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Hersh K. Bhargava

Curriculum Vitae

Education

2019–Present **University of California, San Francisco**, *San Francisco, California*.
Ph.D. in Biophysics. Designated Emphasis in Complex Biological Systems.
Advisors: Professor Wendell A. Lim & Professor Hana El-Samad

2015–2019 **University of California, Berkeley**, *Berkeley, California*.
B.A. in Molecular and Cell Biology. Concentration in Biological Chemistry.
Advisor: Professor James H. Hurley

2012–2015 **Phillips Exeter Academy**, *Exeter, New Hampshire*.

Awards and Fellowships

2024 **Selected Speaker & NIH Travel Award, NIH/NCI Immune Oncology Translational Network (IOTN) Capstone Meeting**.
2023 **Selected Lecture, Michael Page, Ph.D., Discovery Fellows 10th Anniversary Symposium**.
2023 **Fifty Years Fifty 50 Fellow**.
2023 **Poster Talk Award (Biomedical Div.), Dept. of Defense NDSEG Fellows National Meeting**.
2023 **UC President's Lindau Nobel Laureate Meeting Fellowship**.
2022 **UCSF Entrepreneurship Scholarship**.
2021–2024 **Department of Defense NDSEG Fellowship**.
2021–2024 **UCSF Discovery Fellowship**.
2021 **UCSF Computational Innovator Pre-Doctoral Fellowship**.
2021 **Excellence in Teaching Award, UCSF Biophysics Graduate Program**.
2021 **National Science Foundation GRFP Honorable Mention**.
2020 **ARCS Foundation Fellowship (NVIDIA Scholar)**.
2019 **T32 Pre-Doctoral Fellowship (Molecular Biophysics), NIH/NIGMS**.
2017 **HHMI Janelia Undergraduate Scholars Fellowship**.

Scientific & Professional Experience

2019–Present **Biophysics Ph.D. Candidate**, University of California, San Francisco.
Advisors: Prof. Hana El-Samad & Prof. Wendell A. Lim. Developing computational and esxperimental methods for rational engineering of immune cell based therapeutics.

2021–Present **Co-Founder**, Skolay, https://skolay.com.
Responsible for the architecture of the technical stack, corporate strategy and direction, and oversight of engineering and design teams. Skolay is a platform for 1:1 office hours style conversations between authors and readers, podcasters and listeners, and other pairs of curious people.

2012–Present **Co-Founder**, H2 Micro, https://h2micro.com.
Responsible for management of technical development and design teams, financial assets, and long-term institutional planning. H2 Micro is a technical consulting firm that has developed custom software for medical, industrial, and research applications, including Medical Crosscheck.

2015–2020 **Molecular Biophysics Researcher**, University of California, Berkeley.
Advisor: Prof. James H. Hurley. Discovered the structural basis for negative regulation of human autophagy by the Rubicon-Rab7 complex (Bhargava et al., *PNAS*, 2020). Mentored an undergraduate student.

2016–2020 **Biomedical Machine Learning Research Fellow**, University of Pennsylvania & Case Western Reserve University.
Advisor: Prof. Anant Madabhushi. Invented a computer vision + machine learning approach that accurately predicts prostate cancer risk based on routine histology images and population-specific information (Bhargava et al., *Clin Cancer Res*, 2020).

2017 **Janelia Undergraduate Scholar**, HHMI Janelia Research Campus.
Advisor: Dr. Eric Schreiter. Developed a novel small-molecule + protein fusion calcium indicator of neuronal activity for use in neuroscience research.

Scientific Papers

** denotes equal contribution*

1. Kim MS, **Bhargava HK**, Shavey GE, Lim WA, El-Samad H*, Ng AH*
A degron-based bioPROTAC for controlling signaling in CAR-T cells.
ACS Synthetic Biology. doi: 10.1021/acssynbio.4c00109. 2024.

2. Allen GM*, Frankel NW*, Reddy NR, **Bhargava HK**, Yoshida MA, Stark SR, Purl M, Lee J, Yee JL, Yu W, Li AW, Garcia KC, El-Samad H, Roybal KT, Spitzer MH, Lim WA
Synthetic cytokine circuits that drive T cells into immune-excluded tumors.
Science. doi: 10.1126/science.aba1624. 2022.

3. Daniels KG, Wang S, Simic MS, **Bhargava HK**, Capponi S, Tonai Y, Yu W, Bianco S, Lim WA
Decoding CAR T cell phenotype using combinatorial signaling motif libraries and machine learning.
Science. doi: 10.1126/science.abq0225. 2022.

4. Deo C*, Abdelfattah AS*, **Bhargava HK**, Berro A, Falco N, Moeyaert B, Chupanova M, Lavis LD, Schreiter ER
The HaloTag as a general scaffold for far-red tunable chemigenetic indicators
Nature Chemical Biology. doi: 10.1038/s41589-021-00775-w. 2021.

5. **Bhargava HK**, Tabata K, Byck JM, Hamasaki M, Farrell DP, Anishchenko I, DiMaio F, Im YJ, Yoshimori T, Hurley JH
Structural basis for autophagy inhibition by the human Rubicon-Rab7 complex
Proceedings of the National Academy of Sciences. doi: 10.1073/pnas.2008030117. 2020.

6. **Bhargava HK**, Leo P, Elliott R, Janowcyzk A, Whitney J, Gupta S, Fu P, Yamoah K, Rebbeck T, Feldman D, Lal P, Madabhushi A
Computationally derived image signature of stromal morphology is prognostic of prostate cancer recurrence following prostatectomy in African American patients.
Clinical Cancer Research. doi: 10.1158/1078-0432.CCR-19-2659. 2020.

