



Mohammad Fallahi-Sichani, Ph.D.
Associate Professor of Biomedical Engineering

Statement of Interest in 2025 CMBE Council Membership

Dear CMBE Council,

It is with great pleasure that I write this statement to express my continued interest in serving the CMBE community as a Council Member. In 2023 and 2024, I applied for this same role, but I was thrilled to see outstanding colleagues elected in both years. I recognize the importance of service to the CMBE community, and I will be very delighted if my application is considered for the CMBE Council membership this year.

I am an Associate Professor of Biomedical Engineering and the Basic Science Lead of the Melanoma Translational Research Team at the UVA Comprehensive Cancer Center. In my laboratory, I am directing a research program with primary area of focus at the interface of Systems Biology, Cellular and Molecular Bioengineering, and Cancer Pharmacology. As a research group, my mentees and I are interested in understanding the fundamental mechanisms that regulate the heterogeneous behavior of human cells in response to perturbations, including cytokines, stress, oncogenic mutations, and therapeutic drugs. Our approach combines targeted development and utilization of high-throughput, multiplexed technologies, generation of hypothesis-driven datasets, and integration of computational tools, to create quantitative models of cellular response that are predictive at single-cell, molecular and network levels. The iterative use of these methods has enabled us to make predictions about key biological mechanisms underlying cellular response to perturbations and therapeutic treatments, validate our predictions, and use them to guide better therapies for precision medicine.

In addition to mentoring students and trainees at different academic levels and diverse backgrounds, and serving multiple training programs at UVA, I have served multiple professional associations, including the Biomedical Engineering Society (BMES) as well as its Cell and Molecular Bioengineering (CMBE) Special Interest Group (SIG), American Association for Cancer Research (AACR) and the Cancer Systems Biology Consortium (CSBC). I have been an active member of BMES since 2008, helping the organization grow in showcasing biomedical engineering research through the BMES annual meetings. For the 2024 BMES Annual Meeting (organized in Baltimore, MD), I served as the Bioinformatics, Computational and Systems Biology Track Chair, oversaw the construction of platform sessions from the selected and accepted oral presenters and communicated with session chairs to ensure the overall success of meeting. Since 2017, I have continuously served on the BMES abstract review committee and co-chaired oral platform sessions in the Systems Biology Track of many BMES meetings. I was a CMBE Rising Star Awardee in 2023, and participated in the review of CMBE Rising Star Award applications for the following CMBE conferences. Since 2021, I have been serving as an Associate Editor on the editorial board of IET Systems Biology, an open-access, peer-reviewed journal published by John Wiley and Sons, covering research on intra- and inter-cellular dynamics using systems biology approaches. In addition, I have been active in peer review of research grants for NIH study sections and multiple other agencies. Together, I believe that these and other experiences (listed in my CV) have prepared me to serve as an influential CMBE Council member.

As my research career has evolved, the BMES, CMBE SIG, and interaction with their members have been a source of inspiration. I have been enjoying networking and learning from many impactful researchers and mentors. As a future member of the BMES CMBE Council, I will build upon my transdisciplinary academic training, research, and mentoring experience to expand the CMBE's reach by engaging a broader range of researchers and trainees with respect to background, career stage, geography, and research programs across all relevant disciplines. In this direction, I aim to help the BMES CMBE SIG identify additional opportunities to enhance career development for junior investigators, raise funds that support and expand the CMBE's educational missions, and promote innovative and inclusive collaborations across the CMBE community and other synergistically related fields such as the Systems Biology community. Being part of the Council will provide a unique opportunity to work with an amazing group of leaders in utilizing outstanding resources toward the success of current and future generations of scientists, engineers, and clinicians.

Sincerely yours,
Mohammad Fallahi-Sichani, PhD
Associate Professor of Biomedical Engineering

PERSONAL DATA**First Name:** Mohammad**Last name:** Fallahi-Sichani**Current Position Title:** Associate Professor of Biomedical Engineering**Current Primary Affiliation:** University of Virginia School of Medicine**Address:** 415 Lane Rd, Building MR5, Room 2215, Charlottesville, VA 22903**Tel:** (434) 924-9950**Email:** fallahi@virginia.edu**Lab Webpage:** <https://fallahi-sichani-lab.com>**X:** [@MFallahiSichani](#)**EDUCATION**

PhD in Chemical Engineering, University of Michigan, Ann Arbor, MI 04/2012

MSc in Chemical Engineering, University of Michigan, Ann Arbor, MI 04/2009

Integrated BSc and MSc in Biotechnology, University of Tehran, Tehran, Iran 02/2007

ACADEMIC APPOINTMENTS**University of Virginia (UVA), Charlottesville, VA**

(Tenured) Associated Professor, Department of Biomedical Engineering 07/2023 - Present

- Full Member, UVA Comprehensive Cancer Center 06/2020 - Present

- Faculty Member, Molecular and Cellular Basis of Disease Graduate Program 06/2020 - Present

Assistant Professor, Department of Biomedical Engineering 06/2020 - 06/2023

University of Michigan, Ann Arbor, MI

Assistant Professor, Department of Biomedical Engineering 05/2017 - 05/2020

- Core Member, Rogel Cancer Center 05/2017 - 05/2020

- Affiliated Faculty Member, Department of Dermatology 01/2018 - 05/2020

Harvard Medical School, Boston, MA

Postdoctoral Fellow, Department of Systems Biology – Mentor: Peter Sorger 01/2012 - 04/2017

University of Michigan, Ann Arbor, MI

Graduate Student Research Assistant, Department of Chemical Engineering – 09/2007 - 12/2011

Mentors: Jennifer Linderman and Denise Kirschner

HONORS AND AWARDS

Shannon Center Mid-Career Fellowship University of Virginia, 2024-27

BMES Cell and Molecular Bioengineering (CMBE) Rising Star Award 2023

Research Collaboration Award, UVA Research Achievement Awards University of Virginia, 2022

NIH/NIGMS Maximizing Investigators' Research Award (MIRA) for Early-Stage Investigators 2019

Department of Defense CDMRP Career Development Award 2018

V Foundation for Cancer Research V Scholar Award 2017

American Association for Cancer Research (AACR) Scholar-in-Training Award 2015, 2016, 2017

NIH/NCI K99/R00 Pathway to Independence Award 2015

Life Sciences Research Foundation (LSRF) Postdoctoral Fellowship 2013

Distinguished Young Scholars Seminar Speaker University of Washington, 2012

Richard and Eleanor Towner Award for Outstanding PhD Research	University of Michigan, 2011
Rackham Predoctoral Fellowship	University of Michigan, 2011
Phi Kappa Phi Graduate Award	2010
Rackham International Student Fellowship	University of Michigan, 2009
Ranked 1 st in the nation-wide entrance exam for Iranian universities among 450,000 participants	2001

RESEARCH ACTIVITIES

A. Areas of Research Interest:

Single Cell Pharmacology – Multi-parametric analysis of the heterogeneous cellular drug responses
 Cancer Systems Biology – Adaptive regulation of tumor cell fate decisions
 Computational Biology – Multi-scale modeling of bio-molecular networks and reactions

B. Active Projects/Awards:

R01-CA249229 05/01/2021 – 04/30/2027
 NIH/NCI PI: Fallahi-Sichani
Linking genetic, epigenetic and signaling mechanisms of oncogene addiction Total Cost: \$1,789,319

The goal of this project is to build a network-level and single-cell understanding of the interactions between genetic, epigenetic and signaling mechanisms that define the state of BRAF oncogene dependency in BRAF-mutated tumor cells.

R35-GM133404 08/15/2024 – 07/31/2029
 NIH/NIGMS PI: Fallahi-Sichani
Decoding the logic of cellular signaling through the integration of dynamic, single-cell and multiplexed methods Total Cost: \$1,954,865

The goal of this project is to understand the mechanisms that underpin cellular plasticity and heterogeneous cell fate decisions in response to MAP kinase mediated environmental and therapeutic perturbations through the study of AP-1 transcription factor dynamics and via leveraging cutting-edge, high-throughput, multiplexed technologies, genome-wide analysis, and predictive computational modeling.

