



JULEA VLASSAKIS

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EDUCATION

08/2012-present	University of California, Berkeley/San Francisco Doctor of Philosophy, Bioengineering National Science Foundation Graduate Research Fellow Advisor: Dr. Amy E. Herr Anticipated date of PhD conferral: May 2018	<i>Berkeley, CA</i>
09/2008-05/2012	Smith College Bachelor of Arts in Chemistry (Highest Honors) and Physics Advisors: Dr. Kate Queeney (chemistry) and Dr. Nalini Easwar (Physics)	<i>Northampton, MA</i>

RESEARCH EXPERIENCE

2013-present	PhD Research, University of California, Berkeley Department of Bioengineering Advisor: Dr. Amy E. Herr <ul style="list-style-type: none">Designed in-gel immunoassays and single cell electrophoretic separations of proteins for the study of cellular heterogeneity in diseases such as cancerCultivated collaborations with Dr. Higuchi-Sanabria and Dr. Dillin in the Department of Molecular and Cell Biology at UC Berkeley to explore the effect of heat shock on actin complexes at the single-cell level This work resulted in publications in <i>Nature Protocols</i> , <i>Nature Communications</i> , and <i>Analytical Chemistry</i> , and oral presentations at the GRS on Microfluidics, MicroTAS 2017 (scheduled), and SLAS 2018 (scheduled). One manuscript is under revision at <i>Analytical Chemistry</i> . This research was supported by an NSF Graduate Research Fellowship (\$134,000) and a Matilda Edlund Fellowship (\$10,000). My proposal for the design of single-cell actin complex separations earned a Society for Laboratory Automation and Screening Graduate Education Grant (\$100,000; 1 awarded out of 21 proposals from 3 different countries).	<i>Berkeley, CA</i>
2007-2012	Undergraduate Research, Harvard University Department of Physics Advisor: Dr. Mara Prentiss <ul style="list-style-type: none">Demonstrated that DNA mechanical properties are altered in the presence of specific monovalent cations, and DNA repair protein complexes utilizing optical and magnetic tweezersElucidated the role of tension in driving accurate DNA pairing during strand exchange-based DNA repair with mechanical models This work resulted in publications in <i>JACS</i> , <i>Physical Review E and Nucleic Acids Research</i> , including two first-author publications.	<i>Cambridge, MA</i>

FELLOWSHIPS

2017-2018	SLAS Graduate Education Fellowship Grant Role: Graduate Researcher
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2013-2016	\$100,000 NSF Graduate Research Fellowship Role: Graduate Researcher
2012-2013	\$134,000 Matilda Edlund Fellowship, UCSF Role: Graduate Researcher
	\$10,000

AWARDS AND HONORS

2016	UC Berkeley Summer Institute for Preparing Future Faculty Fellow
2014	Lindau Meeting of Nobel Laureates: Medicine and Physiology (selected to attend as a young researcher)
2012	The C. Pauline Burt Prize, Chemistry Department The Adelaide W. Bull Paganelli Prize, Physics Department The Frank A. Waterman Prize, Physics Department First Group Scholar (GPA in top 10% of class)
2008-2012	Dean's List
2008-2012	STRIDE Scholar

PEER REVIEWED JOURNAL ARTICLES

Journal Articles (in print)

1. E. Sinkala, E. Sollier-Christen, C. Renier, E. Rosas-Canyelles, J. Che, K. Heirich, T.A. Duncombe, **J. Vlassakis**, K.A. Yamauchi, H. Huang, S. S. Jeffrey, and A.E. Herr. Profiling protein expression in circulating tumour cells using microfluidic western blotting (2017) *Nat. Comm.* **8**, 14622.
2. C. Kang, K. A. Yamauchi*, **J. Vlassakis***, E. Sinkala, T.A. Duncombe and A. E. Herr. Single-cell resolution western blotting (2016) *Nat. Prot.* **11**, 1508-1530. (*contributed equally to this study)
3. **J. Vlassakis** and A.E. Herr. Effect of polymer hydration state on in-gel immunoassays (2015) *Anal. Chem.* **87**, 11030-11038.
4. C. Danilowicz, A. Peacock-Villada, **J. Vlassakis**, A. Facon, E. Feinstein, N. Kleckner and M. Prentiss. The differential extension in dsDNA bound to Rad51 filaments may play important roles in homology recognition and strand exchange (2014) *Nucl. Acids Res.* **42**, 526-533.
5. **J. Vlassakis**, E. Feinstein, D. Ying, A. Tilloy, D. Weiller, J. Kates-Harbeck, V. Coljee and M. Prentiss. Tension on dsDNA bound to ssDNA-RecA filaments may play an important role in driving efficient and accurate homology recognition and strand exchange (2013) *Phys. Rev. E*, **87**, 032702.
6. C. Danilowicz, E. Feinstein, A. Conover, V.W. Coljee, **J. Vlassakis**, Y. Chan, D.K. Bishop, and M. Prentiss. RecA Homology Search is Promoted by Mechanical Stress Along the Scanned Duplex DNA (2011) *Nucl. Acids Res.* **40**, 1717-1727.
7. **J. Vlassakis**, J. Williams, K. Hatch, C. Danilowicz, V.W. Coljee, and M. Prentiss. Probing the Mechanical Stability of DNA in the Presence of Monovalent Cations (2008) *J. Am. Chem. Soc.* **130**, 5004-5005.

