

Louise L. Hansen

425.647.7725 ♦ louise_hansen@berkeley.edu

EDUCATION

- 08/2017 – Present **University of California, Berkeley/San Francisco**
Doctor of Philosophy, Bioengineering
Advisor: Prof. Amy E. Herr
Anticipated data of PhD conferral: Fall 2022
- 08/2013 – 06/2017 **University of Washington, Seattle**
B.S in Bioengineering (GPA: 3.76/4.0)
Concentration: Molecular and Materials
- Spring 2021 **Cold Spring Harbor Laboratory**
Postposed due to COVID-19
Quantitative Imaging: From Acquisition to Analysis
National Cancer Institute Award

RESEARCH EXPERIENCE

- 03/2018 – Present **Graduate Student Researcher**, *University of California, Berkeley*
Department of Bioengineering
Faculty advisor: Dr. Amy Herr
- Evaluate actin cytoskeletal integrity and heterogeneity with a microfluidic platform for the electrophoretic separation of dynamic structural proteins and protein complexes from single cell
 - Link cellular morphology to protein expression with on-chip cell culture by adherent cell device fabrication in the single-cell western blot platform
- 01/2018 – 03/2018 **Rotation Student**, *University of California, Berkeley*
Department of Bioengineering
Faculty mentor: Dr. Dan Fletcher
- Validated use of dither-based super-resolution image processing methods for implementation in the mobile microscopy platform (CellScope) to improve limit of detection.
- 09/2017 – 12/2017 **Rotation Student**, *University of California, Berkeley*
Department of Bioengineering
Faculty mentor: Dr. Lydia Sohn
- Designed a multiplexed antibody patterning method using DNA-anchoring on silicone substrate for surface receptor screening of cancer cells in the mechano-node-pore sensing platform.
- 06/2015 – 06/2017 **Undergraduate Researcher**, *University of Washington, Seattle*
Department of Bioengineering
Faculty advisor: Dr. Paul Yager
- Capstone Title: “*Development of a Competitive Inhibition Assay for Implementation in Fluorescence-based Point-of-Care Diagnostics*”
 - Awarded Mary Gates Research Scholarship (Fall 2015)
 - Designed a threshold-sensitive isothermal DNA amplification technique for semi-quantitative pathogen load readout of MRSA-positive samples using competitive inhibition.
 - Translated the assay into porous membranes with fluorescence-based readout for detection with smartphones in point-of-care diagnostic applications.
- 07/2014 – 04/2015 **Research Assistant**, *The Allen Institute for Brain Science, Seattle*

- Contributed to the ‘Allen Brain Atlas’ pipeline production with the creation of AAV viral tracers for retrograded circuit mapping between cell types in the visual cortex.
 - Investigated connectivity patterns and interregional cortical connections of *in vivo* studies to identify neuronal subtypes and their function.
- 07/2013 – 06/2014 **Research Assistant, Fred Hutchinson Cancer Research Center, Seattle**
Clinical Research Department
Mentor: Dr. Beverly Torok-Storb
- Collaborated with the Zheng Lab at the UW Bioengineering to fabricate *in vitro* microfluidic vessel environment for the study of cell migration in the bone marrow niche.
 - Explored the effect of varying matrix components on cocultured cells on cell trafficking patterns to elucidate their importance in hematopoiesis.
- 06/2012 – 08/2012 **Research Intern, Fred Hutchinson Cancer Research Center, Seattle**
Core Center for Excellence in Hematology
- Worked in the Clinical Research Department genotype tracking lab, which provides VNTR, PCR and LAM-PCR and other molecular technology to analyze genotypes.
 - Independently managed project aimed at achieving gene expression in cultured canine cells for the tracking of stem cell clones after transplantation.

ORAL PRESENTATIONS

- **L. Hansen**, *Looking at Proteins: Unruly cells and their machinery*. Popping the Science Bubble, February 2020, Berkeley Public Library, CA.
- **L. Hansen**, J. Vlassakis and A.E. Herr. *Micro-scale electrophoretic fractionation of dynamic structural protein complexes from single cells*. Gordon Seminar, Physics and Chemistry of Microfluidics 2019, Hong Kong, China.
- **L. Hansen** and P. Yager. *Development of a Competitive Inhibition Assay for Implementation in Fluorescence-based Point-of-Care Diagnostics: Part I*. Undergraduate Research Symposium, Session: Improving Health Care through New Diagnostic Tests and Bacterial Monitoring, 20 May 2016, University of Washington, WA.