ME230041 06/01/2024 – 05/31/2027
 Department of Defense (Melanoma Research Program) PI: Tavakoli Nia
Uncovering Cell-Intrinsic and Extrinsic Factors Governing Melanoma Dormancy at Single-Cell Resolution Co-PI: Fallahi-Sichani
 Total Cost: \$646,252

The overall goal of this project is to develop a multi-factorial understanding of the role of cell-intrinsic and microenvironmental mechanisms in determining melanoma dormancy or colonization in the lung.

U54-CA274499 09/01/2022 – 08/31/2027
 NIH/NCI Co-Leads: Fallahi-Sichani and Rohde
High-Content Imaging & Analysis Core Total Cost: \$1,659,385

The High-Content Imaging & Analysis Core is an integral part of the NCI-funded [U54 Center for Cancer Systems Biology](#): Systems Analysis of Stress-adapted Cancer Organelles (SASCO). This shared Research Core provides the three projects of the U54 Center with resources to analyze different biological samples using specialized highly multiplexed high-content imaging methods and to extract quantitative data from the images. The Core includes an experimental component led by Dr. Fallahi-Sichani, and a computational component led by Dr. Rohde.

Collaborative Pilot Project

University of Virginia Comprehensive Cancer Center
Single-cell analysis of the relationship between mitochondrial structure and metabolic phenotype in pancreatic cancer

This project seeks to identify mechanistic relationships between mitochondrial structure and metabolism across tumor types and exploit those relationships to identify new therapeutic interventions.

05/15/2024 – 05/14/2025
 Co-PIs: Kashatus, Fallahi-Sichani, and Bauer
 Total Cost: \$100,000

Molecular Genetics and Epigenetics Pilot Project

University of Virginia Comprehensive Cancer Center
Multiscale Computational and Experimental Framework for Analyzing Melanoma Cell Drug Responses through Stochastic Dynamics

This project aims to develop a stochastic modeling framework to analyze the heterogeneous dynamic responses of cancer cells to drug perturbations.

11/1/2024 – 10/31/2025
 PI: Shakeri
 Co-PIs: Fallahi-Sichani, Bekiranov
 Total Cost: \$42,500

Computational Genomics and Data Science Pilot Award

University of Virginia Comprehensive Cancer Center
Machine Learning of Molecular Predictors of Melanoma Metastasis via AP-1 State Heterogeneity and Stromal Dynamics

This project aims to systematically investigate the role of microenvironment-driven AP-1 state heterogeneity in regulating melanoma metastatic potential.

04/1/2025 – 03/30/2026
 PI: Xie, Co-PI: Fallahi-Sichani
 Co-Is: Slingluff and Ma
 Total Cost: \$25,500

DHART SPORE Developmental Research Program Award

University of Virginia Comprehensive Cancer Center
Exploiting SYK-mediated metabolic vulnerability to block NF1^{LoF} melanomas

This pilot project aims to test new combination strategies via co-inhibition of SYK and MEK kinases to block NF1^{LoF} melanoma tumors, and screen for actionable metabolic vulnerabilities mediated through SYK signaling as a strategy to maximize NF1^{LoF} melanoma cell killing.

11/1/2024 – 10/31/2025
 PI: Fallahi-Sichani
 Total Cost: \$75,000

C. Pending Projects Recommended for Funding:

N/A

D. Completed Projects/Awards:**R35-GM133404**

NIH/NIGMS
Decoding the logic of cellular signaling through the integration of dynamic, single-cell and multiplexed methods

This research program seeks to understand how cells process dynamic information from combinations of tightly regulated signaling pathways to modulate downstream transcription factor dynamics, and how such dynamics coordinate both context-dependent and stimulus-specific responses to environmental changes.

09/01/2019 – 08/14/2024
 PI: Fallahi-Sichani
 Total Cost: \$1,876,177

Melanoma Translational Research Team Pilot Project Award

University of Virginia Comprehensive Cancer Center
Pevonedistat in combination with MAPK inhibitors for the treatment of cutaneous melanoma

This project tests the preclinical efficacy of pharmacological induction of re-replication with pevonedistat, in combination with MAPK inhibitors, in blocking melanoma cells *in vitro* and *in vivo*.

01/01/2023 – 12/31/2023
 PI: Abbas
 Co-I: Fallahi-Sichani
 Total Cost: \$50,000

3 Cavaliers Seed Grant Program

05/01/2021 – 04/30/2023

University of Virginia
Dissecting the origins of heterogeneous cancer cellular interactions and responses to therapeutic perturbation

Co-PIs: Shakeri, Dolatshahi,
 Fallahi-Sichani
 Total Cost: \$60,000

The goal of this project is to integrate highly multiplexed single-cell measurements with new computational methods to identify the dynamics of heterogeneous cancer cell subpopulations and predict their phenotypic response trajectories to cancer drug perturbations.

W81XWH1810427

Department of Defense

Defining and targeting novel epigenetic vulnerabilities in drug-resistant melanomas

09/01/2018 – 12/14/2022

PI: Fallahi-Sichani

Total Cost: \$540,343

The goal of this project is to identify and target epigenetic vulnerabilities in genetically different NRAS and NF1-mutant melanomas.

Melanoma Research Grant

The Harry J. Lloyd Charitable Trust

Targeting Cell Plasticity to Overcome Resistance to Melanoma Therapies

07/01/2021 – 06/30/2022

PI: Fallahi-Sichani

Total Cost: \$125,000

The goal of this project is to uncover the mechanistic role of KDM1A and KDM4B in determining melanoma tumor cell plasticity in differentiation state as well as the expression of cell adhesion and mechanical barrier genes as a mechanism of resistance to melanoma therapies.

V Scholar Award

V Foundation for Cancer Research

Maximizing oncogene addiction in tumor cells by epigenetic modulation: pushing the limits of molecular targeted therapy

11/01/2017 – 06/01/2021

PI: Fallahi-Sichani

Total Cost: \$200,000

The goal of this pilot project was to develop an understanding of epigenetic modulations that regulate the state of BRAF dependency in a tumor cell.

K99/R00-CA194163

NIH/NCI

Adaptive regulation of cancer cell fate following oncogene inhibition

08/17/2015 – 04/30/2021

PI: Fallahi-Sichani

Total Cost: \$987,366

The goal of this project was to understand the biochemical rewiring mechanisms involved in adaptive resistance of BRAF-mutant cells to drugs that target the BRAF oncoprotein.

Turner-McConnell Fund for Drug Discovery

University of Michigan Rogel Cancer Center

Selective inhibition of NF1 loss-of-function driven oncogenic signaling

05/01/2019 – 12/31/2020

PI: Fallahi-Sichani

Total Cost: \$50,000

The goal of this project was to investigate a potentially novel opportunity to target NF1-mediated oncogenesis in melanoma using a newly developed compound, MTX-216.

Elsa Pardee Foundation Research Award

Elsa U. Pardee Foundation

Targeting the origins of phenotype switching to overcome heterogeneous drug-resistant tumor cells

01/01/2018 – 12/31/2018

PI: Fallahi-Sichani

Total Cost: \$203,350

The goal of this project was to develop computational models of transcriptional switching and phenotypic transitions during response of tumor cells to chemotherapies.

LSRF Postdoctoral Fellowship

Life Sciences Research Foundation

Regulation of apoptosis in an oncogene addiction setting

8/01/2013 – 7/31/2016

PI: Fallahi-Sichani

Total Cost: \$180,000

This study combined high throughput, multiplex biochemical measurement and computational modeling to understand the regulation of apoptosis in a BRAF^{V600E} oncogene addiction setting.

