Curriculum Vitae **(updated: August 29, 2023)**

NAME: Elliot L. Botvinick

OFFICE ADDRESS AND PHONE NUMBER: 2416 Engineering Hall
University of California, Irvine
Irvine, CA 92697-1475
(949) 824-9613

CURRENT POSITION: Professor

DEPARTMENTS: Biomedical Engineering and Surgery

EDUCATION: **Ph.D. Bioengineering,** University of California, San Diego, June 2001.

M.S., Bioengineering, University of California, San Diego, June 1998.

B.S., Bioengineering, University of California, San Diego, June 1996.

PROFESSIONAL INTERESTS: Mechanobiology, optical tweezers, microrhelogy, mechanotransduction, type 1 diabetes, medical devices

ACADEMIC APPOINTMENTS

1. UNIVERSITY OF CALIFORNIA, IRVINE (inverse chronological order)
   a) Department of Biomedical Engineering (BME)
      i. Professor, 2018 - present
      ii. Associate Professor, 2013 - present
      iii. Assistant Professor, 2006 - 2013
   b) Department of Surgery
      i. Professor, 2018 - present
      ii. Associate Professor, 2013 - present
      iii. Assistant Professor, 2006 – 2013
   c) Beckman Laser Institute and Medical Clinic
      i. Professor, 2018-present
      ii. Associate Professor, 2013 - present
      iii. Assistant Professor, 2006 - 2013
      iv. Associate Specialist II, 2004 – 2006
      v. Beckman Fellow, 2001 – 2004
   d) Chemical Engineering and Materials Science
      i. Associate Professor, 2013 - present
      ii. Assistant Professor, 2006 - 2013

2. CORE FACULTY APPOINTMENTS
   a) Associate Director of the Edwards Lifesciences Foundation Cardiovascular Innovation and Research Center, member since its founding, 2009, Associate Director, 2015-current
   b) Beckman Laser Institute, University of California, Irvine, 2006
   c) Convergent Optical Sciences Initiative, 2019-present

AWARDS AND HONORS

- UCI Entrapraneurial Leadership Award, 2019
- UCI Henry Samueli School of Engineering Innovator of the Year, 2016
- UCI Engineering Faculty of the Year for Biomedical Engineering, presented by the Engineering Student Council, 2012
- UCI Chancellor's Award for Excellence in Fostering Undergraduate Research, May 14, 2011
- Arnold and Mabel Beckman Fellowship, Beckman Foundation, University of California Irvine, 2004

PROFESSIONAL ASSOCIATION MEMBERSHIPS

- Fellow, American Institute for Medical and Biological Engineering
- Member, Biomedical Engineering Society,
- Member, Optical Society of America
- Member, Biophysical Society,

PROFESSIONAL SERVICE AND ACTIVITIES:

Journals Served as a Reviewer past 5 years

The following is a partial list

- Science
- PNAS
- Lab on Chip
- Frontiers in Physics, Optics, and Photonics
- Science Advances
- Journal of Biomedical Engineering
- Biomaterials
- ACS Nano
- Journal of Biophysics
- Acta Biomaterialia
- American Journal of Physiology - Lung Cellular and Molecular Physiology
- PLoS ONE
- Annals of the Biomedical Engineering Society
- Journal of Biomedical Optics
- Optics Express
- Biophyscial Journal
- Cytometry
- Lasers in Medical Science
- IEEE Transactions on Biomedical Engineering
- Journal of Nanophotonics
- Microscopy Research

Conference Session Chair

- SPIE Optics and Photonics, Optical Trapping and Optical Micromanipulation, 2008Juvenile Diabetes Foundation, Chair of Subgroup on Clinical Study of Subcutaneous Implantation of Materials, 2015.
- Optical Society of America (OSA) Biomedical Optics Division: Technical Group on Optical
- Trapping, 2011
- SPIE Optics and Photonics, Optical Trapping and Optical Micromanipulation, 2008
- ASME International Mechanical Engineering Congress & Exposition, 2008
- Optical Society of America (OSA) Optical Trapping and Manipulation in Molecular and Cellular Biology Technical Group in the Bio-Medical Optics Division, (April 1, 2010 -2014).

Conferences Served as a Reviewer

- National Science Foundation, Recurring panelist, BISH/Biophotonics, Ad Hoc Reviewer, (December 2008 - 2014
- Research Grants Council (RGC) of Hong Kong, Ad Hoc Reviewer, (October 29, 2011).

Grant Reviews

- NIH NIBIB P41 review panel, 2021
- NIH NIBIB P41 review panel, 2022
- NIH Bioengineering, Biodata, and Biomodeling Technologies, 2023
- NIH Cellular, Molecular, Bioanalytical and Imaging, 2023
- NIH NIDDK Advancement of Cell Replacement Therapies for TD1, 2022
- Uniteßd States – Israel Binational Science Foundation, 2023
- National Institutes for Health – multiple panels and chairs 2017-
- National Science Foundation – multiple panels including CAREER, 2007-current
- Juvenile Diabetes Research Foundation – multiple panels, 2015-
- Leona M. and Harry B. Helmsley Charitable Trust, 2017-
- MEXUS, 2014
- Research Grants Council (RGC) of Hong Kong, 2015-

Grant Review Director

- Director for the NIH HLBI University of California Center for Advanced Innovation: medical device panel, 2015-

Consulting

- Scientific Advisory Board-Islet Sciences, Inc. (March 21, 2012 - 2013).
- For Profit Organization, Sonendo Inc., Laguna Hills, CA. (June 5, 2011 - 2015).
- Fjord Ventures, Laguna Hills, CA. (April 1, 2011 - 2016).
- DentaTech, Inc., Laguna Hills, CA. (June 1, 2010 - June 5, 2011)
- Salk Institute, La Jolla, CA. (2006).

Entrepreneurial activities

- Founder, Cactus Medical, LLC (2017 - 2023)
- Founder, Filedionics, Inc (2017 - 2022)
- Founder, Canary Medical, Inc (2014-2016)
- Founder, Metronom Health, Inc. (2009 - Present)
- Founder, subQ, LLC. (2003 - Present)
- Koa Accel, Scientific Affairs (2019 – Present)

ACADEMIC ADVISEES: (inverse chronological order)

Postdoctoral

1. Todd Thorson, PhD UC Irvine, 2019 - 2020
2. Mark Keating, PhD UC Irvine, 2018-present
3. Samir Shreim, PhD UC Irvine, 2017 - 2022
4. Sean White, PhD UC Irvine, 2013 - 2020
5. John Weidling, PhD UC Irvine, 2014 - present
6. Bhupinder Shergill, PhD UC Irvine, 2012 - 2017
7. Viera Crosignani, PhD UC Irvine, 2013 - 2016
8. Martha Alvarez, PhD Tecnologico de Monterrey, 2009 – 2015

9. Sung Hur, 2007 – 2009
10. Veneranda Garces, PhD Paris-Sud University (Paris XI), 2007 - 2008

Doctoral

1. Yriannah Richards (BME) 2023 - present
2. Michelle Lanterman (BME) 2021 - present
3. Sarah Eldeen (MCSB) 2021 - present
4. Toni Wilkinson (BME) 2020 - present
5. Luciano Groisman (BME) 2020-present
6. Alyse Gonthier (MSE), 2019-present
7. Alicja Jagiełło (BME) 2017-2022
8. Bryce Wilson (CBE) 2017-2022
9. Qinda Hu (MCB), 2017 – 2022,
10. Dat Nguyen (BME) 2017-2021
11. Rachel Gurlin (BME), 2014 – 2021,
12. Avid Najdahmadi (BME), 2014 –
13. Mark Keating (BME), 2013
14. Todd Thorson (CHEMS), 2015 - 2019
15. Shreyas Ravindranath (BME), 2011 – 2016
16. Justin Luo, (CHEMS), 2011 - 2015
17. Abhishek Kurup (BME), 2010 – 2015
18. John Weidling (BME), 2009 – 2014
19. Jonathan Compton (BME), 2009 – 2014
20. Bhupinder Shergill, (BME), 2007 – 2012
21. Samir Shreim (BME), 2006 – 2011,
22. Maxwell Kotlarchyk (BME), 2006 - 2011

