	05/01/2005 - 12/31/2007
OrthoMEMS, LLC	\$13,000 direct/yr1
Wireless Pressure Sensor Demonstration	\$43,846 total
(Co-I)	07/01/2005 - 06/30/2008
Ohio BRTT Partnership	\$1,212,121 direct/yr1
Clinical Tissue Engineering Center (CTEC)	\$3,636,364 total
(PI)	08/01/2005 - 06/30/2007
NASA	\$62,405 direct/yr1
High Resolution Portable Ultrasonic Imaging System	\$124,810 total
R43 NS 052939 (Co-I)	09/15/2005 - 06/30/2008
NIH/NINDS	\$25,000 direct/yr1
Ambulatory System for Hydrocephalus Shunt Monitoring	\$49,460 total
W81XWH-05-2-0010 (Co-PI)	06/01/2006 - 08/31/2010
DoD/USAMRMC	\$50,000 direct/yr1
Nanofabricated Bioartificial Kidney	\$250,000 total
R43 HL084775 (Co-I)	09/30/2006 - 03/31/2008
NIH/SBIR-Phase I	\$14,154 direct/yr1
Micromachined Intravascular Ultrasound Transducer	\$14,154 total
0750159 (Co-I)	01/01/2007 - 06/30/2007
NSF/SBIR-Phase I	\$21,227 direct/yr1
Intravascular Drug Delivery using Microneedle Arrays	\$21,227 total
0750218 (Co-I)	01/01/2007 - 06/30/2007

NSF/SBIR-Phase I	\$19,785 direct/yr1
Wireless Sensor for In Vivo Wireless Pressure Measurement	\$19,785 total
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NNC07QA84A84P-1A (PI)	01/01/2007 - 12/31/2007
NASA/STTR-Phase I	\$24,501 direct/yr1
Nanoporous Membrane for Medical Grade Water Generation	\$24,501 total
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R01 EB008049 (PI)	09/30/2007 - 08/31/2011
NIH/NIBIB	\$871,806 direct/yr1
	\$2,599,296 total
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1 P50 FD003793-01 ((Co-I))	09/25/2009 - 01/31/2012
Food & Drug Administration Pediatric Device Consortia Grant Program	\$346,550 direct/yr1
UCSF Pediatric Device Consortium	\$1,000,000 total
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Translational Technology Development Award (PI)	02/01/2011 - 06/30/2012
UCSF Clinical and Translational Science Institute	\$12,360 direct/yr1
Reconstruct of vertebral endplate using biomedical microelectromechanical systems (bioMEMS) and microfabrication related technologies MEMS and nanotechnology	\$30,000 total
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W81XWH-05-2-0010 (Co-I)	09/01/2008 - 08/31/2012
Innovative Biotherapies [Subcontract]	\$9,709 direct/yr1
Nanofabricated Bioartificial Kidney	\$77,702 total
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(PI)	02/01/2012 - 06/30/2013
UCSF Clinical and Translational Science Institute	\$30,000 direct/yr1
Universal Bluetooth 4.0 Module and Data Transfer Protocol Framework for Clinical Device Studies	\$30,000 total
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(PI)	01/01/2013 - 12/31/2013
QB3 at UCSF	\$20,000 direct/yr1
Bootcamp for Microdevice Fabrication	\$20,000 total
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Bridging the Gap Award (J&J) (PI)	02/01/2012 - 01/31/2014
California Institute for Quantitative Biosciences	\$100,000 direct/yr1

Intravascular Capsule for Treatment of Type I Diabetes	\$100,000 total
(Co-I)	02/01/2013 - 06/30/2014
UCSF Research Allocation Program	\$30,000 direct/yr1
Educational Planning Grant: UCSF Biodevice Innovation Program	\$30,000 total
(PI)	06/01/2013 - 05/31/2014
University of California Proof of Concept	\$125,000 direct/yr1
Silicon Dialyzer Prototype	\$125,000 total
Bridging the Gap Award (Rogers) (PI)	02/01/2012 - 06/30/2014
California Institute of Quantitative Biosciences	\$100,000 direct/yr1
Intravascular Capsule for Treatment of Type I Diabetes	
(PI)	01/01/2013 - 12/31/2014
UC Research Opportunity Funds	\$18,000 direct/yr1
UC Biodevice Innovation Initiative for Eliminating Never Events	\$18,000 total
(PI)	08/01/2013 - 08/31/2015
UC Proof of Concept Award	\$125,000 direct/yr1
Silicon Dialyzer Prototype	\$125,000 total
1319268 (Co-I)	08/01/2013 - 07/31/2015
NSF	\$225,763 direct/yr1
National Science Foundation Partnerships for Innovation: Building Innovation Capacity Program Biomimetic Sealant for Aqueous Environments	\$600,000 total

