TAL SCULLY

talscully@fas.harvard.edu ⋄ 617-797-1875

EDUCATION

Harvard University, PhD Candidate in Systems, Synthetic, and Quantitative Biology (SSQB) *2018–Present*
Advisor: Allon Klein, PhD, Professor of Systems Biology
Research: Using single-cell genomics to establish tunicate blood as a model for studying cell type evolution.

Massachusetts Institute of Technology, BS in Physics and in Theater Arts (GPA: 4.6/5.0) *2014–2018*
Selected coursework:
Physics: Quantum Mechanics I II & III, Statistical Mechanics, Relativity, Junior Laboratory
Chemistry: Organic Chemistry I, Thermodynamics and Kinetics, Physical Chemistry II
Computer Science: Mathematics for Computer Science, Engineering Computation & Data Science

RESEARCH EXPERIENCE

Klein Lab, Harvard Dept. of Systems Biology, *Graduate Student* *May 2019–Present*
PI: Allon Klein, PhD, Professor of Systems Biology.
- Systematically testing hypotheses of cell type evolution using single-cell RNA sequencing (scRNA-seq) data of blood from eleven tunicate species.
- Modernized *Ciona robusta* blood cell classifications using scRNA-seq, live imaging, and in situ hybridization.
- Demonstrated dramatic evolutionary divergence between *Ciona robusta* and human immune cells.

Hormoz Lab, Dana Farber Cancer Institute Dept. of Data Science, *Rotation Student* *Oct–Dec 2018*
PI: Sahand Hormoz, PhD, Assistant Professor of Systems Biology.
Investigated the transcriptomic differences between cancerous and non-cancerous bone marrow cells from myeloproliferative neoplasm patients using single-cell RNA sequencing.

Klein Lab, Harvard Dept. of Systems Biology, *Undergraduate Researcher* *Jun–Aug 2017*
PI: Allon Klein, PhD, Professor of Systems Biology.
Mentors: Caleb Weinreb, PhD and James Briggs, PhD.
Developed a computational method for quantifying the evolutionary conservation of gene expression patterns between frog and zebrafish development.

Field Group, MIT Dept. of Chemistry, *Undergraduate Researcher* *Jun 2016–Mar 2017*
PI: Robert Field, PhD, Haslam and Dewey Professor of Chemistry.
Mentor: Alex Hull, PhD.
Characterized synthesis of diatomic phosphorus using laser induced fluorescence and microwave spectroscopy.

Buchwald Group, MIT Dept. of Chemistry, *Undergraduate Researcher* *Feb 2015–Jun 2016*
PI: Stephen L. Buchwald, PhD, Camille Dreyfus Professor of Chemistry.
Mentor: Rana Kashif Khan, PhD.
Developed a synthesis of unnatural amino acids, and discovered an unknown intermediate reaction step.

AWARDS AND RECOGNITION

International Tunicate Meeting, *Invited Talk* *Jul 2024*

Harvard Systems Biology Dept., *Lynch Fellow* *2022*

Harvard Certificate of Distinction in Teaching, *for the Fall 2019 Semester* *Apr 2020*

NSF Graduate Research Fellowship Program, *Honorable Mention* *Mar 2018*

MENTORSHIP AND TEACHING

Student Mentoring
Cohen Manges, Undergraduate Researcher based at Swarthmore College (remote) *Oct 2024–Present*
Natalia Orlovsky, Graduate Rotation Student *Apr–May 2023*
Aashna Shah, Graduate Rotation Student *Feb–Mar 2021*
Hai Pham, Undergraduate Researcher, with Co-Mentor Laura Bagamery, PhD *Jun–Aug 2021*

Mentoring Triads, Harvard Genetics Postdoc Group, *Invited Speaker* *Mar 2024*
Created and ran a workshop on approaching difficult conversations in mentoring relationships.

Communication of Science Class, Harvard Dept. of Systems Biology, *Teaching Fellow* *Sep–Dec 2019*
Taught graduate students the fundamentals of science writing, figure design, and oral presentation.

Junior Laboratory Class, MIT Dept. of Physics, *Teaching Assistant* *Sep–Dec 2017*
Taught undergraduates fundamental experiments in modern physics, along with error analysis and writing.

LEADERSHIP AND SERVICE

Development, *Ad Hoc Reviewer* *March 2024–Present*

Harvard Systems Biology Dept., *Diversity Equity and Inclusion Fellow* *Jan–Jun 2023*
Established a G1 Peer Mentorship Program to support first-year students in the SSQB PhD program and reduce the effects of the "hidden curriculum" in academia.