Masters

1. Bilal Saudi, CBE 2022-present
2. Eric Hsu, BME 2022-present
3. Mellonie Zhang, BME, 2017-2019
4. Danielle Behrens, BME, 2017-2019
5. Renu Jayakrishnan, BME, 2014,
6. James Yamada, BME, 2013
7. Erwin Yap, BME, 2012
8. Sepeher Vatanpour, BME, 2012
9. Shirin Yavari, BME, 2009
10. Mehrzad Heidari, BME, 2009
11. Nicole Hori, BME, 2008,
12. Chandandeep Kaur, BME, 2008

Undergraduate

1. Athena Weber, BME, 2023 – current
2. Lucas Jones, BME, 2023 – current
3. Katherine Trimble, BME, 2021
4. Yriannah Richards, Hampton University, HBCU summer program
5. Ulysses Castillo, BME, 2021 – 2023
6. Ryan Myrick, BME, 2021-2023
7. Bilal Saudi, CBE, 2021
8. Monika Lyons, BME, 2021 - 2023

9. Aryan Agarwal, BME, 2020-2023
10. Khalid Hampton, Hampton University HBCU summer program
11. Lawrence Miles, Hampton University, HBCU summer program
12. Rahul Sreedasyam, BME 2019-current
13. Maria Cacaido, BME, 2019-current
14. Toni Wilkinson, BME 2017-current
15. Luciano Groisan, BME, 2017-current
16. Christopher Elhosni, BME 2017-2020
17. John Betts, BME, 2019-current
18. Micah Lawrence, BME 2019-current
19. Joshua Park, EECS 2020
20. Ashleigh Carter, Clark University Atlanta, HBCU summer program
21. Micah Lim, ESURP Awardee, 2016 - 2021
22. Danielle Behrens, ESURP Awardee, 2015 - present
23. Eashani Sathialingam, ESURP Awardee, 2015 – 2017, currently a PhD student at Georgia Tech
24. Erik Noel, 2013-2016, current affiliation: Project Engineer at NeoTract
25. Anthony Pham, 2013 – 2015, current affiliation: Engineer at Edwards Lifesciences
26. Janelle Halog, SURP Awardee, 2013-2015, current affiliation: Project Coordinator at Advanced Civil Technologies
27. Tim Tran, two-time ESURP Awardee, 2012 – 2016, currently attending USC Gould School of Law
28. Mark Keating, SURP Awardee, 2010 – 2013, currently a PhD student in my lab
29. Kristen MacNeal, 2011- 2013, current affiliation: Mechanical Engineer at NASA's Jet Propulsion Laboratory
30. Sohan Weeraratne, 2011 – 2013, current affiliation: Product Line Quality Engineer, Alcon – A Novartis Divsion
31. Michael Estabridis, ESURP Awardee, 2012 – 2015, current affiliation: Manufacturing Engineer at Teleflex Medical OEM
32. Breanna Padilla, ESURP Awardee, 2009- 2012, current affiliation: Project Engineer at Freudenberg Medical
33. Dhivya Sridhar, 2009 – 2011, current affiliation: Product Manager at Medtronic Diabetes
34. Deena Jamal, ESURP Awardee, 2009 2010, current affiliation: Senior Engineer, R & D at Edwards Lifesciences
35. Abid Mustansir, 2008 - 2010, current affiliation: Patent Analyst at Global Patent Solutions
36. Andre Paredes, SURP Awardee, 2008 – 2010, current affiliation: Graduate Student Research Assistant for Laboratory for Live-Cell Imaging & Ultrafast Laser Microsurgery
37. Scott Strayer, ESURP Awardee, 2008 - 2010, current affiliation: R & D Engineer at Johnson & Johnson
38. Bela Abolfathi, 2009 - 2009
39. Jamie Evora, ESURP Awardee, 2007 – 2009, current affiliation: Lab Manager at Thermo Fisher Scientific
40. Justin Lin, 2008 – 2009, current affiliation: R & D Engineer at Johnson & Johnson
41. Nazilla Norouzi, 2008 - 2009, received a PhD in Bioengineering/Biomedical Engineering at UC Riverside.

High School Student Mentoring

1. Ishan Vannadil, 2023
2. May Riley, 2023
3. Maxin Marinez, 2020
4. Micah Lim (2015, 2016)

5. Jasper Huang (2015, 2016)
6. Christian Duhay (2016, 2017),

Other

1. Stephanie Ellis, undergraduate student from Seattle Pacific Universtiy
2. Emilia de Elonzo – Masters student from Institut Quimic de Sarria, Spain
3. Participated in over 40 qualifying exams.
4. Participated in over 20 PhD and Master Thesis committees.

FUNDING: (extramural grants typed in boldface, indicated amounts are direct costs)

Active

Helmsley Charitable Trust R-2110-04834 PI: Botvinick 01/2021 – 12/2024
Development of a muilti-analyte sensor – glucose, lactate, oxygen, ketones, insulin
Total Award: $3,472,559
Role: PI

NIH R01 EB033417-01A1 PI: Botvinick 04/2023 – 03/2028
Metabolic and hemodynamic sensor for monitoring throughout the continuum of care
Total Award: $3,830,670
Role: PI

NSF 2324716 PI: Williams 10/2023 – 09/2027
Collaborative Research: IIBR Instrumentation: A continuous metabolite sensor for lab and field studies
Total UCI Award: $1,447,087
The bulk of the award is assigned to Botvinick
Role: co-PI

NIH R01 HL085339 PI: Putnam 04/2021 – 03/2025
Microenvironmental control of capillary morphogenesis
Total Award to UCI: $484,090 over four years
Role: Subcontract PI

NSF, DMS-1953410 UC Irvine PI: Botvinick NCE
Collaborative Research: Multiscale and Multiphasic Modeling of Single and Collective Migration in Fibrous Extracellular Matrices
Role: UC Irvine **PI**
Total Award: $450,000

AFOSR (FA9550-17-1-0193) PI: Berns NCE
Advanced Optical Technologies for Defense Trauma and Critical Care
Role: Co-I
Total Award: $ 213, 869

NIH NIGMS (1R01GM129426-01A1) PI: Venugopalan NCE
A Biophotonics Platform for Mechanotransduction and Metabolic Microscopy
Role: Co-I
Total Award: $594,916

JDRF/Helmsley Charitable Trust (2-SRA-2017-504-S-B) PI: Botvinick NCE
Lactate Monitoring for AP Control During Exercise
Role: PI
Total Award: $1,309.790

Recently Completed

NSF CMMI (2035264) PIs Grosberg and Liu 10/01/2020-09/30/2023
COVID-19 and the Role of the Immune System in Cardiac Function and Pathology
Total Award: $547,168
My portion of award: 0.1 months effort and $5k per year supply
Role: Co-I

NIH, NIDCD (1R43-DC018248-01) PI: Weidling (SBIR Cactus Medical, LLC) 09/1/2019-08/31/2021
Clinical Validation of a novel hand-held optical measurement system to enable 1-touch assessment of middle ear effusion in standard otoscopy.
The major goal of this project is clinical testing of a new diagnostic for ear infection. Clinical studies are conducted by my laboratory in collaboration with Professor Hamid Djalilian.
Role: Subcontract **PI**
Total Award: $ 60,556

