Morgan Sarah Schwartz

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Education

Fall 2018 - Present — PhD in Biology
California Institute of Technology, Pasadena, CA

Sept 2014 - May 2018 — BA in Biology
Smith College, Northampton, MA

Research Experience

Jan 2019 - Present — Graduate Student, PI: Dr. David Van Valen, California Institute of Technology
Developing a spatial optical barcode method to perform high-throughput live cell pooled library screens.

Oct 2018 - Dec 2018 — Rotation Graduate Student, PI: Dr. Angelike Stathopoulos, California Institute of Technology
Developed transgenic fly lines in order to study germband extension and explored the application of vector field analysis for quantifying the process.

Sept 2015 - Aug 2018 — STRIDE Research Scholar, PI: Dr. Michael Barresi, Smith College
Led a team investigating zebrafish forebrain development and developing software to analyze 3D structures in the brain to enable analytical comparisons of complex structures. Concluding in an honors thesis.

June - Aug 2016 — Janelia Undergraduate Scholar, PI: Dr. Philipp Keller, Janelia Research Campus, Howard Hughes Medical Institute
Studied time-lapse microscopy datasets and developed Python-based tools for characterizing metrics of cell behavior in Drosophila brain development.

Summer 2015 — Intern, PI: Dr. Marwan Sabbagh, Banner Sun Health Research Institute
Analyzed the pathological and clinical presentation of Neurofibrillary Tangle Predominant Dementia in comparison to Alzheimer's Disease.

Aug 2014 - May 2015 — STRIDE Research Scholar, PI: Dr. Laura Katz, Smith College
Studied the biodiversity of plankton populations in tide pools by isolating and sequencing the DNA of individual species.

Aug 2014 - May 2015	Research Assistant, PI: Dr. Thomas Riddell, Smith College *Developed a proposal for walking tour and accompanying marker text to memorialize the Northampton State Hospital.*
Jan - June 2014	Research Assistant, Southwest Autism Research and Resource Center *Studied the effect of volunteer work with rescue animals on the social skills of young adults with Autism Spectrum Disorder.*

Honors and Awards

2020	**Honorable Mention**, National Science Foundation Graduate Research Fellowship
2019	**Undergraduate Teaching Award**, Caltech Student Committee for Biology Advancement
2018	**Highest Honors**, Smith College Biology Department
2018	**First Place Undergraduate Poster**, New England Society for Developmental Biology
2018	**Finalist**, Rhodes Fellowship
2018	**Finalist**, Marshall Scholarship
2017	**Goldwater Scholar**, Barry Goldwater Scholarship and Excellence in Education Foundation
2017	**Associate Membership**, Sigma Xi, The Scientific Research Honor Society
2017	**First Place Undergraduate Poster**, National Society for Developmental Biology
2016	**First Place Undergraduate Poster**, New England Society for Developmental Biology
2014-2018	**Dean's List**, Smith College
2014-2018	**STRIDE Scholar**, Smith College
2014	**Faculty Prize**, Phoenix Country Day School
2014	**National Merit Scholar**, National Merit Scholarship Program

Publications

Noah F. Greenwald, Geneva Miller, Erick Moen, Alex Kong, Adam Kagel, Christine Camacho Fullaway, Brianna J. McIntosh, Ke Leow, Morgan Sarah Schwartz, Thomas Dougherty, Cole Pavelchek, Sunny Cui, Isabella Camplisson, Omer Bar-Tal, Jaiveer Singh, Mara Fong, Gautam Chaudhry, Zion Abraham, Jackson Moseley, Shiri Warshawsky, Erin Soon, Shirley Greenbaum, Tyler Risom, Travis Hollmann, Leeat Keren, Will Graf, Michael Angelo, David Van Valen. (2021) **Whole-cell segmentation of tissue images with human-level performance using large-scale data annotation and deep learning.** *bioRxiv.* doi:10.1101/2021.03.01.431313.

Dylan Bannon, Erick Moen, Morgan Schwartz, Enrico Borba, Takamasa Kudo, Noah

Greenwald, Vibha Vijayakumar, Brian Chang, Edward Pao, Erik Osterman, William Graf, David Van Valen. (2021) **DeepCell Kiosk: scaling deep learning–enabled cellular image analysis with Kubernetes.** *Nature Methods.* doi:10.1038/s41592-020-01023-0. [`https://github.com/vanvalenlab/kiosk-console`]

Jake Schnabl, Mackenzie P. H. Litz, Caitlin Schneider, Nadia PenkoffLidbeck, Sarah Bashiruddin, Morgan S. Schwartz, Kristin Alligood, Stephen H. Devoto, Michael J. F. Barresi. (2020) **Characterizing the diverse cells that associate with the developing commissures of the zebrafish forebrain.** *Developmental Neurobiology.* doi:10.1002/dneu.22801.