PEER REVIEWED PUBLICATIONS

1. S. Furukawa, **S. Roy**, H. Miyajima, Y. Uenishi, and M. Mehregany, "Nickel surface micromachining" (Invited Paper), *Proceedings of the Symposium on Microstructures and Microfabricated Systems, 185th Meeting of the Electrochemical Society*, San Francisco, CA, USA, 1994, p. 38.
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81. P. Soler, N. Ferrell, D. Liepmann, P. Brakeman, W.H. Fissell, **S. Roy**. "Shear Stress Enhanced Proximal Tubule Cell Bioreactor Systems." American Society of Artificial Internal Organs (ASAIO), June 2014, Washington DC.
82. Z. Iqbal, S. Kim, B. Benner, E.J. Kim, A. Dolor, W.H. Fissell, **S. Roy**. "Hemocompatibility Enhancement of Silicon Nanopore Membranes (SNM) using Optimized Deposition of Thin-Film Poly(Sulfobetaine Methacrylate) (pSBMA)." American Society of Artificial Internal Organs (ASAIO), June 2014, Washington DC.
83. C. Kensinger, S. Karp, J. Groszek, P. Williams, R. Kant, T. Yeager, **S. Roy**, W.H. Fissell. "8-Day Implantation of Silicon Nanopore Hemofilter." American Society of Nephrology (ASN) - Kidney Week, November 2014, Philadelphia, PA.
84. A. Buck, J Groszek, **S. Roy**, W.H. Fissell. "Predicting Clot Formation in Implanted Hemofilters." American Society of Nephrology (ASN) - Kidney Week, November 2014, Philadelphia, PA.
85. P. Soler, N. Ferrell, W.H. Fissell, **S. Roy**, P. Brakeman. "Long-Term Water Transport and Barrier Function of Proximal Tubule Cells Cultured Under Apical Shear Flow Condit." American Society of Nephrology (ASN) - Kidney Week, November 2014, Philadelphia, PA.

86. C. Kensinger, S. Karp, J. Groszek, D. Laneve, P. Williams, B. Mi, M. Goodin, R. Kant, T. Yeager, **S. Roy**. "Implantable Hemofilter: 32 day Patency in a Canine Surgical Model." American Society of Nephrology (ASN) - Kidney Week, November 2014, Philadelphia, PA.
87. Jayagopal, P. Soler, N. Ferrell, P. Brakeman, D. Kroetz, W.H. Fissell, **S. Roy**. "Apical Shear Stress Enhances Organic Cation Transport in hOCT2/hMATE1 Transfected MDCK Cells." American Society of Nephrology (ASN) - Kidney Week, November 2014, Philadelphia, PA.
88. E.J. Kim, W.H. Fissell, T. Desai, **S. Roy**. "Slit Nanotopography on Silicon Nanopore Membranes Resists Protein Deposition and Cell Attachment." American Society of Nephrology (ASN) - Kidney Week, November 2014, Philadelphia, PA.
89. C. Kensinger, S. Karp, J. Groszek, D. Laneve, P. Williams, M. Goodin, R. Kant, T. Yeager, **S. Roy**, W.H. Fissell. "9 Day Filtration by an Implantable Hemofilter." American Society of Nephrology (ASN) - Kidney Week, November 2014, Philadelphia, PA.
90. S. Kim, C. Blaha, Z. Iqbal, C. Chow, R. Kant, B. Chui, K. Goldman, J. Park, E.J. Kim, W.H. Fissell, **S. Roy**. "Evaluation of Next-Generation Silicon Nanopore Membranes Optimized for Diffusive Clearance." American Society of Nephrology (ASN) - Kidney Week, November 2014, Philadelphia, PA.
91. E.J. Kim, W.H. Fissell, **S. Roy**. "Immunobarrier Characterization of Slit-Shaped Nanotopography for an Implantable Bioartificial Kidney." American Society of Artificial Internal Organs (ASAIO), June 2015, Chicago, IL.
92. W. Moses, S. Kim, E. Leeflang, C. Chow, Z. Iqbal, M. Wilson, **S. Roy**. "Renal Artery Embolization for Minimally Invasive Induction of Renal Failure." American Society of Artificial Internal Organs (ASAIO), June 2015, Chicago, IL.
93. B. Feinberg, J.C. Hsiao, A. Jayagopal, Z. Iqbal, A. Zydney, W.H. Fissell, **S. Roy**. "Real-Time Observation of Mass Transfer Limitations during Hemofiltration using Confocal Microscopy." North American Membrane Society (NAMS), May-June 2015, Boston, MA.