E. Fellowships/Grants for Trainees:

Audrey Kidd

NIGMS T32 Systems & Biomolecular Data Sciences Training Program,
University of Virginia

07/01/2024 – 06/30/2025

Kimberly Nguyen

NCI T32 Cancer Research Training Program, University of Virginia

07/01/2024 – 06/30/2025

Yonatan Degefu

NIGMS T32 Systems & Biomolecular Data Sciences Training Program,
University of Virginia

07/01/2023 – 06/30/2024

Magda Bujnowska

NCI T32 Cancer Research Training Program, University of Virginia

07/01/2023 – 06/30/2024

You (Henry) Gao

NIGMS Administrative Supplement to Support Undergraduate Summer
Research Experience, University of Virginia

05/15/2023 – 07/31/2023

Doug Baumann

Cancer Center Trainee Farrow Fellowship, University of Virginia

08/01/2020 – 07/31/2021

Mehwish Khaliq

NCI T32 Cancer Biology Training Postdoctoral Fellowship, University of
Michigan

05/01/2018 – 04/30/2020

Natacha Comandante-Lou

Rackham International Student Fellowship, University of Michigan

01/01/2018 – 04/30/2018

Cara Abecunas

Rackham Merit Fellowship, University of Michigan

09/01/2019 – 04/30/2023

PUBLICATIONS (GOOGLE SCHOLAR LIST)

(*Corresponding author; Underlined co-authors are Fallahi-Sichani lab trainees; *Equal contributions)

A. Peer-Reviewed Research Articles:

1. Abecunas C, Kidd AD, Jiang Y, Zong H, **Fallahi-Sichani M**[#]. Multivariate analysis of metabolic state vulnerabilities across diverse cancer contexts reveals synthetically lethal associations. *Cell Reports*. 2024 Sep 20;43(10):114775. doi: 10.1016/j.celrep.2024.114775. Epub ahead of print. PMID: 39305483.
2. Hsu J*, Nguyen KT*, Bujnowska M, Janes KA, **Fallahi-Sichani M**[#]. Iterative indirect immunofluorescence imaging in cultured cells, tissue sections, and metaphase chromosome spreads, *STAR Protocols*. 2024 Jul 11;5(3):103190. doi: 10.1016/j.xpro.2024.103190. PMID: 39002133; PMCID: PMC11301206.
3. Abecunas C, Whitehead C, Ziemke E, Baumann DG, Frankowski-McGregor C, Sebolt-Leopold J, **Fallahi-Sichani M**[#]. Loss of NF1 in Melanoma Confers Sensitivity to SYK Kinase Inhibition. *Cancer Research*. 2023 Jan 18;83(2):316-331. doi: 10.1158/0008-5472.CAN-22-0883. PMID: 36409827; PMCID: PMC9845987.

4. Comandante-Lou N*, Baumann DG*, **Fallahi-Sichani M[#]**. AP-1 transcription factor network explains diverse patterns of cellular plasticity in melanoma cells. *Cell Reports*. 2022 Aug 2;40(5):111147. doi: 10.1016/j.celrep.2022.111147. PMID: 35926467; PMCID: PMC9395172.
5. Khalig M, Manikkam M, Martinez ED, **Fallahi-Sichani M[#]**. Epigenetic modulation reveals differentiation state specificity of oncogene addiction. *Nature Communications*. 2021 Mar 9;12(1):1536. doi: 10.1038/s41467-021-21784-2. PMID: 33750776; PMCID: PMC7943789.
6. Comandante-Lou N, Khalig M, Venkat D, Manikkam M, **Fallahi-Sichani M[#]**. Phenotype-based probabilistic analysis of heterogeneous responses to cancer drugs and their combination efficacy. *PLoS Computational Biology*. 2020 Feb 21;16(2):e1007688. doi: 10.1371/journal.pcbi.1007688. PMID: 32084135; PMCID: PMC7055924.
7. Shcherbina A, Larouche J, Fraczek P, Yang BA, Brown LA, Markworth JF, Chung CH, Khalig M, de Silva K, Choi JJ, **Fallahi-Sichani M**, Chandrasekaran S, Jang YC, Brooks SV, Aguilar CA[#]. Dissecting Murine Muscle Stem Cell Aging through Regeneration Using Integrative Genomic Analysis. *Cell Reports*. 2020 Jul 28;32(4):107964. doi: 10.1016/j.celrep.2020.107964. PMID: 32726628; PMCID: PMC8025697.
8. **Fallahi-Sichani M[#]**, Becker V, Izar B, Baker GJ, Lin JR, Boswell SA, Shah P, Rotem A, Garraway LA, Sorger PK[#]. Adaptive resistance of melanoma cells to RAF inhibition via reversible induction of a slowly dividing de-differentiated state. *Molecular Systems Biology*. 2017 Jan 9;13(1):905. doi: 10.15252/msb.20166796. PMID: 28069687; PMCID: PMC5248573.
9. Lin JR, **Fallahi-Sichani M**, Chen JY, Sorger PK[#]. Cyclic Immunofluorescence (CyclIF), A Highly Multiplexed Method for Single-cell Imaging. *Current Protocols in Chemical Biology*. 2016 Dec 7;8(4):251-264. doi: 10.1002/cpch.14. PMID: 27925668; PMCID: PMC5233430.
10. Tirosh I, Izar B, Prakadan SM, Wadsworth MH 2nd, Treacy D, Trombetta JJ, Rotem A, Rodman C, Lian C, Murphy G, **Fallahi-Sichani M**, Dutton-Regester K, Lin JR, Cohen O, Shah P, Lu D, Genshaft AS, Hughes TK, Ziegler CG, Kazer SW, Gaillard A, Kolb KE, Villani AC, Johannessen CM, Andreev AY, Van Allen EM, Bertagnolli M, Sorger PK, Sullivan RJ, Flaherty KT, Frederick DT, Jané-Valbuena J, Yoon CH, Rozenblatt-Rosen O, Shalek AK, Regev A[#], Garraway LA[#]. Dissecting the multicellular ecosystem of metastatic melanoma by single-cell RNA-seq. *Science*. 2016 Apr 8;352(6282):189-96. doi: 10.1126/science.aad0501. PMID: 27124452; PMCID: PMC4944528.
11. Moerke N[#], **Fallahi-Sichani M**. Reverse Phase Protein Arrays for Compound Profiling. *Current Protocols in Chemical Biology*. 2016 Sep 13;8(3):179-196. doi: 10.1002/cpch.9. PMID: 27622568; PMCID: PMC5613289.
12. Lin JR, **Fallahi-Sichani M**, Sorger PK[#]. Highly multiplexed imaging of single cells using a high-throughput cyclic immunofluorescence method. *Nature Communications*. 2015 Sep 24;6:8390. doi: 10.1038/ncomms9390. PMID: 26399630; PMCID: PMC4587398.
13. **Fallahi-Sichani M**, Moerke NJ, Niepel M, Zhang T, Gray NS, Sorger PK[#]. Systematic analysis of BRAF(V600E) melanomas reveals a role for JNK/c-Jun pathway in adaptive resistance to drug-induced apoptosis. *Molecular Systems Biology*. 2015 Mar 26;11(3):797. doi: 10.15252/msb.20145877. PMID: 25814555; PMCID: PMC4380931.
14. **Fallahi-Sichani M**, Honarnejad S, Heiser LM, Gray JW, Sorger PK[#]. Metrics other than potency reveal systematic variation in responses to cancer drugs. *Nature Chemical Biology*. 2013 Nov;9(11):708-14. doi: 10.1038/nchembio.1337. Epub 2013 Sep 8. PMID: 24013279; PMCID: PMC3947796.
15. **Fallahi-Sichani M**, Kirschner DE[#], Linderman JJ[#]. NF-κB Signaling Dynamics Play a Key Role in Infection Control in Tuberculosis. *Frontiers in Physiology*. 2012 Jun 6;3:170. doi: 10.3389/fphys.2012.00170. PMID: 22685435; PMCID: PMC3368390.

