

TAL SCULLY

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EDUCATION

Harvard University, PhD Student in Systems Biology 2018 – Present

Advisor: Allon Klein, PhD, Assistant Professor of Systems Biology.

Interested in cell differentiation and how cells make fate decisions.

Massachusetts Institute of Technology, BS in Physics and in Theater Arts 2014 – 2018

Selected coursework in science disciplines (GPA: 4.6/5.0):

Physics: Quantum Mechanics I II & III, Statistical Mechanics, Relativity, Junior Laboratory

Chemistry: Organic Chemistry, Thermodynamics and Kinetics, Physical Chemistry II

Computer Science: Mathematics for Computer Science, Engineering Computation & Data Science

Brookline High School 2010 – 2014

RESEARCH EXPERIENCE

Klein Lab, Harvard Medical School Dept. of Systems Biology

PI: Allon Klein, PhD, Assistant Professor of Systems Biology.

Graduate researcher (May 2019 – Present): Investigating how cells make fate decisions, using mouse hematopoiesis as a model system.

Rotation student (Jan – March 2019): Explored ways to arrest the cell cycle in zebrafish embryos in order to investigate the connection between cell cycle and cell differentiation.

Graduate student mentor: Kalki Kukreja.

Undergraduate Research Intern (June – Aug 2017): Developed a computational method for comparing gene expression patterns between species, and used this method to investigate evolutionary conservation of gene expression between *Xenopus tropicalis* and zebrafish.

Graduate student mentors: Caleb Weinreb, PhD and James Briggs, PhD.

First Qualifying Exam, Harvard University Systems Biology PhD Program May 2019

Mentor: Vijay G. Sankaran, MD, PhD, Associate Professor of Pediatrics

Updated an established model of translation kinetics in order to better understand how ribosome concentration affects translational regulation of gene expression. Currently writing up the results for publication.

Rotation Student, Hormoz Lab, Dana-Farber Cancer Institute Oct – Dec 2018

PI: Sahand Hormoz, PhD, Assistant Professor of Systems Biology.

Investigated the causes and effects of myeloproliferative neoplasms using single cell RNA sequencing.

Undergraduate Researcher, Buchwald Group, MIT Dept. of Chemistry Feb 2015 – June 2016

PI: Stephen L. Buchwald, PhD, Camille Dreyfus Professor of Chemistry.

Mentor: Rana Kashif Khan, PhD.

Developed a synthesis of unnatural amino acids for use in new drugs, and discovered a previously unknown intermediate reaction step. Co-authored paper published in *Chemistry: A European Journal*.

TEACHING EXPERIENCE

Teaching Fellow, Science Communication, Harvard Dept. of Systems Biology Sept – Dec 2019

Taught undergraduates how to approach error analysis, manuscript writing, and oral presentations of fundamental experiments in modern physics.

Teaching Assistant, Junior Laboratory, MIT Dept. of Physics*Sept – Dec 2017*

Taught undergraduates how to approach error analysis, manuscript writing, and oral presentations of fundamental experiments in modern physics.

SCIENCE COMMUNICATION AND OUTREACH**Co-Lead Organizer, “What is Systems Biology,” Cambridge Science Festival***April 2019*

Worked with 4 other graduate students to organize an event open to the public as part of the Cambridge Science Festival. Designed several interactive activities about systems biology at an approachable level for K-12 students.

Speaker, Harvard Science in the News Lectures Series*April 2020*

Will speak to a non-scientist audience about how single cell RNA sequencing can help illuminate fundamental questions in developmental biology.

Speaker, MIT Museum Girl’s Day*Nov 2018*

Spoke to girls aged 10+ about optical trapping, an advanced biophysics technique used to study the mechanical properties of biological molecules.

Volunteer Teacher, SPLASH, MIT Educational Studies Program*Annually, Nov 2014 – 2018*

Developed and taught classes for SPLASH, an annual weekend-long program of classes taught by MIT students to high schoolers. Class topics I taught included Crystal Field Theory, Statistical Mechanics, Special Relativity, Computational Biology, and Improv Comedy.

AWARDS, LEADERSHIP, AND EXTRACURRICULAR**NSF Graduate Research Fellowship Program, Honorable Mention***March 2018***MIT Emerson Scholarship for Private Music Study, MIT***Sept 2014 – May 2018***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*May 2018*

From the MIT Music and Theater Arts Dept. in recognition of distinguished service and musical contribution to the MIT Symphony Orchestra.

Ragnar and Margaret Naess Award*May 2017*

From the MIT Music and Theater Arts Dept. in recognition of exceptional talent and commitment to performance at MIT.

President and Officer-at-Large of the MIT Shakespeare Ensemble*May 2015 – May 2018***Vice President of MIT Comedy Improv Troupe “Roadkill Buffet”***May 2017 – May 2018*

PUBLICATIONS

Khan, R. Kashif M., Yang Zhao, Tal D. Scully, and Stephen L. Buchwald. 2018. “Catalytic Arylhydroxylation of Dehydroalanine in Continuous Flow for Simple Access to Unnatural Amino Acids.” *Chemistry* 24 (57): 15215-18.

SKILLS

Computer languages known: Python, MATLAB, LaTeX, JavaScript, jQuery, HTML/CSS.

Proficient in public speaking.