Journal Articles (submitted)

8. **J. Vlassakis** and A.E. Herr. Joule heating-induced dispersion in electrophoretic cytometry. (*in revision at Analytical Chemistry*)

Journal articles (in preparation)

9. **Vlassakis, J.**, Higuchi-Sanabria, R., Dillin, A., and Herr, A.E. Electrophoretic cytometry fractionates cytoskeletal protein complexes from single cells (*in preparation*).
10. **Vlassakis, J.**, Gumuscu, B., and Herr, A.E. Chemically activatable hydrogels for electrophoretic cytometry isoform separations (*in preparation*).

11. Chan, P., **Vlassakis, J.**, Kim, J.J., and Herr, A.E. Microparticle delivery of protein sizing standards for electrophoretic cytometry (*in preparation*).
12. Goossens, E. T., **Vlassakis, J.**, Gopal, A., Herr, A.E., and Doerge, R.W. A semi-supervised framework for classification and segmentation of electrophoretic cytometry images (*in preparation*).

PATENTS

1. A.E. Herr, et. al., "Electrophoresis devices and methods for making and using the same." US Patent #No. US2014021399.

PRESENTATIONS

Oral Presentations

1. Society for Laboratory Automation and Screening (SLAS) Annual Meeting 2018, San Diego, CA, "Electrophoretic Cytometry Isolates Cytoskeleton Molecular Complexes of Single Cancer Cells" (February, 2018)
2. 21st International Conference on Miniaturized Systems for Chemistry and Life Sciences (MicroTAS), Savannah, GA, "Electrophoretic cytometry reveals heterogeneity in cytoskeletal molecular states of cancer cells" (October, 2017)
3. UC Berkeley/UCSF Joint Graduate Group in Bioengineering Retreat, Tahoe City, CA, "Electrophoretic cytometry fractionates cytoskeletal protein complexes from single cells" (*Invited talk, 2017*)
4. UC Berkeley/UCSF Joint Graduate Group in Bioengineering Retreat, Asilomar, CA, "Effect of polymer hydration state on in-gel immunoassays." (*Invited talk, 2015*)
5. Gordon Research Seminar, Physics and Chemistry of Microfluidics, Mt. Snow, VT, "Hydrogel Swelling as an Efficient Mechanism for Antibody Probing of Single Cell Western Blots" (2015)
6. ACS 248th National Meeting, San Francisco, CA, "Global science capacity building and the Maker Movement: Do-it-yourself lab equipment with Tekla Labs" (*Invited Talk, 2014*)
7. AAAS Annual Meeting, Chicago, IL, "BuildMyLab: The Tekla Labs Approach to Increasing Science Capacity Worldwide" (*Invited Talk, 2014*)
8. Smith College Chemistry Department Honors Thesis Presentation, Northampton, MA, "Accuracy of DNA Pairing by the RecA Protein: Proof of Concept for a RecA Gene Chip" (May, 2012)
9. ACS CVS Undergraduate Research Symposium, New London, CT, "Accuracy of DNA Pairing by the RecA Protein: Proof of Concept for a RecA Gene Chip" (2012)
10. Smith College Chemistry Department Seminar, Northampton, MA, "Microfluidic Arts and Crafts: Paper and Tape Biodiagnostics" (2011)