16. **Fallahi-Sichani M**, Flynn JL, Linderman JJ[#], Kirschner DE[#]. Differential risk of tuberculosis reactivation among anti-TNF therapies is due to drug binding kinetics and permeability. *Journal of Immunology*. 2012 Apr 1;188(7):3169-78. doi: 10.4049/jimmunol.1103298. Epub 2012 Feb 29. PMID: 22379032; PMCID: PMC3311778.
17. **Fallahi-Sichani M**, El-Kebir M, Marino S, Kirschner DE[#], Linderman JJ[#]. Multiscale computational modeling reveals a critical role for TNF- α receptor 1 dynamics in tuberculosis granuloma formation. *Journal of Immunology*. 2011 Mar 15;186(6):3472-83. doi: 10.4049/jimmunol.1003299. Epub 2011 Feb 14. PMID: 21321109; PMCID: PMC3127549.
18. **Fallahi-Sichani M**, Schaller MA, Kirschner DE, Kunkel SL, Linderman JJ[#]. Identification of key processes that control tumor necrosis factor availability in a tuberculosis granuloma. *PLoS Computational Biology*. 2010 May 6;6(5):e1000778. doi: 10.1371/journal.pcbi.1000778. PMID: 20463877; PMCID: PMC2865521.
19. **Fallahi-Sichani M**, Linderman JJ[#]. Lipid raft-mediated regulation of G-protein coupled receptor signaling by ligands which influence receptor dimerization: a computational study. *PLoS One*. 2009 Aug 11;4(8):e6604. doi: 10.1371/journal.pone.0006604. PMID: 19668374; PMCID: PMC2719103.
20. Mohammadi Y, Soleimani M[#], **Fallahi-Sichani M**, Gazme A, Haddadi-Asl V, Arefian E, Kiani J, Moradi R, Atashi A, Ahmadbeigi N. Nanofibrous poly(epsilon-caprolactone)/poly(vinyl alcohol)/chitosan hybrid scaffolds for bone tissue engineering using mesenchymal stem cells. *International Journal of Artificial Organs*. 2007 Mar;30(3):204-11. doi: 10.1177/039139880703000305. PMID: 17417759.
21. **Fallahi-Sichani M**, Soleimani M[#], Najafi SM, Kiani J, Arefian E, Atashi A. In vitro differentiation of cord blood unrestricted somatic stem cells expressing dopamine-associated genes into neuron-like cells. *Cell Biology International*. 2007 Mar;31(3):299-303. doi: 10.1016/j.cellbi.2006.11.011. Epub 2006 Nov 19. PMID: 17196845.

B. Invited Peer-Reviewed Review Articles:

22. **Khalig M, Fallahi-Sichani M[#]**. Epigenetic Mechanisms of Escape from BRAF Oncogene Dependency. *Cancers* (Basel). 2019 Oct 1;11(10):1480. doi: 10.3390/cancers11101480. PMID: 31581557; PMCID: PMC6826668.
23. Keenan AB, Jenkins SL, Jagodnik KM, Koplev S, He E, Torre D, Wang Z, Dohlman AB, Silverstein MC, Lachmann A, Kuleshov MV, Ma'ayan A[#], Stathias V, Terryn R, Cooper D, Forlin M, Koleti A, Vidovic D, Chung C, Schürer SC, Vasiliauskas J, Pilarczyk M, Shamsaei B, Fazel M, Ren Y, Niu W, Clark NA, White S, Mahi N, Zhang L, Kouril M, Reichard JF, Sivaganesan S, Medvedovic M, Meller J, Koch RJ, Birtwistle MR, Iyengar R, Sobie EA, Azeloglu EU, Kaye J, Osterloh J, Haston K, Kalra J, Finkbiener S, Li J, Milani P, Adam M, Escalante-Chong R, Sachs K, Lenail A, Ramamoorthy D, Fraenkel E, Daigle G, Hussain U, Coye A, Rothstein J, Sareen D, Ornelas L, Banuelos M, Mandefro B, Ho R, Svendsen CN, Lim RG, Stocksedale J, Casale MS, Thompson TG, Wu J, Thompson LM, Dardov V, Venkatraman V, Matlock A, Van Eyk JE, Jaffe JD, Papanastasiou M, Subramanian A, Golub TR, Erickson SD, **Fallahi-Sichani M**, Hafner M, Gray NS, Lin JR, Mills CE, Muhlich JL, Niepel M, Shamu CE, Williams EH, Wrobel D, Sorger PK, Heiser LM, Gray JW, Korkola JE, Mills GB, LaBarge M, Feiler HS, Dane MA, Bucher E, Nederlof M, Sudar D, Gross S, Kilburn DF, Smith R, Devlin K, Margolis R, Derr L, Lee A, Pillai A. The Library of Integrated Network-Based Cellular Signatures NIH Program: System-Level Cataloging of Human Cells Response to Perturbations. *Cell Systems*. 2018 Jan 24;6(1):13-24. doi: 10.1016/j.cels.2017.11.001. Epub 2017 Nov 29. PMID: 29199020; PMCID: PMC5799026.
24. Kirschner DE[#], Hunt CA, Marino S, **Fallahi-Sichani M**, Linderman JJ[#]. Tuneable resolution as a systems biology approach for multi-scale, multi-compartment computational models. *Wiley*

Interdisciplinary Reviews - Systems Biology and Medicine. 2014 Jul-Aug;6(4):289-309. doi: 10.1002/wsbm.1270. Epub 2014 May 9. PMID: 24810243; PMCID: PMC4102180.

C. Invited Book Chapters:

25. Comandante-Lou N, **Fallahi-Sichani M[#]**. Models of Cancer Drug Discovery and Response to Therapy, In Wolkenhauer O (Ed.), ***Systems Medicine: Integrative, Qualitative and Computational Approaches***. Academic Press, 2021. ISBN 9780128160787. doi: 10.1016/B978-0-12-801238-3.11356-X.
26. **Fallahi-Sichani M**, Marino S, Flynn JL, Linderman JJ[#], Kirschner DE[#]. A systems biology approach for understanding granuloma formation and function in tuberculosis, In McFadden J, Beste D, Kierzek A (Ed.), ***Systems biology of tuberculosis***. Springer, 2013. ISBN 978-1-4614-4966-9. doi: 10.1007/978-1-4614-4966-9_7.
27. Marino S, **Fallahi-Sichani M**, Linderman JJ, Kirschner DE[#]. Mathematical models of anti-TNF therapies and their correlation with tuberculosis, In Pathak Y, Benita S (Ed.), ***Antibody-mediated drug delivery systems: Concepts, Technology and Applications***. John Wiley and Sons, 2012. ISBN 978-0-470-61281-1. doi: 10.1002/9781118229019.ch5.

CONFERENCE ABSTRACTS

(All abstracts were presented, [#]Corresponding author, *Presenting co-author, Underlined co-authors are Fallahi-Sichani lab trainees)

A. Oral Presentations:

1. Quesada L*, **Fallahi-Sichani M[#]**. Multivariate modeling uncovers differentiation state-associated epigenetic dependencies in melanoma. FASEB Meeting on Cell Signaling in Cancer: From Mechanisms to Therapy 2024, Tucson, Arizona.
2. Bujnowska M*, Manikkam M, **Fallahi-Sichani M[#]**. The role of AP-1 transcription factors in regulation of transcriptional plasticity in melanoma cells. Commonwealth of Virginia Cancer Research Conference (CVCRC) 2023, Charlottesville, VA.
3. Degefu Y*, **Fallahi-Sichani M[#]**. Identifying mechanistic regulators of the AP-1 state heterogeneity via computational modeling and multiplexed single-cell analysis. Commonwealth of Virginia Cancer Research Conference (CVCRC) 2023, Charlottesville, VA.
4. Abecunas C*, **Fallahi-Sichani M[#]**. Systematic analysis reveals metabolic state-specific gene vulnerabilities through conditional synthetic lethality. International Conference on Systems Biology (ICSB) 2023, Hartford, CT.
5. Camacho LQ*, **Fallahi-Sichani M[#]**. Differentiation state-specific patterns of histone modifications uncover new epigenetic vulnerabilities in melanoma. International Conference on Systems Biology (ICSB) 2023, Hartford, CT.
6. Lou NC, Baumann D, **Fallahi-Sichani M^{**}**. AP-1 transcription factor network controls diverse patterns of cell state plasticity. Biomedical Engineering Society (BMES) – Cell and Molecular Bioengineering Conference 2023, Indian Wells, CA.
7. Abecunas C*, Whitehead C, Ziemke E, Baumann D, Frankowski-McGregor C, Sebolt-Leopold J, **Fallahi-Sichani M[#]**. Systematic analysis uncovers SYK dependency in NF1^{LoF} melanoma cells. Biomedical Engineering Society (BMES) Annual Meeting 2022, San Antonio, TX.
8. Lou NC*, Baumann D, **Fallahi-Sichani M[#]**. AP-1 Transcription Factor Network Explains Diverse Patterns of Cellular Plasticity in Melanoma. Biomedical Engineering Society (BMES) Annual Meeting 2022, San Antonio, TX.