NIH, Office of the Director (S10OD025064) PI: Botvinick 08/01/2019 – 01/31/2020
Multiphoton Microscope for Cardiovascular and Tissue Engineering
This instrument will be used to support NIH funded research projects at the Edwards Lifesciences Center for Advanced Cardiovascular Technology (ELCACT) at the University of California, Irvine. This state-of-the-art instrument will enrich the mission of the ELCACT to create an environment for cohesive, breakthrough research in the area of cardiovascular technology and tissue engineering.
Role: PI
Total Award: $1,872,002

JDRF (3-SRA-2019-767-S-B) MPIs: Botvinick and Mohraz 04/01/2019-03/31/2022
Improving infusion set lifetime and reliability using bijel-templated materials
The major goal is to develop a 14-day insulin infusion set and conduct PD/PK tests in swine. The infusion set incorporates a new class of biomaterials which morphologically programs macrophages to promote a dense vasculature within the lumen of a cannula.
Role: **MPI**
Total Award: $1,426,971

JDRF (3-SRA-2018-532-M-B) PI: O'Neal 09/26/2018 – 05/31/2021
Improving the Daily Lives of People with Type 1 Diabetes by Meeting the Challenges of Glucose Control through the Development of a Next Generation Closed Loop System
The major goal for this project is to determine the relationship between blood analytes, including lactic acid, and post-exercise glycemia in subjects with type 1 diabetes towards an improved automated insulin delivery system.
Role: Subcontract PI
Total Award: $156,317

Helmsley Charitable Trust (2018PG-T1D008) PI: Botvinick, PI 10/01/2017 – 09/31/2021
Continuous Insulin Monitor
We aim to accelerate the development of a transcutaneous, continuous insulin monitor to improve treatment of T1D through real-time, actionable, quantification of subcutaneous interstitial insulin. This proposal continues in no cost extension.
Role: **PI**
Total Award: $383,808

NIH, NIEHS (1U54ES027698) PI: Brenner 09/30/2016-08/31/2021
Development of antidotes for toxic gases
Photonics Core for the NIH CounterACT U54 Center, providing OCT imaging systems, lactate monitoring capabilities for airway injury determinations and rabbit toxic gas inhalation models for advanced antidote testing and development.
Role: Co-I
Total Award to my laboratory: $115,000

Other completed

JDRF (2-SRA-2017-330-Q-R) PI: Botvinick 10/01/2017- 06/30/2019
Modification of the human insulin receptor for in vivo monitoring
This project supports discovery of a mutant form of the human insulin receptor that produces an optical signal upon binding insulin. This receptor is then placed in a transcutaneous probe for the continue monitoring of insulin concentration in the subcutaneous tissue.
Role: PI

NIH NIBIB: EB015890-38 PI: B. Tromberg 04/14/13-03/31/19
A Laser Microbeam Biotechnology Resource
The major goal of this study is to combine optical tweezers with non-linear imaging for study of cancer
Role: Co-I

JDRF 3-SRA-2016-255-S-B PI: Lakey 06/01/16-05/31/19
An Islet friendly Pre-vascularized and Innervated Subcutaneous Scaffold
The major goal of this project is to develop a new macro-encapsulation device for implanting stem-cell derived pancreatic tissue for the treatment of type 1 diabetes.
Role: Co-I

JDRF: 1-INO-2017-443-A-N PI: Botvinick 06/01/2017-10/31/2018
Juvenile Diabetes Research Foundation
Novel passive coating to improve infusion set lifetime
The major goal of this project is to test a templated hydrogel as an improved coating that induces a dense new vasculature to extend the lifetime of transcutaneous insulin infusion sets.
Role: PI

NHLBI: R01 HL085339-09 PI: A. Putnam 8/08/2014-3/31/18
Microenvironmental Control of Capillary Morphogenesis
The goal of this study is to understand how stroma-mediated tissue proteolysis determines capillary phenotype through regulation of pericellular biophysical properties.
Role: Co-I

PUBLICATIONS: (inverse chronological order)

Peer-Reviewed Book Chapters and Articles

[BC7] Dunn, C. E., Crouzet, C., Keating, M. T., Phan, T., Brenner, M., Botvinick, E. L., & Choi, B. (2022). CPAP-to-Ventilator: Open-Source Documentation, UC Irvine. In *Mechanical Ventilation Amid the COVID-19 Pandemic: A Guide for Physicians and Engineers* (pp. 233-241). Cham: Springer International Publishing

[BC6] Alexander, M., Nguyen, H., Flores, A., Li, S., De Vos, P., Botvinick, E., Lakey J. (2016). Avoiding Immunosuppression for islet transplantation: use of protective biomaterials. In A. Seicean (Ed.), *Challenges in Pancreatic Pathology*. IntechOpen.

[BC5] Shi, L. Z., Berns, M. W., Botvinick, E. L. (2008). 'RoboLase': Internet-accessible robotic laser scissors and laser tweezers microscope systems. In V. Bozovic (Ed.), *Medical Robots.* Vol. I-Tech Education and Publishing. Vienna, Austria.

[BC4] Shao, B., Nascimento, J. M., Shi, L. Z., Botvinick, E. L. (2007). Automated Motile Cell Capture and Analysis with Optical Traps. In M. W. Berns, K. O. Greulich (Eds.), *Methods Cell Biol.* Vol. 82, Laser manipulation of Cells and Tissues. Boston, MA: Elsevier Press.

[BC3] Botvinick, E. L., Wang, Y. (2007). Laser Tweezers in the Study of Mechanobiology in Live Cells. In M.W. Berns, K. O. Greulich (Eds.), *Methods Cell Biol..* Vol. 82, Laser manipulation of Cells and Tissues. Boston, MA: Elsevier Press.

[BC2] Botvinick, E. L., Shah, J. V. (2007). Laser-based measurements in cell biology. In M. W. Berns, K. O. Greulich (Eds.), *Methods Cell Biol.* Vol. 82, Laser manipulation of Cells and Tissues. Boston, MA:Elsevier Press.

[BC1] Berns, M. W., Botvinick, E. L., Liaw, L.-h., Sun, C.-H., Shah, J. (2005). Cell Biology: A Laboratory Handbook. In J. E. Celis (Ed.), *Micromanipulation of chromosomes and the mitotic spindle using laser microsurgery (laser scissors) and laser-induced optical forces (laser tweezers).* 3 edition. Micromanipulation of chromosomes and the mitotic spindle using laser microsurgery (laser scissors) and laser-induced optical forces (laser tweezers). Vol. 3. (pp. 351-363). Academic Press.

Peer-Reviewed Journal Articles (inverse chronological order)

[J75] Gonthier, A., Botvinick,E., Grosberg, A., Mohraz, A. (2023). Effect of porous substrate topographies on cell dynamics: a computational study. *ACS Biomaterials Science & Engineering*, Accepted.

[J74] Myrick, R. J., Shang, K. M., Betts, J. F., Gonzalez, N., Rawson, J., Izumi, K., ... & Komatsu, H. (2022). Micropyramid-patterned, oxygen-permeable bottomed dish for high density culture of pancreatic islets. *Biofabrication*, *15*(1), 015018.