Morgan S Schwartz, Jake Schnabl, Mackenzie PH Litz, Benjamin S Baumer, Michael Barresi (2020) **ΔSCOPE: A new method to quantify 3D biological structures and identify differences in zebrafish forebrain development.** *Developmental Biology.* [`https://github.com/msschwartz21/deltascope`]

Erick Moen, Enrico Borba, Geneva Miller, Morgan Schwartz, Dylan Bannon, Nora Koe, Isabella Camplisson, Daniel Kyme, Cole Pavelchek, Tyler Price, Takamasa Kudo, Edward Pao, William Graf, David Van Valen. (2019) **Accurate cell tracking and lineage construction in live-cell imaging experiments with deep learning.** *bioRxiv.* doi:10.1101/803205' [`https://github.com/vanvalenlab/deepcell-tracking`]

Morgan Schwartz, Thomas G Beach, Andrew Tsai, Michael Malek-Ahmadi, Sandra Jacobson, Lucia I Sue, Kathryn Davis, Marwan N Sabbagh and Geidy Serrano. (2016) **Neurofibrillary Tangle Predominant Dementia: Clinical and pathological description in a case series**. *Journal of Alzheimer's Disease and Parkinsonism* doi:10.4172/2161-0460.1000204.

Posters and Presentations

Schwartz M, Van Valen D, et al. (2019) **Deep learning enabled image analysis unites high throughput functional genomics with live cell imaging.** Presentation. Women in Computational Biology, Janelia Research Campus, VA.

Schwartz M, Barresi MJ, et al. (2018) **ΔSCOPE: A new method to quantify biological structures and identify differences in zebrafish forebrain development.** Poster. New England Society for Developmental Biology, Woods Hole, MA.

Schwartz M, Barresi MJ, et al. (2017) **A new computational method to quantify 3D image data to detail changes in morphological structure and spatial relationships during nervous system development.** Poster. National Society for Developmental Biology, Minnesota, USA.

Schwartz M. (2016) **Untangling brain development at Janelia Research Campus.** Presentation. Smith in the World, Massachusetts, USA.

Schwartz M, Barresi MJ, et al. (2016) **Investigating the role of robo4 in glial bridge**

condensation and its influence on the formation of the post-optic commissure. Poster. New England Society for Developmental Biology, Massachusetts, USA.

Schwartz M, Browne B, Sabbagh M. (2015) **Barriers and solutions to under-enrollment in Alzheimer's Disease clinical trials.** Poster. Banner Health Summer Research Symposium, Arizona, USA.

Schwartz M, McDannell B, El-Banna G, Grattepanche JD, Katz LA. (2015) **Microbial biodiversity in the ocean.** Poster. Smith College Celebrating Collaborations, Massachusetts, USA.

Schwartz M, Smith S, Riddell T. (2015) **A walking tour of Northampton State Hospital.** Presentation. Smith College Celebrating Collaborations, Massachusetts, USA.

Patents

Schwartz M, Pao E, Van Valen D. **Deep learning enabled spatial optical barcodes for pooled library screens.** Filed 13 Nov 2019. US Provisional Patent.

Teaching Experience

Fall 2021 **Teaching Assistant for DL@MBL: Deep Learning for Microscopy Image Analysis**, Marine Biological Laboratory

Spring 2021 **Teaching Assistant for BeBi 205: Deep Learning for Biological Data**, California Institute of Technology
Worked alongside Professor Van Valen to develop and teach a new course on the practical applications of deep learning for biological data.
`https://vanvalenlab.github.io/bebi205`

Fall 2019 & 2020 **Teaching Assistant for Bi 122: Genetics**, California Institute of Technology
Collaborated with a team of four teaching assistants to write homework assignments and exam material.

Spring 2019 **Head Teaching Assistant for Bi 1: Principles of Biology**, California Institute of Technology
Led a team of two professors and eighteen teaching assistants to manage a required non-major course of 200 students. Earned a teaching award.

Winter 2019 **Teaching Assistant for Bi 8: Introduction to Molecular Biology**, California Institute of Technology
Worked with a team of six graduate teaching assistants to write homework and exam material and hold weekly recitation sections to supplement lecture material.

Fall 2017 **Lab Assistant for Bio 303: Developmental Biology**, Smith College
Worked collaboratively with the instructor and a three-person team to prepare experiments and was personally responsible for confocal microscope imaging.

Spring 2016 **Tutor for Bio 230: Genomes and Genetic Analysis**, Smith College

Led weekly and on request tutoring sessions, where I helped students master unfamiliar material and prepare for tests.