9. Abecunas C*, Whitehead C, Ziemke E, Sebolt-Leopold J, **Fallahi-Sichani M[#]**. Multi-targeted kinase inhibitor MTX-216 exploits dependency on SYK to selectively block NF1^{LoF} melanomas. Biomedical Engineering Society (BMES) Annual Meeting 2021, Orlando, FL.
10. Lou NC*, Baumann D, **Fallahi-Sichani M[#]**. The AP-1 Transcription Factor Network Links Heterogeneity in Melanoma Differentiation State to the Diversity of MAPK Inhibitor-Induced Adaptive Responses. Biomedical Engineering Society (BMES) Annual Meeting 2021, Orlando, FL.
11. Khalig M, Manikkam M, Martinez ED, **Fallahi-Sichani M[#]**. Epigenetic Modulation Extends the Oncogene Addiction Paradigm on the Basis of Tumor Cell Differentiation State. Biomedical Engineering Society (BMES) Annual Meeting 2020 (Virtual Conference).
12. Lou NC*, Baumann D, **Fallahi-Sichani M[#]**. The AP-1 Transcription Factor Network Links Heterogeneity in Melanoma Differentiation State to the Diversity of MAPK Inhibitor-Induced Adaptive Responses. Biomedical Engineering Society (BMES) Annual Meeting 2020 (Virtual Conference).
13. Abecunas C*, Whitehead C, Ziemke E, Sebolt-Leopold J, **Fallahi-Sichani M[#]**. Unveiling the mechanism of action of MTX-216 in overcoming drug resistance in NF1-mutant melanomas. Biomedical Engineering Society (BMES) Annual Meeting 2020 (Virtual Conference).
14. Abecunas C*, Whitehead C, Leopold J, **Fallahi-Sichani M[#]**. Selective inhibition of NF1 loss-of-function driven oncogenic signaling in melanomas. Biomedical Engineering Society (BMES) Annual Meeting 2019, Philadelphia, PA.
15. Lou NC*, Venkat D, **Fallahi-Sichani M[#]**. Probabilistic phenotype metrics for characterizing heterogenous tumor cell drug responses and their combined interactions. Biomedical Engineering Society (BMES) Annual Meeting 2019, Philadelphia, PA.
16. **Fallahi-Sichani M[#]**. Maximizing oncogene addiction in tumor cells by epigenetic modulation: Pushing the limits of molecularly targeted therapy. International Conference on Epigenetics and Bioengineering, 2017, Miami, FL.
17. **Fallahi-Sichani M***, Becker V, Izar B, Baker GJ, Lin JR, Boswell SA, Garraway LA, Sorger PK[#]. Single-cell analysis reveals an adaptive, slowly-dividing, de-differentiated, drug-resistant cell state selectively inhibitable by drug combinations. American Association for Cancer Research (AACR) Precision Medicine Series: Opportunities and Challenges of Exploiting Synthetic Lethality in Cancer, 2017, San Diego, CA.
18. **Fallahi-Sichani M***, Becker V, Baker GJ, Boswell SA, Everley RA, Lin JR, Sorger PK[#]. Overcoming adaptive resistance and fractional response of cancer cells to targeted therapy. BMES (Biomedical Engineering Society) Annual Meeting 2016, Minneapolis, MN.
19. **Fallahi-Sichani M***, Becker V, Boswell SA, Sorger PK[#]. Adaptive regulation of cancer cell fate following targeted inhibition of the oncogenic pathway. BMES (Biomedical Engineering Society) Annual Meeting 2015, Tampa, FL.
20. **Fallahi-Sichani M***, Moerke NJ, Lin JR, Becker V, Boswell SA, Sorger PK[#]. Systematic Analysis of Adaptive resistance and fractional responses of melanoma cancer cells to RAF/MEK inhibition. AIChE (American Institute of Chemical Engineers) Annual Meeting 2015, Salt Lake City, UT.
21. **Fallahi-Sichani M***, Moerke NJ, Niepel M, Zhang T, Gray NS, Sorger PK[#]. Systematic analysis of drug-induced adaptive responses in melanoma. BMES (Biomedical Engineering Society) Annual Meeting 2014, San Antonio, TX.
22. **Fallahi-Sichani M***, Honarnejad S, Heiser LM, Gray JW, Sorger PK[#]. Comparing drug activity across cell line banks reveals systematic variation in properties other than potency. International Conference on Systems Biology of Human Disease (SBHD) 2013, Heidelberg, Germany.

23. **Fallahi-Sichani M***, Honarnejad S, Heiser LM, Gray JW, Sorger PK[#]. Metrics other than potency reveal systematic variation in responses to cancer drugs. Library of Integrated Network-based Cellular Signatures (LINCS) Symposium 2013, Broad Institute, Cambridge, MA.
24. **Fallahi-Sichani M***, Kirschner DE, Linderman JJ[#]. A systems biology approach to identify immune targets that control tuberculosis granuloma function. AIChE (American Institute of Chemical Engineers) Annual Meeting 2011, Minneapolis, MN.
25. **Fallahi-Sichani M***, Kirschner DE, Linderman JJ[#]. The dynamics of TNF signaling control tuberculosis granuloma formation. The 5th Annual q-bio Conference on Cellular Information Processing, August 2011, Santa Fe, NM.
26. **Fallahi-Sichani M***, El-Kebir M, Marino S, Kirschner DE, Linderman JJ[#]. Experimental and mathematical approaches to multi-scale analysis of tumor necrosis factor-regulated immune response to tuberculosis. AIChE (American Institute of Chemical Engineers) Annual Meeting 2010, Salt Lake City, UT.
27. Harris LA*, Hogg JS, **Fallahi-Sichani M**, Linderman JJ, Kirschner DE, Faeder JR[#]. A novel computational architecture for construction and execution of modular, multi-scale, multi-algorithm dynamical models. AIChE (American Institute of Chemical Engineers) Annual Meeting 2010, Salt Lake City, UT.
28. **Fallahi-Sichani M***, Schaller MA, Kirschner DE, Kunkel SL, Linderman JJ[#]. Model-based analysis and quantitative measurement of key components of tumor necrosis factor trafficking in a tuberculosis granuloma. AIChE (American Institute of Chemical Engineers) Annual Meeting 2009, Nashville, TN.
29. **Fallahi-Sichani M***, Linderman JJ[#]. Regulation of G-protein signaling by receptor organization: The role of dimerization and lipid rafts. BMES (Biomedical Engineering Society) Annual Meeting 2008, St. Louis, MO.

B. Poster Presentations:

30. Kidd AD*, Baumann D, Bujnowska M, Zunder E, **Fallahi-Sichani M[#]**. Single-cell trajectory analysis reveals AP-1 dependent differentiation state heterogeneity in melanoma responses to MAPK-targeted therapies. Systems Approaches to Cancer Biology (SACB) Meeting 2025, Aurora, CO.
31. Degefu Y*, **Fallahi-Sichani M[#]**. Identifying mechanistic regulators of the AP-1 state heterogeneity via computational modeling and multiplexed single-cell analysis. Systems Approaches to Cancer Biology (SACB) Meeting 2025, Aurora, CO.
32. Quesada L*, Faieq K, **Fallahi-Sichani M[#]**. Multivariate modeling uncovers differentiation state-associated epigenetic dependencies in melanoma. Systems Approaches to Cancer Biology (SACB) Meeting 2025, Aurora, CO.
33. Nguyen*, **Fallahi-Sichani M[#]**. Identifying the microenvironmental drivers of AP-1-mediated differentiation state heterogeneity in primary melanoma tissues. Systems Approaches to Cancer Biology (SACB) Meeting 2025, Aurora, CO.
34. Chitforoushzadeh Z*, Hsu J, Alvarez-Yela AC, Gerardo M, Pathan NS, Stukenberg PT, Rohde GK, Janes KA, **Fallahi-Sichani M[#]**. Optimizing Iterative Indirect Immunofluorescence Imaging (4i) for High-Resolution Multiplexed Protein Analysis in Chromosome Spreads: Implications for Cancer Research. Systems Approaches to Cancer Biology (SACB) Meeting 2025, Aurora, CO.
35. Hsu J*, Nguyen K, Janes K, **Fallahi-Sichani M[#]**. Optimized protocol for 4i in FFPE tissue sections and metaphase chromosome spreads. 2024 Society of Biomolecular Imaging and Informatics (SBI2) Conference, Boston, MA.

