(updated November 3, 2022)

MELINDA LIU PERKINS
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EDUCATION

2020	**Ph.D. in Electrical Engineering**, University of California, Berkeley (Berkeley, CA) **Dissertation**: Biological patterning in networks of interacting cells **Advisor**: Murat Arcak
2015	**B.S. in Electrical Engineering** with Honors, Stanford University (Stanford, CA) Emphasis in Signal Processing, Minor in Biology **Honors Thesis**: Acoustic inteference between echolocation calls of two species of California bat **Advisors**: Elizabeth Hadly and John Pauly

PROFESSIONAL EXPERIENCE

2020 - present	**Postdoctoral Fellow**, European Molecular Biology Laboratory (Heidelberg, Germany) **Groups**: Justin Crocker (host), Developmental Biology Unit and Eileen Furlong (partner), Genome Biology Unit **Research focus**: experimental and theoretical analysis of gene expression dynamics in synthetic biological networks

AWARDS AND GRANTS

2020	**EMBL Interdisciplinary Postdoc (EIPOD4) Fellowship**, European Molecular Biology Laboratory co-funded by Marie-Skłodowska Curie Actions, stipend support for three years of postdoctoral work
2020	**Leon O. Chua Award**, Department of Electrical Engineering and Computer Sciences, University of California, Berkeley, presented annually to one recipient for outstanding achievement in nonlinear science from any discipline
2015	**Berkeley Fellowship for Graduate Study**, University of California, Berkeley, graduate tuition and stipend support for two years of Ph.D. study
2015	**Excellence Award** ($5000), Department of Electrical Engineering and Computer Sciences, University of California, Berkeley
2015	**Frederick E. Terman Award for Scholastic Achievement in Engineering**, Stanford University, granted to the top 5% of seniors (by GPA) in the School of Engineering
2015	Hertz Fellowship Finalist, Fannie and John Hertz Foundation
2014	Undergraduate Advising and Research Major Grant ($6000) for honors thesis research, Stanford University

PUBLICATIONS

2022 J. Zhao*, **M. L. Perkins***, M. Norstad, and H. G. Garcia (under review) "A bistable autoregulatory module in the developing embryo commits cells to binary fates." bioRxiv: https://www.biorxiv.org/content/10.1101/2022.10.31.514335v1
*contributed equally

2022 **M. L. Perkins**, L. Gandara, and J. Crocker (2022) "A synthetic synthesis to explore animal evolution and development." *Philos. Trans. R Soc. Lond., B, Biol. Sci.* 377(1855): 20200517. doi:10.1098/rstb.2020.0517

2021 **M. L. Perkins** (2021) "Implications of diffusion and time-varying morphogen gradients for the dynamic positioning and precision of bistable gene expression boundaries." *PLOS Comp. Biol.* 17(6): e1008589. doi:10.1371/journal.pcbi.1008589

2020 **M. L. Perkins**, D. Benzinger, M. Arcak, and M. Khammash (2020) "Cell-in-the-loop pattern formation with optogenetically emulated cell-to-cell signaling." *Nat. Commun.* 11(1): 1355. doi:10.1038/s41467-020-15166-3

2019 **M. L. Perkins** and M. Arcak (2019) "A spatial filtering approach to biological patterning." *SIAM J. Appl. Dyn. Syst.* 18(3): 1694-1721. doi:10.1137/18M1216092

2019 M. Tei*, **M. L. Perkins***, J. Hsia, M. Arcak, and A. P. Arkin (2019) "Designing spatially distributed gene regulatory networks to elicit contrasting patterns." *ACS Synth. Biol.* 8(1): 119-126. doi:10.1021/acssynbio.8b00377
*contributed equally

2018 **M. L. Perkins** and M. Arcak (2018, June) "Discrete spatial filtering by networks of cells facilitates biological pattern formation." *Proc. Am. Control Conf.*, Milwaukee, WI, USA. doi:10.23919/acc.2018.8431143

2017 **M. L. Perkins**, H. K. Frank, J. M. Pauly, and E. A. Hadly (2017) "Frequency shifting reduces but does not eliminate acoustic interference between echolocating bats: a theoretical analysis." *J. Acoust. Soc. Am.* 142(4): 2133-2142. doi:10.1121/1.5006928