Poster Presentations

1. **J. Vlassakis** and A. E. Herr. Joule heating-induced dispersion in electrophoretic cytometry. UC Berkeley/UCSF Joint Graduate Group in Bioengineering Retreat, Tahoe City, CA.
2. **J. Vlassakis** and A. E. Herr. Single-cell separations of proteins with small molecular weight differences. Gordon Research Conference, Physics and Chemistry of Microfluidics 2017, Barga, Italy.
3. **J. Vlassakis**, and A.E. Herr. Quantitative Separations of Actin Species in Single Cells. UC Berkeley/UCSF Joint Graduate Group in Bioengineering Retreat, Sonoma CA. (*Poster Award Winner*)
4. **J. Vlassakis**, and A.E. Herr. Hydrogel Swelling as an Efficient Mechanism for Antibody Probing of Single Cell Western Blots. Gordon Research Conference, Physics and Chemistry of Microfluidics 2015, Mt. Snow, VT.
5. **J. Vlassakis**, A. Peacock-Villada, C. Danilowicz, E. Feinstein, V. W. Coljee, and M. Prentiss. Applying force to duplex DNA yields different responses in Rad51 and RecA homology search processes. 2012 Workshop on DNA Reactions and DNA/Chromosome Dynamics, Woods Hole, MA. (presented by C. Danilowicz)

6. **J. Vlassakis**, S. Tyle, T. Crawford, J. Williams, J. Weeks, T. Kodger, E. Feinstein, C. Danilowicz, V.W. Coljee, and M. Prentiss. An Optical Tweezers Study of Nanosecond Duration DNA Conformations Through DNA-Surface Binding Measurements. SPIE Optics and Photonics 2010, San Diego, CA. Optical Trapping and Optical Micromanipulation Session
7. **J. Vlassakis**, C. Danilowicz, K. Queeney and M. Prentiss, Accuracy of DNA Pairing by the RecA Protein: Proof of Concept for a RecA Gene Chip (2012) Celebrating Collaborations, Smith College, Northampton, MA
8. C. Santarossa, C. Say, **J. Vlassakis** and K. Queeney. Proteins with a Preference: The Role of Molecular Conformation in poly-L-lysine Adsorption and Biofilm Formation on Hydrophobic and Hydrophilic Silicon Surfaces (2010) Celebrating Collaborations, Smith College, Northampton, MA
9. C. Danilowicz, K. Hatch, C. Limouse, R. Gunaratne, **J. Vlassakis**, J. Williams, V.W. Coljee, and M. Prentiss. Manipulating Single dsDNA Molecules to Study Force Induced Phase Transitions (2009) *Biophysical J.*, 93.

LEADERSHIP AND OUTREACH

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| 2013-present | Ad Hoc Reviewer for Analytical Chemistry and Lab on a Chip
Performed peer review on submitted manuscripts |
| 05/2015-present | Student Organizing Committee Member, UC Berkeley Nanoscale Science and Engineering (NSE) Seminar Series
Responsible for inviting and hosting seminar speakers. |
| 06/2015-06/2017 | Co-chair of the Gordon Research Seminar (GRS) in Microfluidics
Elected by peers at the 2015 GRS in Microfluidics. Organizing the schedule, selected speakers and coordinated fundraising for the 2017 conference. Raised over \$10,000 from industry and academic sponsors. |
| 2015-2017 | UCSF-UC Berkeley Joint Graduate Group in Bioengineering Admissions Committee
Student member of the admissions committee responsible for review of applications to the PhD program. Attends admission committee meetings. |
| 2014-present | Herr Lab Safety Officer
Safety officer attends quarterly safety meetings, helps prepare lab for various safety inspections, provides safety training to new lab members and serves as a liaison between EH&S and the lab. |
| 2013-2014 | BEAST Social Committee
The UC Berkeley/UCSF Joint Graduate Group in Bioengineering's Association of Students (BEAST). Social committee organizes gatherings for students in the program. |
| 2012-present | Executive Director of Tekla Labs, UC Berkeley
Student-run non-profit organization that makes instructions for building lab equipment out of inexpensive components available to researchers in the developing world and science instructors in underfunded schools. |
| 2014 | Co-Organizer of the Diagnostics by Design (DxD) Hackathon, UC Berkeley
Organized a two-day hackathon with the CITRIS Invention Lab at UC Berkeley bringing together global health experts and engineers to design and prototype solutions to diagnostic and global health challenges. |

TEACHING AND INSTRUCTION

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| 06/2016, 7/2017 | Teaching Assistant, Cold Spring Harbor Lab
<i>Course: Single Cell Analysis</i> |
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Responsibilities: Developed curriculum, coordinated course logistics, presented lectures and led students through experimental procedures and analyses for the single-cell Western blotting module of the proteomics section of the course. Students (18 total) were postdoctoral researchers, graduate students and undergraduates from around the world.