36. Tran LQ*, Nguyen KT, **Fallahi-Sichani M[#]**. Tissue 4i: Insights Into the Spatial Distribution of Key Melanoma Markers. Annual Biomedical Research Conference for Minoritized Scientists (ABRCMS) 2024, Pittsburgh, PA.
37. Quesada L*, **Fallahi-Sichani M[#]**. Multivariate modeling uncovers differentiation state-associated epigenetic dependencies in melanoma. FASEB Meeting on Cell Signaling in Cancer: From Mechanisms to Therapy 2024, Tucson, Arizona.
38. Abecunas C, **Fallahi-Sichani M^{**}**. Uncovering metabolic state-specific cancer therapeutic vulnerabilities through conditional synthetic lethality. 2024 BMES CMBE Conference, San Juan, Puerto Rico.
39. Quesada L*, **Fallahi-Sichani M[#]**. Differentiation state-specific patterns of histone modifications uncover new epigenetic vulnerabilities in melanoma. Commonwealth of Virginia Cancer Research Conference (CVCRC) 2023, Charlottesville, VA.
40. Nguyen KT*, Hsu J, Janes K, **Fallahi-Sichani M[#]**. An optimized iterative indirect immunofluorescence imaging protocol for profiling of cellular states in tissues. Commonwealth of Virginia Cancer Research Conference (CVCRC) 2023, Charlottesville, VA.
41. Bujnowska M*, Manikkam M, **Fallahi-Sichani M[#]**. The role of AP-1 transcription factors in regulation of transcriptional plasticity in melanoma cells. Cold Spring Harbor Laboratory (CSHL) Meeting on Cell State Conversions 2023.
42. Nguyen KT*, Hsu J, Janes K, **Fallahi-Sichani M[#]**. An optimized iterative indirect immunofluorescence imaging protocol for profiling of cellular states in tissues. Cold Spring Harbor Laboratory (CSHL) Meeting on Cell State Conversions 2023.
43. Chea G*, Degefu Y, **Fallahi-Sichani M[#]**. Inferring the role of AP-1 protein dimerization in melanoma differentiation state heterogeneity via multivariate modeling, Biomedical Engineering Society (BMES) Annual Meeting 2023, Seattle, WA.
44. Hsu J*, Nguyen K, Janes K, **Fallahi-Sichani M[#]**. Optimized iterative indirect immunofluorescence imaging protocols for FFPE tissue sections and metaphase chromosome spreads. Cancer Systems Biology Consortium (CSBC) Annual Meeting 2023, Bethesda, MD.
45. Degefu Y*, **Fallahi-Sichani M[#]**. Identifying mechanistic regulators of the AP-1 state heterogeneity via computational modeling and multiplexed single-cell analysis. International Conference on Systems Biology (ICSB) 2023, Hartford, CT.
46. Gao Y*, Camacho LQ, **Fallahi-Sichani M[#]**. Uncovering chromatin regulator co-dependencies in melanoma through the integration of CRISPR screen and transcriptomics data, Biomedical Engineering Society (BMES) Annual Meeting 2023, Seattle, WA.
47. Tang A*, Degefu Y, **Fallahi-Sichani M[#]**. The Role of miRNAs and Their Target Genes in Differentiation State of Thyroid Carcinomas. Annual Biomedical Research Conference for Minoritized Scientists (ABRCMS) 2022, Anaheim, CA.
48. Abecunas C*, Whitehead C, Ziemke E, Baumann D, Frankowski-McGregor C, Sebolt-Leopold J, **Fallahi-Sichani M[#]**. Systematic analysis uncovers SYK dependency in NF1^{LoF} melanoma cells. Systems Approaches to Cancer Biology (SACB) Meeting 2022, Marine Biological Laboratory, Woods Hole, MA.
49. Tang A*, Degefu Y, **Fallahi-Sichani M[#]**. The Role of miRNAs and Their Target Genes in Differentiation State of Thyroid Carcinomas. Biomedical Engineering Society (BMES) Annual Meeting 2022, San Antonio, TX.

50. Quesada Camacho LF*, **Fallahi-Sichani M[#]**. Differentiation state-specific patterns of histone modifications uncover new epigenetic vulnerabilities in melanoma. NCI Junior Investigator Annual Meeting (Virtual), 2022.
51. Khalig M, Manikkam M, Martinez ED, **Fallahi-Sichani M[#]**. An integrative screen to identify epigenetic modulators of phenotypic heterogeneity in cancer cells. Keystone Symposium on Modern Phenotypic Drug Discovery: From Chemical Biology to Therapeutics 2022, Denver, CO.
52. Abecunas C*, Whitehead C, Leopold J, **Fallahi-Sichani M[#]**. Selective Inhibition of NF1 Loss-of-Function Driven Oncogenic Signaling in Melanomas. American Association for Cancer Research (AACR) Annual Meeting 2020, San Diego, CA.
53. Lou NC*, Venkat D, **Fallahi-Sichani M[#]**. Phenotypic Kinetic Metrics to Characterize Cancer Cell Drug Response. Biomedical Engineering Society (BMES) Annual Meeting 2018, Atlanta, GA.
54. Khalig M*, Manikkam M, **Fallahi-Sichani M[#]**. Single-cell multiplex signature of histone modifications regulated by histone-modifying enzymes in BRAFV600E-mutant melanoma cells. Cancer Biology Program Retreat, University of Michigan, 2018, Ann Arbor, MI.
55. **Fallahi-Sichani M***, Becker V, Izar B, Baker GJ, Lin JR, Boswell SA, Garraway LA, Sorger PK[#]. Single-cell analysis reveals an adaptive, transiently heritable, slowly dividing, drug-resistant state inhibitable by drug combinations. American Association for Cancer Research (AACR) Annual Meeting 2017, Washington, DC.
56. **Fallahi-Sichani M***, Moerke NJ, Niepel M, Zhang T, Gray NS, Sorger PK[#]. Single-cell analysis of adaptive resistance and fractional responses of melanoma cells to RAF/MEK inhibition. American Association for Cancer Research (AACR) Annual Meeting 2015, Philadelphia, PA.
57. **Fallahi-Sichani M***, Moerke NJ, Niepel M, Zhang T, Gray NS, Sorger PK[#]. Systematic analysis of drug-induced adaptive responses in melanoma. The FEBS-EMBO 2014 Conference, Paris, France.
58. **Fallahi-Sichani M***, Honarnejad S, Heiser LM, Gray JW, Sorger PK[#]. Metrics other than potency reveal systematic variation in responses to cancer drugs. American Association for Cancer Research (AACR) Annual Meeting 2014, San Diego, CA.
59. **Fallahi-Sichani M***, Moerke NJ, Dastur A, Benes CH, Sorger PK[#]. A systems pharmacology approach to understanding differential responsiveness of melanoma cancer cells to BRAF inhibition. Biomedical Engineering Society (BMES) Annual Meeting 2013, Seattle, WA.
60. **Fallahi-Sichani M***, Moerke NJ, Dastur A, Benes CH, Sorger PK[#]. A systems biology approach to understanding differential phenotypic outcome of BRAF(V600E) inhibition in melanoma cells. American Association for Cancer Research (AACR) Annual Meeting 2013, Washington, DC.
61. **Fallahi-Sichani M***, Sorger PK[#]. Multi-parametric analysis of dose-response behavior in cancer cells. Library of Integrated Network-based Cellular Signatures (LINCS) 2012 Consortium Meeting, NIH, Bethesda, MD.
62. **Fallahi-Sichani M***, El-Kebir M, Marino S, Kirschner DE, Linderman JJ[#]. Multi-scale modeling of tumor necrosis factor-regulated granuloma formation in tuberculosis. Biomedical Engineering Society (BMES) Annual Fall Meeting 2010, Austin, TX.
63. **Fallahi-Sichani M***, Schaller MA, Kirschner DE, Kunkel SL, Linderman JJ[#]. Toward a multi-scale model of tumor necrosis factor regulated immune response to tuberculosis. Systems Biology Symposium 2009, Ann Arbor, MI.
64. **Fallahi-Sichani M***, Schaller MA, Kunkel SL, Linderman JJ[#]. Quantification of processes that control tumor necrosis factor availability in a tuberculosis granuloma. The CMPI Symposium on Multi-Scale Modeling of Host/Pathogen Interactions 2009, Pittsburgh, PA.