[J73] Jagiełło, A., Castillo, U. **Botvinick, E.** (2022). Cell mediated remodeling of stiffness matched collagen and fibrin scaffolds. *Scientific Reports.* 12 (1). PMCID: PMC9273755

[J72] Jagiełło, A., Hu, Q., Castillo, U. **Botvinick, E.** (2022). Patterned photocrosslinking to establish stiffness anisotropies in firous 3D hydrogels. *Acta Biomaterialia*, 141, 39-47. PMCID: PMC9552552

[J71] Nguyen, D., Lawrence, M. M., Berg, H., Lyons, M. A., Shreim, S., Keating, M. T., ... & Botvinick, E. L. (2022). Transcutaneous flexible sensor for In vivo photonic detection of pH and lactate. *ACS sensors*, *7*(2), 441-452.

[J70] Thrivikraman, G., Jagiełło, A., Lai, V. K., Johnson, S. L., Keating, M., Nelson, A., ... & Tranquillo, R. T. (2021). Cell contact guidance via sensing anisotropy of network mechanical resistance. *Proceedings of the National Academy of Sciences*, *118*(29), e2024942118.

[J69] Slepukhin, V. M., Grill, M. J., Hu, Q., Botvinick, E. L., Wall, W. A., & Levine, A. J. (2021). Topological defects produce kinks in biopolymer filament bundles. *Proceedings of the National Academy of Sciences*, *118*(15), e2024362118.

[J68] Dror, N., Weidling, J., White, S., Ortenzio, F., Shreim, S., Keating, M. T., ... & Botvinick, E. (2021). Clinical evaluation of a novel subcutaneous lactate monitor. *Journal of clinical monitoring and computing*, 1-7.

[J67] Wilson, B. G., Fan, Z., Sreedasyam, R., Botvinick, E. L., & Venugopalan, V. (2021). Single-shot interferometric measurement of cavitation bubble dynamics. *Optics letters*, *46*(6), 1409-1412.

[J66] Hu, Q., Morris, T. A., Grosberg, A., Levine, A. J., & Botvinick, E. L. (2021). Actively driven fluctuations in a fibrin network. *Frontiers in Physics*, *8*, 568736.

[J65] Jagiełło, A., Lim, M., Botvinick, E.* (2020) . Dermal fibroblasts and triple-negative mammary epithelial cancer cells differentially stiffen their local matrix. APL Bioengineering, 046105. PMCID: PMC7719046

[J64] Luo JC, Ching H, Wilson BG, Mohraz A, Botvinick EL, Venugopalan V: Laser cavitation rheology for measurement of elastic moduli and failure strain within hydrogels. Scientific Reports 2020, 10(1):13144.

[J63] Smink AM, Najdahmadi A, Alexander M, Li S, Rodriquez S, van Goor H, Hillebrands J-L, Botvinick E, Lakey JR, Vos Pd: The Effect of a Fast-Releasing Hydrogen Sulfide Donor on Vascularization of Subcutaneous Scaffolds in Immunocompetent and Immunocompromised Mice. Biomolecules 2020, 10(5):722.

[J62] Shreim S, Abouzari M, Weidling J, White S, Goshtasbi K, Pham N, Djalilian HR, Botvinick E: A Bench-Top Model of Middle Ear Effusion Diagnosed with Optical Tympanometry. International Journal of Pediatric Otorhinolaryngology 2020:110054.

[J61] Nguyen D, Behrens DM, Sen S, Najdahmadi A, Pham JN, Speciale G, Lawrence MM, Majumdar S, Weiss GA, Botvinick EL: Photostable and Proteolysis-Resistant Förster Resonance Energy Transfer-Based Calcium Biosensor. Analytical Chemistry 2020, 92(11):7683-7689.

[J60] Najdahmadi A, Smink AM, de Vos P, Lakey JR, Botvinick E: Non-Invasive Monitoring of Oxygen Tension and Oxygen Transport Inside Subcutaneous Devices After H2S Treatment. Cell Transplantation 2020, 29:0963689719893936.

[J59] Najdahmadi A, Gurlin R, Zhang M, Lakey JR, Botvinick E: Oxygen Monitor to Study Vascularization of Medical Devices. MRS Advances 2020, 5(18-19):991-1000.

[J58] Thorson TJ, Gurlin RE, Botvinick EL, Mohraz A: Bijel-templated implantable biomaterials for enhancing tissue integration and vascularization. Acta biomaterialia 2019, 94:173-182.

[J57] McDevitt KM, Thorson TJ, Botvinick EL, Mumm DR, Mohraz A: Microstructural characteristics of bijel-templated porous materials. Materialia 2019, 7:100393.

[J56] Keating M, Lim M, Hu Q, Botvinick E: Selective stiffening of fibrin hydrogels with micron resolution via photocrosslinking. Acta biomaterialia 2019, 87:88-96.

[J55] Hsieh JY, Keating MT, Smith TD, Meli VS, Botvinick EL, Liu WF: Matrix crosslinking enhances macrophage adhesion, migration, and inflammatory activation. APL bioengineering 2019, 3(1):016103

[J54] Gelfand JA, Nazarian RM, Kashiwagi S, Brauns T, Martin B, Kimizuka Y, Korek S, Botvinick E, Elkins K, Thomas L: A pilot clinical trial of a near-infrared laser vaccine adjuvant: safety, tolerability, and cutaneous immune cell trafficking. The FASEB Journal 2019, 33(2):3074-3081.

[J53] Zhang Y, Alexander M, Yang S, Bian Y, Botvinick E, Lakey JR, Ozcan A: High-throughput screening of encapsulated islets using wide-field lens-free on-chip imaging. ACS Photonics 2018, 5(6):2081-2086.

[J52] Thorson TJ, Botvinick EL, Mohraz A: Composite bijel-templated hydrogels for cell delivery. ACS biomaterials science & engineering 2018, 4(2):587-594.

[J51] Najdahmadi A, Lakey JR, Botvinick E: Structural characteristics and diffusion coefficient of alginate hydrogels used for cell based drug delivery. MRS Advances 2018, 3(40):2399-2408.

[J50] Juliar BA, Keating MT, Kong YP, Botvinick EL, Putnam AJ: Sprouting angiogenesis induces significant mechanical heterogeneities and ECM stiffening across length scales in fibrin hydrogels. Biomaterials 2018, 162:99-108.

[J49] Hou J, Williams J, Botvinick EL, Potma EO, Tromberg BJ: Visualization of breast cancer metabolism using multimodal nonlinear optical microscopy of cellular lipids and redox state. Cancer research 2018, 78(10):2503-2512.

[J48] Keating, M., Kurup, Alvarez-Elizondo, M., Levine, A.J., Botvinick, E.(2017). Spatial distributions of pericellular stiffness in natural extracellular matrices are dependent on cell-mediated proteolysis and contractility. *Acta Biomaterialia,* 57, 304-312. doi: 10.1016/j.actbio.2017.05.008. PMID: 28483696 PMCID: PMC5526213.

[J47] Romero-López, M., Trinh, A. L., Sobrino, A., Hatch, M. M., Keating, M. T., Fimbres, C., Lewis, D. E., Gershon, P. D., **Botvinick, E. L.**, Digman, M., Lowengrub, J. S., Hughes, C. C. (2017). Recapitulating the human tumor microenvironment: Colon tumor-derived extracellular matrix promotes angiogenesis and tumor cell growth. *Biomaterials, 116*, 118-129. 0142-9612. doi: 10.1016/j.biomaterials.2016.11.034. PMCID: PMC5226635. PMID: 27914984.

[J46] Gurlin, R. E., Keating, M. T., Li, S., Lakey, J. R. T., de Feraudy, S. M., Shergill, B. S., **Botvinick, E. L.** (2017). Vascularization and innervation of slits within polydimethylsiloxane sheets in the subcutaneous space of athymic nude mice. *Journal of tissue engineering, 8*, 2041731417691645. doi: 10.1177/2041731417691645. PMID: 28228933.