Scientific Citizenship Initiative, *Leadership Team* *Mar 2022–Jun 2024*
Advised the leadership of the Harvard Scientific Citizenship Initiative on current and future directions.

Social Issues in Biology "Race in Biosciences" Curriculum, *Co-Author* *Sep 2020–Jan 2023*
Created a journal club series covering a range of topics at the intersection of race, biology, and academia. Available at https://projects.iq.harvard.edu/race-in-biosciences

Social Issues in Biology Journal Club, *Co-Lead* *Sep 2019–May 2023*
Organized monthly journal clubs for the Harvard community on subjects at the intersection of science and society. Topics included race in biology, science communication, and ethics of emerging biotechnologies.

SSQB Equity and Inclusion Working Group, *Co-Founder and Chair* *Jun 2020–Dec 2022*
Co-wrote the SSQB Diversity Statement and advocated for structures to promote equity and belonging.

SSQB Diversity in Graduate Admissions Working Group, *Co-Founder and Chair* *Jul 2020–Sep 2021*
Established an Application Assistance Program for applicants from underrepresented backgrounds in STEM.

OUTREACH

Civic Science Clinic, *Community Organization Fellow* *May–Aug 2023*
Gained hands-on community engagement experience with the nonprofit Essential Partners. Characterized the challenges faced by school boards, and identified strategies for effective engagement of school districts.

"What is Systems Biology," Cambridge Science Festival, *Co-Lead* *Apr 2019*
Created an event for the Cambridge Science Festival with interactive activities about systems biology at an approachable level for K–12 students.

MIT Museum Girl's Day, *Invited Speaker* *Nov 2018*
Spoke to kids aged 10+ about using optical tweezers to study mechanical properties of biological molecules.

SPLASH, MIT Educational Studies Program, *Volunteer Teacher* *Annually, Nov 2014–2018*
Developed and taught classes to high school students on Crystal Field Theory, Statistical Mechanics, Special Relativity, Computational Biology, and Improv Comedy.

PUBLICATIONS

Scully TD, Pickett CJ, Gort-Freitas NA, Davidson B, Klein AM. Immune cell type divergence in a basal chordate. *In submission.*

Scully TD, Klein AM. A mannitol-based buffer improves single-cell RNA sequencing of high-salt marine cells. bioRxiv. 2023. p. 2023.04.26.538465.
Available from: https://www.biorxiv.org/content/10.1101/2023.04.26.538465v1

Khan RKM, Zhao Y, **Scully TD**, Buchwald SL. 2018. Catalytic Arylhydroxylation of Dehydroalanine in Continuous Flow for Simple Access to Unnatural Amino Acids. Chemistry 24 (57): 15215-18.

PRESENTATIONS

International Tunicate Meeting, Santa Cruz, CA *Jul 2024*
Invited Talk: "Evolution of cell types in tunicate blood cells"

ASCB Cell Bio 2023, Boston, MA *Dec 2023*
Poster: "Evolution of Innate Immune Cells in the Urochordate *Ciona robusta*."

Harvard Systems Biology Pizza Talk, Boston, MA *Oct 2023*
Talk: "Evolution of Innate Immune Cells in the Urochordate *Ciona robusta*."

EMBL The Identity and Evolution of Cell Types, Virtual *May 2021*
Poster: "The evolution of vertebrate red blood cells."

OTHER ACTIVITIES

MIT Laya and Jerome B. Wiesner Student Art Award *May 2018*
Institute-wide award presented annually to up to four students (undergraduate or graduate), living groups, organizations or activities for outstanding achievement in and contributions to the arts at MIT.

David Epstein Award, *MIT Music and Theater Arts Dept.* *May 2018*
In recognition of distinguished service and musical contribution to the MIT Symphony Orchestra.

Ragnar and Margaret Naess Award, *MIT Music and Theater Arts Dept.* *May 2017*
In recognition of exceptional talent and commitment to performance at MIT.

MIT Emerson Scholarship for Private Music Study, *Flute* *Sept 2014–May 2018*

MIT Shakespeare Ensemble, *President (2016–18), Officer At Large (2015–16)* *May 2015–May 2018*

MIT Roadkill Buffet (Improv Comedy Group), *Vice President* *May 2017–May 2018*