INVITED LECTURES AND SYMPOSIUM PRESENTATIONS**A. Invited as a UVA Faculty Member (2020-Present):**

1. Department of Cell Biology, University of Virginia, April 2025.
2. Department of Pathology, University of Virginia, January 2025.
3. Department of Bioinformatics, UT Southwestern Medical Center, January 2025.
4. FASEB Conference on Cell Signaling in Cancer: From Mechanism to Therapy, Tucson, Arizona, June 2024.
5. Genome Sciences Seminar Series, Center for Public Health Genomics, University of Virginia, December 2023.
6. Voices for Victory program panel, V Foundation for Cancer Research, Middleburg, VA, April 2023.
7. Systems Approaches to Cancer Biology (SACB) Meeting, Marine Biological Laboratory, Woods Hole, MA, October 2022.
8. Center for Biosystems Science and Engineering, Indian Institute of Science, Bangalore, India, October 2022.
9. Melanoma and Skin Cancer Center of Excellence, Moffitt Cancer Center, April 2022.
10. Department of Biochemistry and Molecular Genetics, University of Virginia, April 2022.
11. Institute for Computational Medicine Distinguished Seminar Series, Johns Hopkins University, November 2021.
12. Cancer Biology Program, University of Virginia Cancer Center, November 2021.
13. Quantitative Systems Biology Center, Vanderbilt University, January 2021.
14. Department of Pathology, University of Virginia, December 2020.
15. Department of Biomedical Engineering, Purdue University, September 2020
16. Department of Microbiology, Immunology and Cancer Biology, University of Virginia, September 2020.

B. Invited as a Univ. of Michigan Faculty Member (2017-2020):

17. Department of Biomedical Engineering, University of Virginia, August 2019.
18. Rogel Cancer Center Basic Science Retreat, University of Michigan, June 2019.
19. Department of Bioengineering, University of Maryland, College Park, November 2018.
20. Cancer Biology Program Retreat, University of Michigan, September 2017.

C. Invited as a Postdoctoral Fellow (2012-2017):

21. Department of Systems Biology, University of Texas MD Anderson Cancer Center, May 2016.
22. Department of Chemical and Biological Engineering, Northwestern University, March 2016.
23. Department of Bioengineering, University of California, San Diego, February 2016.
24. Institute for Molecular Engineering, University of Chicago, February 2016.
25. Department of Biomedical Engineering, University of North Carolina and North Carolina State University, February 2016.
26. Department of Bioengineering, University of Washington, Seattle, February 2016.
27. Department of Chemical and Biomolecular Engineering, Johns Hopkins University, February 2016.
28. BioFrontiers Institute, University of Colorado, Boulder, January 2016.
29. School of Chemical and Biomolecular Engineering, Georgia Tech, Atlanta, January 2016.
30. Department of Biomedical Engineering, University of Michigan, Ann Arbor, January 2016.
31. Department of Developmental and Cell Biology, University of California, Irvine, January 2016.
32. Department of Biomedical Engineering, Rensselaer Polytechnic Institute, Troy, NY, November 2015.
33. 13th Annual Discovery on Target Meeting (Quantitative Systems Pharmacology track), Boston, MA, September 2015.
34. Conference on "Targeting Cancer Cell Proliferation & Metabolism Networks", Mathematical Biosciences Institute (MBI), Ohio State University, March 2015.

D. Invited as a PhD Student (2007-2012):

1. Distinguished Young Scholars Summer Seminar Series, Department of Chemical Engineering, University of Washington, Seattle, July 2012.
2. Department of Mathematics, University of British Columbia, Vancouver, March 2011.

PROFESSIONAL MEMBERSHIPS

Member, Cancer Systems Biology Consortium (CSBC)	2021 - Present
Member, American Association for Cancer Research (AACR)	2013 - Present
Member, Society for Biological Engineering	2011 - Present
Member, Biomedical Engineering Society (BMES)	2008 - Present
Member, BMES Cellular and Molecular Bioengineering (CMBE) Special Interest Group	2017 - Present
Member, American Institute of Chemical Engineers (AIChE)	2008 - Present

OTHER PROFESSIONAL ACTIVITIES**A. Editorial Board Membership and Peer-Review Service:**

Associate Editor and Editorial Board Member, IET Systems Biology	2021 - Present
Peer-review for the following Research Journals: Nature Chemical Biology, Cell Reports, Nature Communications, Science Signaling, Biophysical Journal, Cancer Research, PLoS Computational Biology, Bioinformatics, British Journal of Cancer, Communications Biology, Journal of Theoretical Biology, European Journal of Pharmacology, PLoS ONE, IEEE/ACM Transactions on Computational Biology and Bioinformatics, Cell Communication and Signaling	2017 - Present
Topic Editor, Frontiers in Bioinformatics: "Current advances of computational methods for tissue multiplexed imaging in research and diagnosis"	2023 - 2024

B. Study Sections and Grant Review Panels:

Temporary member, NIH Study Section – Gene Regulation in Cancer (GRIC)	February 2025
Temporary member, NIH Study Section – Gene Regulation in Cancer (GRIC)	February 2024
Temporary member, Florida Department of Health Biomedical Research Programs	October 2023
Temporary member, NIH Study Section – Gene Regulation in Cancer (GRIC)	June 2023
integrated Translational Health Research Institute of Virginia (iTHRIV) Scholars Program	February 2023
Temporary member, Florida Department of Health Biomedical Research Programs	October 2022
Temporary member, Florida Department of Health Biomedical Research Programs	October 2021

C. Conference Organization, Session Chair and Abstract Review Committees:

Track Chair for Bioinformatics, Computational and Systems Biology, Biomedical Engineering Society (BMES) Annual Meeting (Baltimore, MD)	2024
Planning Committee, NIH Cancer Systems Biology Consortium (CSBC) and Metastasis Research Network (MetNet) Annual Investigators Meeting (UCSF; San Francisco, CA)	2024
Award Review Committee, BMES Cell and Molecular Bioengineering (CMBE) Conference	2023

Abstract Review Committee, Biomedical Engineering Society (BMES) Annual Meeting, Bioinformatics and Systems Biology Track	2017 - 2022
Planning Committee, Commonwealth of Virginia Cancer Research Conference	2023
Platform Session Co-Chair, Biomedical Engineering Society (BMES) Annual Meeting (San Antonio, TX) – Session: “Multi-Scale Modeling”	2022
Platform Session Co-Chair, Biomedical Engineering Society (BMES) Annual Meeting (Virtual) – Session: “Computational Modeling of Cancer”	2020
Platform Session Co-Chair, Biomedical Engineering Society (BMES) Annual Meeting (Philadelphia, PA) – Session: “Computational Modeling of Cancer”	2019
Platform Session Co-Chair, Biomedical Engineering Society (BMES) Annual Meeting (Phoenix, AZ) – Session: “Computational Modeling of Cancer”	2017
Platform Session Chair, International Conference on Systems Biology of Human Disease (Boston, MA)	2016

TEACHING ACTIVITIES

A. University of Virginia:

Bioreaction Kinetics (BME 4390) Role: Primary Instructor, Responsibility: 100%, Enrollment: 31	Fall 2024 (Aug-Dec)
Research Fundamentals (BME 6311) Role: Co-Instructor, Responsibility: 50%, Enrollment: 25	Spring 2024 (Jan-April)
Bioreaction Kinetics (BME 4550) Role: Primary Instructor, Responsibility: 100%, Enrollment: 35	Fall 2023 (Aug-Dec)
Systems Bioengineering (BME 4315/6315) Role: Co-Instructor, Responsibility: 20%, Enrollment: 34	Spring 2023 (Jan-May)
Bioreaction Kinetics (BME 4550) Role: Primary Instructor, Responsibility: 100%, Enrollment: 57	Fall 2022 (Aug-Dec)
Systems Bioengineering (BME 4315/6315) Role: Co-Instructor, Responsibility: 20%, Enrollment: 28	Spring 2022 (Jan-May)
Bioreaction Kinetics (BME 4550) Role: Primary Instructor, Responsibility: 100%, Enrollment: 15	Fall 2021 (Aug-Dec)
Systems Bioengineering (BME 4550/6315) Role: Co-Instructor, Responsibility: 20%, Enrollment: 23	Spring 2021 (Jan-May)