POSTER PRESENTATIONS

- **L. Hansen**, J. Vlassakis and A.E. Herr. *Micro-scale electrophoretic fractionation of dynamic structural protein complexes from single cells*. UC Berkeley/UCSF Bioengineering Conference 2019, Santa Cruz, CA.
- **L. Hansen**, J. Vlassakis and A.E. Herr. *Micro-scale electrophoretic fractionation of dynamic structural protein complexes from single cells*. Gordon Research Conference, Physics and Chemistry of Microfluidics 2019, Hong Kong, China.
- **L. Hansen** and A.E. Herr. *Characterization of magnetophoretic mobility for improved cell settling in the single-cell western blot*. UC Berkeley/UCSF Bioengineering Conference 2018, Asilomar, CA. (poster award winner).
- **L. Hansen** and P. Yager. *Implementation of fluorescence-based detection methods for semi-quantitative pathogen evaluation in point-of-care diagnostics*. Undergraduate Research Symposium, 19 May 2017, University of Washington, WA.

AWARDS AND RECOGNITION

- Lloyd Scholar in Bioengineering Award. UC Berkeley Department of Bioengineering (Spring 2020)

- Students' Choice Poster Award at UC Berkeley/UCSF Bioengineering Conference 2018, Asilomar, CA. (Fall 2018)
- Mary Gates Research Scholarship. University of Washington (Fall 2015).

PATENTS AND PUBLICATIONS

- S. Kamal, S. Kumar, V. Singh, **L. Hansen**, E. Heiniger, J. Bishop, B Lutz, P. Yager. *Two-fluorophore mobile phone imaging of bplexed real-time NAATs overcomes optical artifacts in highly scattering porous media*. Analytical Chemistry 2020. Accepted.
- Yager, Paul, Joshua Bishop, Joshua Buser, **Louise Hansen**, Erin Heiniger, Enos Kline, and Sujatha Kumar. *Systems for Cell Lysis and Analyte Detection and Associated Methods*. Patent 62/253,607. 10 Nov. 2016.
- Daigle T, Tasic B, **Hansen L**, Harris J, Cetin A. Allen Institute for Brain Science, "Production and utilization of custom AAVs for the Next Generation Connectivity atlas and beyond." Internal publication. Allen Institute for Brain Science. 2014.

LEADERSHIP AND INVOLVEMENT

- Summer 2020 **Graduate Remote Instruction Innovation Fellows Program, UC Berkeley Graduate Division**
- Applied high-quality remote pedagogical approaches to the redesign of an undergraduate senior capstone course
- 2019 – present **Co-chair of the Gordon Research Seminar (GRS) in the Physics and Chemistry of Microfluidics**
- Elected by peers at the 2019 GRS in Microfluidics.
- Spring 2020 **UC Berkeley Master of Engineering (MEng) in Bioengineering Admissions Committee, UC Berkeley**
- Student member of the review committee responsible for evaluation of applications to the master's program.
- Spring 2019 **College of Engineering Student Relations Committee, UC Berkeley**
- Auditioned COE commencement speakers for the 2019 graduation ceremony.
- 2017 – present **Bay Area Students in Science (BASIS), UC Berkeley**
- Co-developed and taught a hands-on science lesson for elementary school students, titled "The Water Cycle" about water systems and water conservation in collaboration with a team of 4 graduate students.
 - Designed and taught engineering challenges for Cal Day about the science and physics of bubbles.
- 2017 – 2020 **BEAST Internal Networking Committee Member, UC Berkeley**
- Planned social events and networking opportunities for the bioengineering graduate programs.
 - Designed and coordinated program logo-wear.
- 2016 – 2017 **Undergraduate Research Leader, University of Washington**
- Partook in outreach in conjunction with the Undergraduate Research Program and shared experiences with other undergraduates.
 - Presented in 6 first-year interest groups and took part of multiple panel interviews.
- Spring 2016 & Winter 2017 **Undergraduate Grader, University of Washington**
Class: Introduction to Bioengineering, Department of Bioengineering
- Created and graded course assessments and quiz material to ensure students understood material and stayed on track.

- Coordinated lectures and class activities for 100 students with the teaching team.
 - Provided project and assignment feedback to increase student growth and learning.
- 2015 – 2017 **Hoffman House Leader**, *University of Washington, Department of Bioengineering*
- Facilitated group of 50 undergraduate students in the bioengineering department aimed at strengthening the inter-department relations, guidance and extracurricular bonding.
 - Facilitated communication with the executive board and involved faculty members.
- 2015 – 2017 **Peer-Mentor**, *University of Washington, College of Engineering*
- Counseled undergraduates on engineering programs, application procedures, scholarships and research.
 - Participated in group outreach to approximately 400 incoming freshmen.