[J45] Hsieh, J. Y., Smith, J., Meli, V. S., Tran, T. N., **Botvinick, E. L.**, Liu, W. (2017). Differential regulation of macrophage inflammatory activation by fibrin and fibrinogen. *Acta biomaterialia, 47*, 14-24. 1742-7061. doi: 10.1016/j.actbio.2016.09.024. PMID: 27662809.

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PRESENTATIONS

Student Poster/Oral Presentations (inverse chronological order, name of student underlined)

[SP49] Michelle Lanterman, Irene Zhang, Sarah Eldeen, Ulysses Castillo, Andrew Putnam, Elliot Botvinick, Optical tweezers assessment of local ECM mechanical heterogeneity during capillary morphogenesis. International Society of Optics Photonics: Nanoscience + Engineering. San Diego, CA. August 2023.

[SP48] Alicja Jagiełło, Qingda Hu, Ulysses Castillo, Elliot Botvinick, Using light to establish and measure stiffness gradients in three-dimensional engineered tissues, International Society of Optics Photonics: Nanoscience + Engineering. San Diego, CA. August 2021.

[SP47] Alicja Jagiełło, Micah Lim, Elliot Botvinick, Dermal fibroblasts and human breast cancer cells differentially stiffen their local matrix, 13th European Biophysics Conference, Vienna, Austria, July 2021.

[SP46] Alicja Jagiełło, Micah Lim, Elliot Botvinick, Cells Establish Spatially Heterogeneous And Anisotropic Stiffness Landscapes – Direct Measurements, SB3C2020 Summer Biomechanics, Bioengineering and Biotransport Conference (Virtual), June 2020.

[SP45] Alicja Jagiełło, Daniel Ramirez-Guerrero, Eoin McEvoy, Vivek Shenoy, Elliot Botvinick, John Lowengrub, Unraveling how interactions of chemical signaling and mechanical forces influence cell fate decisions and behaviors of growing tissues, 2nd Annual Symposium on Multiscale Cell Fate, NSF-Simons Center for Multiscale Cell Fate Research, UC Irvine, October 2019.

[SP44] Alicja Jagiełło, Daniel Ramirez-Guerrero, Eoin McEvoy, Vivek Shenoy, Elliot Botvinick, John Lowengrub, Unraveling how interactions of chemical signaling and mechanical forces influence cell fate decisions and behaviors of growing tissues, Early-Career Researcher Symposium 2019, NSF-Simons Center for Multiscale Cell Fate Research, UC Irvine, March 2019.

[SP43] Alicja Jagiełło, Qingda Hu, Ulysses Castillo, Elliot Botvinick, Patterned photocrosslinking to create stiffness gradients and local anisotropies in 3D hydrogels, 2021 Biomedical Engineering Society Annual Meeting, Orlando, FL, October 2021.

[SP42] Alicja Jagiełło, Micah Lim, Elliot Botvinick, Dermal fibroblasts and breast cancer cells differentially alter their local stiffness landscape, American Physical Society March Meeting 2021 (Virtual), March 2021.

[SP41] Alicja Jagiełło, Micah Lim, Elliot Botvinick, Cells differentially alter their local stiffness landscape as assessed, 65th Virtual Annual Meeting of the Biophysical Society, February 2021.

[SP40] Alicja Jagiełło, Daniel Ramirez-Guerrero, Eoin McEvoy, Vivek Shenoy, Elliot Botvinick, John Lowengrub, Unraveling how interactions of chemical signaling and mechanical forces influence cell fate decisions and behaviors of growing tissues, NSF-Simons visit to Center for Multiscale Cell Fate Research at UCI, Irvine, CA, USA, October 2019.

[SP39] Thorson, T. J., Mohraz, A., Botvinick, E. L. (2016, November). Cell delivery systems via complex emulsion templated hydrogels. Technical session paper presentation at the annual meeting of American Institute of Chemical Engineers, San Francisco, CA.

[SP28] Thorson, T. J., Mohraz, A., Botvinick, E. L. (2017, June). Tissue response & integration in biomaterial implants derived from morphologically unique emulsion gels. UC System-Wide Bioengineering Symposium, Los Angeles, CA.

[SP27] Thorson, T. J., Botvinick, E. L., Mohraz, A. (2017, July). Tissue integration & cell delivery using morphologically unique bijel-derived materials. ACS Colloid & Surface Science Symposium, New York, NY.

[SP26] Gurlin, R., Shergill, B., Botvinick, E. (2017), Poster Presentation, Two Phase Approach to Beta Cell Replacement Tissue Transplantation UC Irvine Institute for Clinical Translational Science (ICTS) Research Day.

[SP25] Gurling, R. and Botvinick, E. Poster Presentation, Two-Phase Implantation of Pancreatic Islets via a Skin Integrated Sheet, UC System wide BME symposium, Los Angeles July 2017

[SP24] Gurlin, R. and Botvinick, E. University of Tsukuba, Japan, Global Science Week**,** Best Entrepreneur Award**,** Tsukuba, Japan September 2016

[SP23] Gurlin, R., Shergill, B., Najdahmadi, A. Oral Presentation, Sher Biomedical, Fearless in the Fight for Better Diabetes Treatment, Sept 2016

[SP22] Gurlin, R., Shergill, B., Botvinick, E., Poster Presentation, Two Phase Approach to Beta Cell Replacement Tissue Transplantation UC Irvine Institute for Clinical Translational Science (ICTS) Research Day, JUNE 2016

[SP21] Najdahmadi, A., Weidling, J.**,** White, S., Ortenzio, F., Radom-Aizik, S., Botvinick, E. "Novel Continuous Lactate Monitor Passes Pilot Clinical Study: One Step Closer to Field-Deployable Early Warnings of Shock and Enablement of Lactate-Guided Therapy", Military Health System Research Symposium August 2017.

[SP20] Weidling, J.**,** De Alonso, E., White, S., Botvinick, E. "Optical Continuous Lactate Monitor for Combat Casualty Care", Military Health System Research Symposium August 2014.

[SP19] Weidling, J.**,** Botvinick, E. "Implantable Optical Continuous Lactate Sensor in Cyanide Poisoning Model", Annual meeting of the Biomedical Engineering Society, Seattle, WA September 2013

[SP18] Weidling, J., Isikman, S. O., Greenbaum, A., Ozcan, A., & Botvinick, E. "Can capillaries grown in 3D culture be imaged without the use of an optical lens system?", Annual meeting of the Biomedical Engineering Society, Seattle, WA September 2013

[SP17] Botvinick, E., Alvarez, M., Kurup, A.**,** Keating, M. "Mapping Mechanical Properties of The Extra Cellular Matrix Surrounding Cells Cultured in 3D." *Biophysical Journal*. 2014.106(2):235a

[SP16] Kurup, A., Tlsty, T., Botvinick, E. "The third dimension: Using the right mechanical model for mammary morphogenesis." *Tissue Engineering Part A*. 2014

[SP15] Kurup, A.**,** Botvinick, E. "Mapping Matrix Mechanics in 3D to Study the Role of Stiffness in Breast Tumor Progression." *Cancer Research*. 2013.73(8)

[SP14] Kurup, A., Tlsty, T., Botvinick, E. "*The Third Dimension: Mechanics and Mammary Morphogenesis*." Tissue Engineering and Regenerative Medicine International Society (TERMIS). Washington, DC. December 2014.

[SP13] Kurup, A., Keating, M., Alvarez, M., Botvinick E. "*Quantifying Change in Stiffness Heterogeneity in 3D Around Cells Embedded in Natural ECMs Over Time*." International Society of Optics Photonics: Nanoscience + Engineering. San Diego, CA. August 2014.