PUBLISHED ABSTRACTS AND PRESENTATIONS

2022 J. Zhao*, **M. L. Perkins***†, J. Bothma, H. Garcia (2022, June) "An autoregulatory latch in the developing embryo commits cells to binary fates." Poster presentation at *Future of the Physics of Life*, Amsterdam, Netherlands.
*contributed equally, †presenting author

2020 **M. L. Perkins** (2020, November) "Dynamic positioning and precision of bistable gene expression boundaries." Micro-talk at *Annual Conference on Quantitative Approaches in Biology*, Evanston, Illinois (virtual).

2019 **M. L. Perkins**, D. Benzinger, M. Rullan, M. Arcak, and M. Khammash (2019, March) "Optogenetically simulated lateral inhibition generates contrasting patterns of gene expression." Poster session and flash talk at *EMBO | EMBL Syposium: Synthetic Morphogenesis: From Gene Circuits to Tissue Architecture*, Heidelberg, Germany.

2017 M. Tei, **M. L. Perkins**†, J. Hsia, A. Arkin, and M. Arcak (2017, June) "A quorum sensing-based lateral inhibition system to generate contrasting patterns." Poster session and rapid-fire talk at *Synthetic Biology: Engineering, Evolution, and Design (SEED)*, Vancouver, BC, Canada.
†presenting author

TEACHING AND MENTORING

2022 - 2023	**Mentor for EIPODs Inspire**, informal mentorship programme pairing postdocs with master's students pursuing biology in underserved EU countries
2021 (fall)	Teaching assistant for one-week practical course in developmental biology for incoming doctoral students at EMBL
2019 (fall)	**Graduate Student Instructor for EE 120: Signals and Systems** (100 students)
2019 (fall)	**Graduate Student Instructor for CS 195: Social Implications of Computer Technology** (300 students), including lecturing 20% of total course time
2019 (spring)	**Graduate Student Instructor for CS 195: Social Implications of Computer Technology** (400 students)
2018 - 2019	Mentored undergraduate Samarpita Patra (class of 2020) for independent research project in bioengineering
2016 - 2020	UC Berkeley Women in Computer Science and Electrical Engineering (WiCSE) one-on-one peer mentor for first-year female graduate students

TALKS

2022 (Oct)	"Networked dynamical systems approaches to quantitatively predict multicellular gene expression patterning", FriSBi Seminar Series, Institute of Science and Technology Austria (Klosterneuburg, Austria). Host: Gašper Tkačik
2021 (Apr)	"A networked systems approach to engineering synthetic biological patterning in theory and practice", **Caltech Young Investigators Lecture Series**, California Institute of Technology (virtual). Host: Yisong Yue
2020 (Apr)	"Biological patterning in networks of interacting cells", Tufts University (virtual). Host: Michael Levin
2019 (Dec)	"The basics of bat echolocation", UC Berkeley. Guest lecture for EE 120: Signals and Systems
2019 (Apr)	"Biological patterning in networks of interacting cells", University of Texas, Austin (Austin, TX, USA). Host: Andy Ellington
2019 (Feb)	"Biological networking: how EE meets regenerative medicine", UC Berkeley EECS Annual Research Symposium (Berkeley, CA, USA), one of five invited 5-min student talks
2018 (Feb)	"Pattern formation by networks of biological cells", ETH Zürich Department of Biosystems Science and Engineering (Basel, Switzerland). Host: Mustafa Khammash

ACTIVITIES

2021 - present	Participant in Theory@EMBL Working Group, including as co-organizer for transversal theme and NextGen seminars
2021	Student participant in EMBO Practical Course: *Drosophila* Genetics and Genomics (1 week, virtual)
2019	Student participant in UCSB/KITP quantitative biology course on Morphogenesis: Form, Fate, and Function (5 weeks)
2017 - present	Science outreach volunteer (e.g., Bay Area Scientists in Schools, Golden Gate Science Olympiad, Expanding Your Horizons, Bay Area Teen Science, EMBL ELLS virtual school visits)
2016 - 2017	Social co-chair, UC Berkeley Women in Computer Science and Engineering (WiCSE), organizing mentoring and social events