RESEARCH PROGRAM

Recent progress in microelectromechanical systems - the microelectronics, microfabrication and micromachining technologies known collectively as MEMS - is being applied to biomedical applications and has become a new field of research unto itself, known as BioMEMS. The technology is originally based upon the same technology that has been used to make computer chips ever more powerful and less expensive. MEMS technology has enabled low-cost, high-functionality devices in some commonly used areas, such as inexpensive printer cartridges for ink jet printing and chip-based accelerometers responsible for deployment of automotive airbags. BioMEMS applies these technologies and concepts to diverse areas in biomedical research and clinical medicine.

Our BioMEMS effort is directed at the medical device field where we can attract passionate clinicians, scientists, and engineers as collaborators. Areas of research emphasis include wearable and implantable sensing systems and artificial organ engineering. We have also broadened our scope beyond MEMS-based devices to address pediatric needs without compromising key attributes of MEMS design: devices that are produced more efficiently and function more effectively. For these devices, we also train the next generation of translation researchers, who will be prepared to disrupt the status quo in health care through a pedagogy

focused on identifying unmet clinical needs, inventing viable technology solutions, and implementing feasibility studies within a preclinical and clinical setting.

SIGNIFICANT PUBLICATIONS

1. **G. Kotzar, M. Freas, P. Abel, A. Fleischman, S. Roy, C. Zorman, J. Moran, J. Melzak. Evaluation of MEMS materials of construction for implantable medical devices. Biomaterials. 2002; 23(13):2737.**

<>This paper was the first to report on a systematic evaluation of MEMS materials via a battery of standardized tests acceptable to the FDA.

2. **A. Fleischman, R. Modi, A. Nair, J. Talman, G. Lockwood, S. Roy. Miniature high frequency focused ultrasonic transducers for minimally invasive imaging procedures. Sensors and Actuators A: Physical. 2003; 103(1-2):76.**

<>This paper describes the engineering basis for a miniature and high-resolution ultrasound imaging transducer that is for microstructural visualization of coronary arterial wall. The technology is currently getting ready for production by a leading medical device company.

3. **Mata, A. Fleischman, S. Roy. Characterization of polydimethylsiloxane (PDMS) properties for biomedical micro/nanosystems. Biomed Microdevices. 2005; 7(4): 281.**

<>PDMS is ubiquitous in microfluidics as well as many biomedical applications. This paper was the first to report on the material properties of PDMS that are relevant to the scientists and engineers designing next generation devices. It was among the top 3 most downloaded paper of the Biomedical Devices journal website.

4. **W. Fissell, A. Dubnisheva, A. Eldridge, A. Fleischman, A. Zydney, S. Roy. High-performance silicon nanopore hemofiltration membranes. Journal of Membrane Science. 2009, 326(1):58.**

<>This paper introduces the superior properties of silicon nanopore membranes (SNM) for renal replacement applications. SNM are a major focus of our laboratory research both for renal replacement as well as other applications.

5. **Mata, E. Kim, C. Boehm, A. Fleischman, G. Muschler, S. Roy. A three-dimensional scaffold with precise micro-architecture and surface micro-textures. Biomaterials 2009, 30(27):4610.**

<>This paper describes the development of a precisely engineered 3D scaffold using microfabrication and soft lithography techniques. It was used to demonstrate that precision surface topographies could be used to enhance osteoprogenitor growth.

ADDITIONAL RELEVANT INFORMATION:

2003 - 2008 Cleveland Clinic, Lerner Research Institute, Communications Committee, Member
2003 - 2005 Cleveland Clinic, Lerner Research Institute, Communications Committee , Chairperson
2006 - 2008 Ohio State University, NSF Center for Affordable Nanoengineering of Polymeric Biomedical

Devices, Scientific Evaluation Board, Member

2008 - 2008 Cleveland Clinic, Cleveland Clinic Magazine, Advisory Board, Member

2008 - 2008 Cleveland State University, Department of Civil Engineering, Visiting Committee Member