[SP12] Kurup, A., Yu, C., Tlsty, T., Botvinick, E. "*ECM Stiffening Potentiates ErbB2-Mediated Invasion as Observed in 3D Scaffolds of Identical Composition*." Global Science Week. Tsukuba, Japan. October 2013.

[SP11] Alvarez, M., Kurup, A., Keating, M, Botvinick E. "*Automatic Optical Tweezers Based Active Microrheology*." Biomedical Engineering Society Annual Conference 2013. Seattle, WA. September 2013.

[SP10] Kurup, A., Yu, C., Tlsty, T., Botvinick, E. "*ECM Stiffening Potentiates ErbB2-Mediated Invasion as Observed in 3D Scaffolds of Identical Composition*." 14th UC Systemwide Bioengineering Symposium. San Diego, CA. June 2013.

[SP9] Kurup, A., Tlsty, T., Botvinick, E. "*Mapping Matrix Mechanics in 3D to Study the Role of Stiffness in Breast Tumor Progression*." AACR Annual Meeting. Washington, DC. April 2012.

[SP8] Kurup, A., Botvinick, E. "*Using Active Microrheology to Map Matrix Mechanics in 3D*." BMES Annual Meeting. Atlanta, GA. October 2012.

[SP7] Kurup, A., Botvinick, E. "*Using Active Microrheology to Map Matrix Mechanics in 3D*." UC Systemwide Bioengineering Symposium. Berkeley, CA. June 2012.

[SP6] Kurup, A., Tlsty, T., Botvinick, E. "*The Third Dimension: Mechanics and Mammary Morphogenesis*." UC Systemwide Bioengineering Symposium. Irvine, CA. June 2014

[SP5] Kurup, A., Keating, M. Alvarez, M., Botvinick, E. "*Quantifying Change in Stiffness Heterogeneity in 3D Around Cells Embedded in Natural ECMs*." UC Systemwide Bioengineering Symposium. Irvine, CA. June 2014.

[SP4] Kurup, A., Yu, C., Tlsty, T., Botvinick, E. "*ECM Stiffening Potentiates ErbB2-Mediated Invasion as Observed in 3D Scaffolds of Identical Composition*." Biomedical Engineering Society Annual Conference 2013. Seattle, WA. September 2013.

[SP3] Kurup, A., Yu, C., Tlsty, T., Botvinick, E. "*ECM Stiffening Potentiates ErbB2-Mediated Invasion as Observed in 3D Scaffolds of Identical Composition*." PS-OC NIH Site Visit. Salk Institute, San Diego, CA. September 2013.

[SP2] Kurup, A., Yu, C., Tlsty, T., Botvinick, E. "*ECM Stiffening Potentiates ErbB2-Mediated Invasion as Observed in 3D Scaffolds of Identical Composition*." PS-OC 4th Annual Meeting. Phoenix, AZ. April 2013.

[SP1] Weidling, J., Kurup, A., Shreim S., Alvarez-Elizondo, M., Botvinick. E. "*Characterizing the Mechanical Relationship Between Cells and ECM Using Laser Tweezer Active Microrheology in 3D Hydrogels*." Edwards Lifesciences Center Open House. Irvine, CA. October 2011.

Oral Presentations (inverse chronological order)

[OP48] Botvinick, E.L., "Using light to establish and measure stiffness gradients in three-dimensional engineeredtissues", California State Univrsity Northridge (2022).

[OP47] Botvinick, E.L., "Using light to establish and measure stiffness gradients in three-dimensional engineeredtissues", Univeristy of Minnesota (2022).

[OP46] Botvinick, E.L., "Transcutaneous multi-biomarker sensing on a single flexible fiber", Bioconvergence 2030, Israel (2022); seminar delivered by PhD student Toni Wilkinson due to scheduling conflict.

[OP45] Botvinick, E.L., "iGLOBE", The sugar Science, public seminar (2021)

[OP44] Botvinick, E.L, "iGLOBE", The Savvy Diabetic, public seminar (2021)

[OP43] Botvinick, E.L, Novel continuous monitoring in type 1 diabetes, UC Irvine Stem Cell Center public lecture, UCI (2020)

[OP42] Botvinick, E.L, "**Leveraging Nobel Laureate Arthur Ashkin's discovery of optical tweezers to probe the cell-tissue interface", Department of Biomedical Engineering, UCD (2019)**

[OP41] Botvinick, E.L., "Examination of pericellular stiffness in 3D culture", Department of Mechanical Engineering, UCSB (2017)

[OP40] Botvinick, E.L., "μTsunamis", IEEE EMBS Micro and Nanotechnology in Medicine Conference, Waikoloa, Hawaii (2016)

[OP39] Botvinick, E.L., "Feeling pericellular mechanical heterogeneities", Viterbi Department of Biomedical Engineering, USC (November 2016)

[OP38] Botvinick, E.L., "Accelerating biomedical innovation at the University of California, Irvine", Tskuba University Global Science Week, Tskuba, Japan (2016)

[OP37] Botvinick, E.L., "Feeling pericellular mechanical heterogeneities", Department of Biomedical Engineering, Cornell University (April 2015)

[OP36] Botvinick, E.L., "Mapping mechanical properties of the extra cellular matrix surrounding cells cultured in 3D", Trends in optical micromanipulation III (Optical Society of America), Obergurgl, Austria (2015)

[OP35] Botvinick, E.L., "Optical characterization of pericellular mechanical heterogeneity", Frontiers in Optics (Optical Society of America), San Jose, (2015)

[OP34] Botvinick, E.L., "Mapping mechanical properties of the extracellular matrix surrounding cells cultured in 3D", BMES session at the FASEB annual meeting, San Diego, 2014.

[OP33] Botvinick, E.L., "Mapping mechanical properties of the extracellular matrix surrounding cells cultured in 3D", Annual Meeting of the Biophysical Society, San Francisco, 2014

[OP31] Botvinick, E.L., "A method for high-throughput screening of cellular mechanotransduction using laser microbeam generated cavitation bubbles", Quadrennial World Congress of Biomechanics, Boston, 2014

[OP31] Botvinick, E.L., "Biophotonics from single molecules to medical devices", Annual meeting of BLI Korea, Seoul Korea, 2014

[OP30] Botvinick, E.L., "Laser Microbeams in the Study of Mechanobiology", Laurence-Berkeley National Laboratory, Berkeley, CA (Mar 18, 2013)

[OP29] Botvinick, E.L., "Photons, mechanobiology and the cardiovascular system ", Wallace H Coulter Department of Biomedical Engineering, Georgia Tech (Mar 4, 2013)

[OP28] Botvinick, E.L., "Laser Microbeams in the Study of Mechanobiology", Wallace H Coulter Department of Biomedical Engineering, Georgia Tech (Oct 23, 2012)

[OP27] Botvinick, E. L., Gordon Research Conferences: Signal Transduction by Engineered Extracellular Matrices, "Physical Measurement and Modulation of Stiffness in 3D," GRC. (July 11, 2012).

[OP26] Botvinick, E. L., Imaging at Illinois Conference, "Optical tweezers in the study of mechanobiology," UIUC. (June 1, 2012).

[OP25] Botvinick, E. L., "Optical Tweezers in the Study of Mechanobiology," Lawrence Berkeley National Laboratory. (May 8, 2012).

[OP24] Botvinick, E. L., Biomolecular Engineering Department, "Optical Tweezers in the Study of Mechanobiology," UC Santa Cruz. (March 8, 2012).

[OP23] Botvinick, E. L., Mechanics in biology: From single molecules to tissues, "Mechanically Induced Signaling in Cells," Institute for Complex Adaptive Matter. (January 5, 2012).

