



Department of Bioengineering
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Citizenship: USA

EDUCATION

08/2012-present	University of California, Berkeley Doctor of Philosophy, Bioengineering National Science Foundation Graduate Research Fellow Advisor: Dr. Amy Herr	<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>

UNDERGRADUATE ACADEMIC AWARDS

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

FELLOWSHIPS

2017-2018	SLAS Graduate Education Fellowship Grant
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)
2013-2016	NSF Graduate Research Fellowship
2012-2013	Matilda Edlund Fellowship, UCSF

PEER REVIEWED JOURNAL ARTICLES

Journal Articles and Reviewed Proceedings

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.
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.

PRESENTATIONS

Oral Presentations

1. UC Berkeley/UCSF Joint Graduate Group in Bioengineering Retreat, Asilomar, CA, "Effect of polymer hydration state on in-gel immunoassays." (*Invited talk, 2015*)

2. 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)
3. 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*)
4. AAAS Annual Meeting, Chicago, IL, “BuildMyLab: The Tekla Labs Approach to Increasing Science Capacity Worldwide” (*Invited Talk, 2014*)
5. 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)
6. 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)
7. 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. Quantitative Separations of Actin Species in Single Cells. UC Berkeley/UCSF Joint Graduate Group in Bioengineering Retreat, Sonoma CA. (*Poster Award Winner*)
2. **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.
3. **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)
4. **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
5. **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
6. 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
7. 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.

PATENT APPLICATIONS

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

LEADERSHIP AND OUTREACH

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-present	Co-chair of the Gordon Research Seminar (GRS) in Microfluidics (to be held in 2017) Elected by peers at the 2015 GRS in Microfluidics, and will be organizing the schedule, selecting speakers and working with the co-chairs of the Gordon Research Conference (GRC) to fundraise for the 2017 conference.
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.

MENTORING

2013-present **Mentor to rotation students and undergraduates in the Herr lab**
Provided research and fellowship application guidance to six rotation students during their 8-week experience in the lab.

2015 **UC Berkeley SMART Graduate Mentor Fellow**
Mentored an undergraduate in chemical biology starting summer 2015 (SMART Mentor Fellow Program) through spring 2016 on a project implementing protein signal amplification.

2010-2012 **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.

TEACHING AND INSTRUCTION

06/2016 **Teaching Assistant, Cold Spring Harbor Lab Single Cell Analysis Course**
Developing curriculum and leading students through experimental procedures and analyses for the single-cell Western blotting module of the proteomics section of the course.

01/2015-05/2015 **Graduate Student Instructor, Bioengineering 151/251 Micro/Nanofluidics for Bioengineering and Lab-on-a-Chip**
25% Teaching appointment with presentation of material in weekly discussion section, weekly office hours and problem set/exam grading.

2010 **Tutor to P-Chem Student, Smith College,**
Asked by student to provide outside help for Physical Chemistry II coursework (300-level thermodynamics and kinetics). Reviewed lecture materials and practice problems.

RESEARCH EXPERIENCE

2013-present **PhD Research, UC Berkeley/UCSF** *Berkeley, CA*
Advisor: Dr. Amy Herr, Bioengineering
In-gel single-cell protein measurements: We have worked on alternative methods for antibody introduction in hydrogel immunoassays, which may be extended to other diagnostic or drug delivery applications. Currently we are focusing on quantitative single-cell resolution assays of cytoskeletal health in aging and cancer applications.

2011-2012 **B.A. Research, Smith College** *Northampton MA*
Advisor: Dr. Kate Queeney, Chemistry
RecA DNA Pairing For Improved DNA Microarray Technology: Conducted fluorescence resonance energy transfer (FRET) assays with dsDNA and RecA-ssDNA filaments. Provided proof of concept of a RecA protein modified gene chip. Collaborated with Prentiss Lab (Harvard University). Received Tomlinson Memorial Funding (from Smith) in support of research. Presented findings in written thesis, chemistry department lunch seminar and in thesis defense.

2007-2012 **Prentiss Lab, Harvard University** *Cambridge, MA*
Advisor: Dr. Mara Prentiss, Physics
Studied DNA interactions with small molecules and proteins using single-molecule biophysical techniques such as magnetic and optical tweezers. Designed, ran and analyzed experiments elucidating single DNA-protein interactions during RecA/Rad51 mediated homologous recombination, single DNA-monovalent ion interactions/DNA-drug interactions, DNA rheological behavior, and DNA-surface binding interactions. Contributed to analytical model of mechanical stress in DNA during RecA-mediated strand exchange. Prepared first author and co-authored manuscripts, and a poster presentation.

- 2011 **Special Studies, Smith College** *Northampton, MA*
 Advisor: Dr. Kate Queeney, Chemistry
Biodiagnostics for Resource Poor Settings: Designed self-instructed course on paper microfluidic devices. Reviewed and replicated experiments in paper-based biodiagnostics utilizing photolithography. Prepared a literature review and presenting at chemistry department seminar.
- 2009-2010 **STRIDE Research, Smith College** *Northampton, MA*
 Advisor: Dr. Kate Queeney, Chemistry
 Studied effects of hydrophilic versus hydrophobic silicon surfaces on biofilm formation. Conducted FTIR experiments and presented results at poster session.

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

- 2015 **OAI Travel Grant**
 Travel support for the GRS/GRC in Microfluidics
- 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

- 2014 The American Chemical Society (Student Member)
- 2012 Sigma Xi
- 2011 The American Physical Society (Student Member)