01/2015-05/2015

Graduate Student Instructor, UC Berkeley

Course: Bioengineering 151/251 Micro/Nanofluidics for Bioengineering and Lab-on-a-Chip

Responsibilities: Prepared lectures and activities for weekly discussion section, held weekly office hours and assisted with problem set/exam grading. Students (30 total) were graduate students and undergraduates.

2010

Tutor, Smith College

Course: Physical Chemistry II

Responsibilities: Reviewed lecture materials and practice problems for upper division thermodynamics and kinetics one-on-one with an undergraduate chemistry major.

MENTORING

2013-present

Mentor to graduate students and undergraduates in the Herr lab

Provided research and fellowship application guidance to six rotation students during their 8-week experience, and graduate student researchers in the lab. Led a bi-weekly subgroup of two new graduate students and a postdoc for summer 2017.

Mentees:

Ms. Elaine Su, Graduate student (February 2016-present)

Current status: Graduate student, Herr Lab, UC Berkeley

Mr. Andoni, Mourdoukoutas, Graduate student (August 2017-present)

Current status: Graduate student, Herr Lab, UC Berkeley

Ms. Alisha Geldert, Graduate student (June 2017-present)

Current status: Graduate student, Herr Lab, UC Berkeley

Ms. Alison Su, Rotation student (January 2017-present)

Current status: Graduate student, Herr Lab, UC Berkeley

NSF Graduate Research Fellow (assisted with fellowship application)

Ms. Kristine Tan, Rotation student (March 2017-present)

Current status: Graduate student, Herr Lab, UC Berkeley

Ms. Callie Jerman, Rotation student (September-November 2015)

Current status: Freelance artist

Mr. Thomas Carey, Rotation student (March 2016-May 2016)

Current status: Graduate Student, Sohn Lab, UC Berkeley

Ms. Jinny Sun, Rotation Student (September-November 2014)

Current status: Graduate Student, Kurhanewicz Lab, UC Berkeley

NSF Graduate Research Fellow (assisted with fellowship application)

Mr. Hector Neira, Rotation Student (September 2013-present)

Current status: Graduate student, Herr Lab, UC Berkeley

Ford Foundation Fellow (assisted with fellowship application)

2015

UC Berkeley SMART Graduate Mentor Fellow

Mentored an undergraduate in chemical biology for the SMART Mentor Fellow Program on a project implementing protein signal amplification.

Mentee:

Mr. Sean Purcell, UC Berkeley Undergraduate (June 2015-May 2016)

2010-2012 Current Status: PhD Student, UC San Diego Chemical Biology
Mentor to New Members in Prentiss Lab
Introduced new members (one high school, three undergraduate and three visiting scholars) to research projects in lab including background, recent studies in lab and experimental techniques.

SKILLS AND TECHNIQUES

Microfabrication, single-cell Western blotting, microfluidic electrophoresis, single molecule biophysics, magnetic tweezers, DNA overstretching, optical tweezers, fluorescence spectroscopy, paper-based microfluidics, FRET, rheometry, FT-IR, UV-Visible Spectroscopy, gel electrophoresis, PCR, Mathematica, Matlab, Adobe Illustrator, LaTeX.

GRANTS AND FUNDING RECEIVED

2017 **UC Berkeley Graduate Assembly Travel Award**
Travel support to attend the MicroTAS meeting (2017)
2015, 2017 **OAI Travel Grant**
Travel support for the GRS/GRC in Microfluidics (2015) and MicroTAS meeting (2017)
2014 **Graduate Division Conference Travel Grant, UC Berkeley**
Travel support to the Lindau Meeting of Nobel Laureates
2013 **Big Ideas at Berkeley**
"Scaling up" category, 1st prize (\$10,000) for Tekla Labs
2011 **Tomlinson Memorial Fund, Smith College**
In support of chemistry thesis research.

PROFESSIONAL MEMBERSHIPS AND HONORS SOCIETIES

2017 **Biophysical Society (Student Member)**
2014 **The American Chemical Society (Student Member)**
2012 **Sigma Xi**
2011 **The American Physical Society (Student Member)**