[OP22] Botvinick, E. L., Sue and Bill Gross Stem Cell Research Center Stem Cell Research Symposium, "Asking Mechanical Questions in Naturally Derived 3D Extracellular Matrices." (October 7, 2011).

[OP21] Botvinick, E. L., UC Davis NSF Center for Biophotonics Seminar, "Studying vascular mechanobiology with biophotonic tools.," Sacramento, CA. (April 12, 2011).

[OP20] Botvinick, E. L., Spring Optics and Photonics Congress, "Concentration independent modulation of local micromechanics in a fibrin clot," Optical Society of America, Panel: Optical Trapping Applications, Monterey, CA. (April 4, 2011).

[OP19] Botvinick, E. L., UCI CCBS Annual Retreat, "Beam me down," Pasadena, CA. (March 27, 2011)

[OP18] Botvinick, E. L., University of Michigan BME Departmental Seminar, "Biophotonic tools for the study of vascular mechanobiology," Ann Arbor, MI. (April 28, 2010).

[OP17] Botvinick, E. L., UCSD BME Departmental Seminar, "Biophotonic tools for the study of vascular mechanobiology," La Jolla, CA. (April 23, 2010).

[OP16] Botvinick, E. L., Spring Optics and Photonics Congress, "Microrheology of the endothelial glycocalyx and extracellular matrix," Optical Society of America, Panel: Optical Trapping Applications, Vancouver, Canada. (April 30, 2009).

[OP15] Botvinick, E. L., SPIE Photonics West 2009, "Endothelial cell mechanotransduction: using laser tweezers to differentiate between the transduction of ligand-coupled and fluid-coupled stresses," Panel: Photo Physical and Biochemical Properties of FPs, San Jose, CA. (January, 25, 2009).

[OP14] Botvinick, E. L., Lasers & Electro-Optics Society (LEOS), "Laser Manipulation of Cells and Tissue," IEEE, Panel: Biophotonics, Newport Beach, CA. (November 10, 2008).

[OP13] Botvinick, E. L., Annual meeting of the Biomedical Engineering Society, "Endothelial cell signaling in response to flow fields applied to subregions of the cell surface," St. Louis, MO. (October 2, 2008).

[OP12] Botvinick, E. L., ARC/NHMRC Research Network Workshop, "Laser Microbeams in the study of cellular mechanics, cell energetics, and mechano signaling," Fluorescence Applications in Biotechnology and Life Sciences (FABLS), University of Queensland, Australia. Invited Talk. (2007).

[OP11] Botvinick, E. L., Optical Society of America UC Irvine Chapter "Frontiers in Photonics" lecture series. Invited Talk. (2007).

[OP10] Botvinick, E. L., Sixteenth Cytometry Development Workshop: Technologies for Cell Analysis, Pacific Grove, California. Oral Presentations, Various topics. (2007).

[OP9] Botvinick, E. L., SPIE Optics and Photonics 2007, "A laser microscope system for mechanotransduction studies on cells," SPIE, San Diego. Presentation. (2007).

[OP8] Botvinick, E. L., UC Irvine CCBS/MCB/MCSB Retreat 2007, "Mechanobiology Laboratory." Invited Talk. (2007).

[OP7] Wakida, N., Xu, J., Shi, L., Botvinick, E. L., Dvornikov, A., Berns, M., Bourne, H., Annual meeting of the American Society of Cell Biology, "Centrosome Ablation in Neutrophils Affects Cell Polarity and Migration," San Diego, CA. Poster Presentation. (2006).

[OP6] Baker, M., Wu, G., Shi, L., Botvinick, E. L., Berns, M. W., Annual meeting of the American Society of Cell Biology, "Laser Ablation of Mitotic Spindle in Anaphase Can Prevent Progression to Cytokinesis," San Diego. Poster Presentation. (2006).

[OP5] Botvinick, E. L., Department of Biomedical Engineering CAB meeting. Invited Talk. (2006).

[OP4] Botvinick, E. L., Fifteenth Cytometry Development Workshop: Technologies for Cell Analysis, Pacific Grove, California. Oral Presentations, Various topics. (2006).

[OP3] Botvinick, E. L., Rubinsztein-Dunlop, H., Berns, M. W., "Probing the Fluid Environment at and Near the Cell Surface by Rotating Laser Trapped Microspheres," American Society of Cell Biology, San Diego. Poster Presentation. (2006).

[OP2] Botvinick, E. L., SPIE 2006, Optical Trapping and Optical Micromanipulation III, "Laser Tweezers: Applying Ultra-Localized stresses to the cell surface in the study of Mechanotransduction." Session Chairs: Dholakia K and Spalding GC. Oral Presentation. (2006).

[OP1] Botvinick, E. L., Knoner, G., Rubinsztein-Dunlop, H., SPIE Optics and Photonics 2006, "Ultra-localized flow fields applied to the cell surface." Oral Presentation. (2006).

PATENTS

[P11] Thorson, T.J., Mohraz, A., Botvinick, E.L., "Self-assemply derived co-continuous polymers for biomedical devices" (Provisional application: 2017)

[P10] Botvinick, E.L, Shreim, S., Djalilian, H., White, S., Weidling, J., "System and method for diagnosing health conditions through light measurements" (Provisional application: 2017)

[P9] Botvinick E.L., Weidling, J., White, S. "Continuous Analyte Sensor", (National phase in multiple countries PCT/US2015/044063: 2016-17).

[P8] Botvinick, E.L, Weidling, J., "Measuring oxygen levels in an implant, and implants having incorporated oxygen sensing" (Regular application US 14/739,912: June 2015)

[P7] Botvinick, E. L., Shreim, S, Kotlarchyk, M. Patent."Concentration independent modulation of local micromechanics in a fibrin gel" (Issued 13/457,342: 2014).

[P6] Botvinick E.L, Venugopalan, V, Compton J. Patent. "Mechanical stress response analysis of cells and tissues" (Regular application 14/046,804: 2013).

[P5] Botvinick, E. L., Lakey, J. R. T., George, S. C., Shergill, B., Patent, "Two Phase Approach to Islet Transplantation" (Regular application ", US 61/632,805: 2012)

[P4] Berns, M. W., Botvinick, E. L., Patent, " Systems and methods for identifying and disrupting cellular organelles" (Regular application 13/234,986: September 16, 2011).

[P3] Berns, M. W., Pederson, T., Botvinick, E. L., Shi, L. Z., Patent, "Systems and Methods for Identifying and Disrupting Cellular Organelles" (Regular application US 2012/0129158 A1: September 16, 2011).

[P2] Botvinick, E. L., Berns, M. W., Rappaport, C., Patent, "Microscope immersion fluid applicator", (Issued US 11/425,336: 2009).

[P1] Botvinick, E. L., Bremer, T., Patent, "Implantable biosensor and methods of use thereof" (ISSUED US60/531,447: October 26, 2006).