7. Arriola A, Farahani S, **Bhargava HK**, Guzzo T, Brooks J, Lal P
PD-L1 Expression Reveals Significant Association with Squamous Differentiation in Upper Tract Urothelial Carcinoma.
American Journal of Clinical Pathology. doi: 10.1093/ajcp/aqz002. 2019.

8. Kockel L, ..., **Bhargava HK**, ..., Kim SK
An Interscholastic Network To Generate LexA Enhancer Trap Lines in Drosophila
G3 (Bethesda). doi: 10.1534/g3.119.400105. 2019.

Talks & Selected Presentations

1. **Bhargava HK**
Rational design of T cells that overcome immunologically cold tumors.

72nd Lindau Nobel Laureate Meeting

2. **Bhargava HK**, Allen GM, El-Samad H, Lim WA
Engineering Synthetic Cytokine Circuits to Remodel Disease Microenvironments.
NIH Cancer Moonshot Immune Oncology Translational Network (IOTN) Semi-Annual Meeting. 2023. (Contributed Talk)

3. **Bhargava HK**, El-Samad H, Lim WA
Engineering principles of T cell proliferation control: computational design of circuits that counteract tumor suppression.
Winter Q-bio. 2023. (Contributed Talk)

4. **Bhargava HK**, Leo P, Lal P, Madabhushi A
Artificial Intelligence to Alleviate the Racial Disparity in Prostate Cancer.
ARCS Foundational National Scholars Speaker Series (Invited Talk). 2021. **[Link].**

5. **Bhargava HK**, El-Samad H, Lim WA
Human-computer synergy for the next generation of live cell therapeutics.
ARCS Foundation Annual Symposium (Invited Talk). 2021. **[Link].**

6. **Bhargava HK**, Leo P, Elliott R, Janowcyzk A, Whitney J, Gupta S, Yamoah K, Rebbeck T, Feldman D, Lal P, Madabhushi A
Computer-extracted stromal features of African-Americans versus Caucasians from H&E slides and impact on prognosis of biochemical recurrence.
American Society of Clinical Oncology Annual Meeting. doi: 10.1200/JCO.2018.36.15_suppl.12075. 2018.

7. **Bhargava HK**, Deo C, Lavis LD, Schreiter ER,
A Small Molecule + Protein Hybrid Calcium Indicator.
HHMI Janelia Research Campus Undergraduate Scholars Symposium. 2017.

8. **Bhargava HK**, Schulze-Gahmen U, Stjepanovic G, Hurley JH
Structural and Biochemical Analysis of the Brd4:P-TEFb Complex.
NIH Structural Biology Related to HIV/AIDS Meeting. 2017.

Patents

1. Schreiter ER, Lavis LD, Deo C, **Bhargava HK**, Abdelfattah A (2020), **Chemogenetic Calcium Indicators.** US Patent 11,708,397.

2. **Bhargava HK**, Leo P, Lal P, Madabhushi A (2021), **Population-specific prediction of prostate cancer recurrence based on stromal morphology features.** US Patent App. 16/886,966.

Teaching & Volunteer Experience

2023–Present **Lead Instructor**, *Principles of Cell Engineering (BMS 270)*.
Created and taught the UCSF Principles of Cell Engineering mini-course (BMS 270), a three-week intensive graduate-level course focused on human cell engineering.

2022–Present **Moderator**, *Cell Engineering and Synthetic Biology Seminar Series, UCSF*.

2022–2023 **Moderator**, *Biophysics State of the Field Lecture Series, UCSF*.

2020–Present **Student Member**, *Biophysics Diversity, Equity, and Inclusion Working Group, UCSF*.
Serve as a student member of the UCSF Biophysics Graduate Program's task force to develop and execute concrete strategies to foster diversity, equity, and inclusion within the Biophysics community. Represent UCSF at outreach events including NIH and SACNAS meetings.

2021–2024 **Student Member**, *Biophysics Graduate Program Admissions Committee, UCSF*.
Serve as a student member of the UCSF Biophysics Graduate Program admissions committee.

2020–2023 **Graduate Teaching Assistant**, *UCSF*.

Graduate teaching assistant for Macromolecular Methods (Biophysics 204A) and Biostatistics (Biostatistics 273). Redesigned curriculum and course materials for biostatistics course taken by all first year graduate students.

2019–2023 **Scientist & Instructor**, *Science and Health Education Partnership, UCSF*.

Volunteer instructor for an outreach program focused on sparking interest in science among San Francisco public school students. Planned lessons and activities for high school science courses covering topics including immunology, synthetic biology, and physics.

2016–2019 **Moderator**, *The Berkeley Forum*.

Responsible for the design of questions for moderated sessions with distinguished speakers as well as for carrying out the moderated session on stage. The Berkeley Forum is a non-profit, non-partisan, student-run organization dedicated to fostering productive discourse in the Berkeley community and beyond.

2017–2019 **Architect & Engineer**, *Departments of Chemistry and Molecular & Cell Biology, UC Berkeley*.

Collaborated with course faculty for MCB C100A (Biophysical Chemistry) to develop and implement a custom teaching tool that facilitates continuous student-instructor feedback. Piloted this application in 300+ student introductory Chemistry courses.

Languages

English	**Fully Proficient**	*Native speaker*
Latin	**Fully Proficient**	*5 years of study*
Ancient Greek	**Fully Proficient**	*2 years of study*
French	**Working Proficiency**	*2 Years of Study*