CLINICAL RESEARCH

[CR2] "Tissue and blood lactate changes during exercise". This is an open label pilot study to compare blood lactate concentrations to that in the subcutaneous tissue as assayed by my laboratories continuous lactate monitor. (Status: ongoing study)

[CR1] "Evaluation of middle ear infection". This is an open label pilot study to test our technology for detecting ear infections in children under the age of 7. (Status: ongoing study)

COURSES TAUGHT (inverse chronological order, all taught at UCI)

[C37] BME 195 Tissue Spectroscopy (undergraduate), Fall 2022, Winter and Spring 2023
[C36] BME 110B Biomechanics II (undergraduate), Winter 2023
[C35] BME 110B Biomechanics II (undergraduate), Winter 2022
[C34] BME 50B Cellular and Molecular Engineering (undergraduate), Spring 2021
[C33] BME 50B Cellular and Molecular Engineering (undergraduate), Spring 2020
[C32] BME 50B Cellular and Molecular Engineering (undergraduate), Spring 2019
[C31] BME 50B Cellular and Molecular Engineering (undergraduate), Spring 2018
3.55/4.00 (mean), 4.00/4.00 (median)
[C30] BME 60A EAD: Data Acquisition (undergraduate), Fall 2018, Instructor Evaluation:
3.71/4.00 (mean), 4.00/4.00 (median)
[C29] BME 60A EAD: Data Acquisition (undergraduate), Fall 2017, Instructor Evaluation:
3.95/4.00 (mean), 4.00/4.00 (median)
[C28] BME 60A EAD: Data Acquisition (undergraduate), Fall 2015, Instructor Evaluation:
3.84/4.00 (mean), 4.00/4.00 (median)
[C27] BME 60A EAD: Data Acquisition (undergraduate), Fall 2014, Instructor Evaluation:
3.75/4.00 (mean), 4.00/4.00 (median)
[C26] BME 60A EAD: Data Acquisition (undergraduate), Fall 2013, Instructor Evaluation:
3.60/4.00 (mean), 4.00/4.00 (median)
[C25] BME 195 Hands on BME (undergraduate), Spring 2013, Instructor Evaluation:
3.90/4.00 (mean), 4.00/4.00 (median)
[C24] BME 195 Hands on BME (undergraduate), Winter 2013, Instructor Evaluation:
3.30/4.00 (mean), 3.30/4.00 (median); note: only 2 respondents of 11.
[C23] BME 110A Biomechanics (undergraduate), Fall 2012, Instructor Evaluation:
3.50/4.00 (mean), 3.70/4.00 (median)
[C22] BME 195 Hands on BME, (undergraduate), Fall 2012, Instructor Evaluation:
3.94/4.00 (mean), 4.00/4.00 (median)
[C21] BME 195 Engineering for Rehabilitation, (undergraduate), Spring 2012, Instructor Evaluation:
3.93/4.00 (mean), 4.00/4.00 (median)
[C20] BME 197 Seminar in Biomedical Engineering, (undergraduate), Spring 2012, Instructor Evaluation:
3.93/4.00 (mean), 4.00/4.00 (median)
[C19] BME 298 Seminar in Biomedical Engineering, (graduate), Spring 2012, Instructor Evaluation:
3.82/4.00 (mean), 4.00/4.00 (median)
[C18] BME 195 Engineering for Rehabilitation, (undergraduate), Winter 2012, Instructor Evaluation:
3.95/4.00 (mean), 4.00/4.00 (median)

[C17] BME 197 Seminar in Biomedical Engineering, (undergraduate), Winter 2012, Instructor Evaluation:
3.67/4.00 (mean), 4.00/4.00 (median)
[C16] BME 298 Seminar in Biomedical Engineering, (graduate), Winter 2012, Instructor Evaluation:
3.70/4.00 (mean), 4.00/4.00 (median)
[C15] BME 110A Biomechanics I, (undergraduate), Fall 2011, Instructor Evaluation:
3.81/4.00 (mean), 4.00/4.00 (median)
[C14] BME 197 Seminar in Biomedical Engineering, (undergraduate), Fall 2011, Instructor Evaluation:
3.92/4.00 (mean), 4.00/4.00 (median)
[C13] BME 298 Seminar in Biomedical Engineering, (graduate), Fall 2011, Instructor Evaluation:
3.87/4.00 (mean), 4.00/4.00 (median)
[C12] BME 298 Seminar in Biomedical Engineering, (graduate), Spring 2011, Instructor Evaluation:
3.57/4.00 (mean), 4.00/4.00 (median)
[C11] BME 298 Seminar in Biomedical Engineering, (graduate), Winter 2011, Instructor Evaluation:
3.85/4.00 (mean), 4.00/4.00 (median)
[C10] BME 110A Biomechanics I, (undergraduate), Fall 2010, Instructor Evaluation:
3.53/4.00 (mean), 3.70/4.00 (median)
[C9] BME 197 Seminar in Biomedical Engineering, (undergraduate), Fall 2010, Instructor Evaluation:
3.00/4.00 (mean), 3.00/4.00 (median)
[C8] BME 298 Seminar in Biomedical Engineering, (graduate), Fall 2010, Instructor Evaluation:
3.65/4.00 (mean), 4.00/4.00 (median)
[C7] BME 195 Quantitative Image Analysis, (undergraduate), Spring 2010, Instructor Evaluation:
3.85/4.00 (mean), 3.85/4.00 (median)
[C6] BME 295 Quantitative Image Analysis, (graduate), Spring 2010, Instructor Evaluation:
---/4.00 (mean), ---/4.00 (median)
[C5] BME 110A Biomechanics I, (undergraduate), Fall 2009, Instructor Evaluation:
3.48/4.00 (mean), 3.70/4.00 (median)
[C4] BME 50A Cell Molecular Engineering, (undergraduate), Winter 2009, Instructor Evaluation:
3.44/4.00 (mean), 3.70/4.00 (median)
[C3] BME 195 Quantifying Images, (undergraduate), Fall 2008, Instructor Evaluation:
4.00/4.00 (mean), 4.00/4.00 (median)
[C2] BME 295 Quantifying Images, (graduate), Fall 2008, Instructor Evaluation:
4.00/4.00 (mean), 4.00/4.00 (median)
[C1] BME 50A Cell Molecular Engineering, (undergraduate), Winter 2008, Instructor Evaluation:
3.62/3.70 (mean), x.xx/4.00 (median)

UNIVERSITY SERVICE

Department of Biomedical Engineering

- Associate director for Edwards Lifesciences Center for Advanced Cardiovascular Technology
- Search committee for the Edwards Lifesciences Center for Advanced Cardiovascular Technology Director.
- Chair of graduate admission for The Department of Biomedical Engineering, 2013
- Member, BioENGINE Masters of Engineering Planning Committee, July 21, 2011 - present
- Course Coordinator: BME110 series, September 1, 2010 - 2013
- Advisor, Biomedical Engineering Society, Student Chapter, 2009 - 2015
- Member, Faculty Search Committees; various, 2009 – Present
- Planning and building a new professional degree for UCI's BME department, 2013 - present
- Member, Working Group for the Future Vision of Undergraduate Education in the HSSOE, 2009
- Frequent ad-hoc member, Undergraduate education/program/curriculum working group,

2007 - present
- Member, Retreat Committee, Department of Biomedical Engineering, 2007 - 2011
- Undergraduate exit survey. Working with Prof Bernard Choi, we surveyed undergraduates whorecently completed our curriculum to gain feedback for course improvement and ABETcompliance, 2007 - 2010
- Course Coordinator, Biomechanics A, B, Department of Biomedical Engineering, 2007 - 2008

Beckman Laser Institute and Medical Clinic

- Information Technologies Committee, Beckman Laser Institute, 2007 - Present
- Co-Director, MMP Core, LAMMP, Beckman Laser Institute, 2007 - Present

School of Medicine

- Member, Promotions and Honors Committee for the School of Medicine, 2010 - 2016
- Member, Medical Scientist Training Program admissions committee, 2009 - 2013

System Wide

- UCI site lead for the University of California Center for Accelerated Innovation (UC CAI).
- Organizer, innovator, and chair, of UC Irvine Biomedical Pitch Day, sponsored by NHLBI, and UC BRAID, and the ICTS.

Other

- Member of Search Committee for executive director of the UC Irvine Institute for Innovation (2014
- Search committees for the BME department and the ELCACT, 2014 - present
- UCI Site leader and Director for the NIH HLBI University of California Center for Advanced Innovation: Medical Device Panel, 2014 - present