B. University of Michigan:

Bioreaction Engineering and Design (BIOMEDE 321) Role: Co-Instructor, Responsibility: 50%, Enrollment: 75	Winter 2020 (Jan-Apr)
Bioreaction Engineering and Design (BIOMEDE 321) Role: Primary Instructor, Responsibility: 100%, Enrollment: 54	Winter 2019 (Jan-Apr)
Engineering Approaches to Cancer Biology (BIOMEDE 599) Role: Co-Instructor, Responsibility: 50%, Enrollment: 8	Winter 2018 (Jan-Apr)

SUPERVISING AND MENTORING ACTIVITIES

A. Mentoring Committee for Early-Career Faculty:

1. Sameer S. Bajikar, Ph.D.
Assistant Professor of Cell Biology and Biomedical Engineering
University of Virginia
- 2.

B. Supervised Research Staff:

1. Katharine Biegert (February 2024-Present)
Research Specialist Intermediate and Lab Manager
2. Mohan Manikkam (May 2017-June 2024)
Research Specialist Intermediate and Lab Manager

C. Visiting Faculty:

3. Juan (Sebastian) Yakisich (June 2022-July 2022)
Assistant Professor at Hampton University, Short-Term Research Initiative for Visiting Educators in Cancer (STRIVE-C), UVA Comprehensive Cancer Center

D. Mentored Postdoctoral Trainees:

1. Zeinab Chitforoushzadeh (November 2023-Present)
Project title: Developing, validating, and applying highly multiplexed imaging to measure molecular features at cellular, subcellular, and organelle resolution in tumor cells, tissues, and chromosome spreads.
2. Shahab Azarfar (May 2022-April 2023)
Co-mentored by Heman Shakeri (School of Data Science)
Project title: Dissecting the origins of heterogeneous cancer cellular interactions and responses to therapeutic perturbation
Current position: Research Associate at UVA School of Data Science
3. Mehwish Khaliq (November 2017-July 2022)
Project title: Elucidating the role of global histone modifications and histone-modifying enzymes in therapy-induced phenotype switching of melanoma
Research award: NCI T32 Cancer Biology Training Program (University of Michigan, 2018-2020)
Presentation award(s): 6th Annual Cancer Biology Retreat Best Poster Presentation Award (University of Michigan, 2018)
Current position: Senior Scientist at Dewpoint Therapeutics
4. Doug Bauman, (June 2018-October 2021)
Project title: Interrogating Induced Phenotypic Heterogeneity Through the AP-1 Gene Regulatory Network
Research award: UVA Cancer Center Trainee Fellowship (2020-2021)
Presentation award(s): People's Choice Postdoc180 Presentation Award (University of Michigan, 2019)
Current position: Senior Scientist at Dewpoint Therapeutics

E. Doctoral Theses Directed:

1. Emma Bakall Loewgren (Biomedical Engineering, 2024-Present)
Project title: to be determined

2. Audrey Kidd (Biomedical Engineering, 2023-Present)
Project title: to be determined
Research award(s):
 - NIGMS T32 Systems & Biomolecular Data Sciences Training Program (2024-2025)
 - 2025 UVA Cancer Center Travel Award
3. Kimberly Nguyen (Biochemistry and Molecular Genetics, Medical Scientist Training Program, 2023-Present)
Project title: Understanding the origins of spatial heterogeneity in melanoma cell fate during primary growth and early after metastatic dissemination
Research award(s):
 - NCI T32 Cancer Research Training Program (University of Virginia, 2024-2025)
 - 2025 UVA Cancer Center Travel Award
4. Yonatan Degefu (Biomedical Engineering, 2021-Present)
Project title: The role of AP-1 transcription factor network dynamics in cancer cell plasticity
Research award(s):
 - NIGMS T32 Systems & Biomolecular Data Sciences Training Program (2023-2024)
 - 2023 UVA Cancer Center Travel Award
5. Luisa Quesada (Biomedical Engineering, 2020-Present)
Project title: Identifying new therapeutic strategies in melanoma based on reprogramming of histone modification states
Research award(s): 2023 UVA Cancer Center Travel Award
Presentation award(s): NCI Junior Investigator Meeting Poster Presentation Award (2022)
6. Cara Abecunas (Biomedical Engineering, 2018-2023)
Project title: Experimental and Computational Systems Pharmacology Approaches to Elucidate New Vulnerabilities in NF1^{LoF} Melanoma and Other Cancers
Research award: Rackham Merit Fellowship (University of Michigan, 2019-2023)
Presentation award(s): Cancer Biology Program Best Trainee Presentation and Travel Award (UVA Cancer Center, 2022)
Current position: Senior Scientist at Novartis
7. Natacha Comandante-Lou (Biomedical Engineering, 2017-2022)
Project title: A Systems Approach to Overcome Tumor-cell Heterogeneity in Drug Response: Metrics and Mechanisms.
Research award(s):
 - Rackham International Student Fellowship (University of Michigan, 2018)
 - Richard and Eleanor Towner Prize for Distinguished Academic Achievement Award (University of Michigan, 2022)**Current position:** Postdoctoral Fellow at Columbia University Irving Medical Center

F. Doctoral Thesis Committees Served On:**As Committee Chair:**

1. Hayley Sussman (Biomedical Engineering, 2024-Present), Mentor: Dan Abebayehu
2. Alice Luanpaisanon (Biomedical Engineering, 2024-Present), Mentor: Jeff Saucerman
3. Alekhya Kandoor (Biomedical Engineering, 2022-Present), Mentor: Kristen Naegle
4. Lionel Watkins (Biomedical Engineering, 2022-Present), Mentor: Jeff Saucerman
5. Joseph Ficarrotta (Biomedical Engineering, 2021-Present), Mentor: Jason Papin
6. Tor Breza (Biomedical Engineering, 2021-Present), Mentor: Richard Price
7. Gabrielle Martinez (Biomedical Engineering, 2021-Present), Mentor: Kristen Naegle

As Committee Member:

8. Bingjie Xue (Biomedical Engineering, 2023-Present), Mentor: Nathan Sheffield
9. Nathan LeRoy (Biomedical Engineering, 2023-Present), Mentor: Nathan Sheffield
10. Caroline Riedstra (Micro-, Immuno- and Cancer Biology, 2022-Present), Mentor: Andrew Dudley
11. Andrew Miller (Biomedical Engineering, 2022-2024), Mentor: Tom Barker
12. Rob Barnes (Biomedical Engineering, 2021-Present), Mentor: Sepideh Dolatshahi
13. Grace Bingham (Biomedical Engineering, 2021-2023), Mentor: Tom Barker
14. Sam Crowl (Biomedical Engineering, 2021-Present), Mentor: Kristen Naegle
15. Armita Salahi (Electrical Engineering, 2021-2022), Mentor: Nathan Swami
16. Taylor Marohl (Biomedical Engineering, 2021-Present), Mentor: Kevin Janes
17. Alexys Riddick (Experimental Pathology, 2021-Present), Mentor: Hui Zong
18. Mackenzie Grubb (Biomedical Engineering, 2021-Present), Mentor: Steven Caliar
19. Stephen Carney (Cancer Biology, 2018-2021), Mentor: Maria Castro

G. Master Students Advised:

1. Haolong Huang (Biomedical Engineering, 2019)
Project title: The relationship between NGFR state heterogeneity and ERK pathway reactivation in MAPK inhibitor treated BRAF^{V600E} melanoma cells
Current position: Chemical Engineering PhD Student at University of Michigan

H. Undergraduate Research Students Advised:**University of Virginia BME Program:**

1. You (Henry) Gao (Biomedical Engineering and Computer Science, Spring 2023-Present)
Research award: NIGMS Administrative Supplement for Undergraduate Summer Research Experience (Summer 2023)
2. Jonathan Daniel (Biomedical Engineering, Summer 2020)
Current position: BME Graduate Student at Johns Hopkins University
3. Melody Chiang (Biomedical Engineering, Summer 2020)
Current position: Medical Student at University of Michigan Medical School
4. Isabella Posey (Biomedical Engineering, Summer 2020)
Current position: BME Graduate Student at Cornell University

NSF REU in Multi-Scale Systems Bioengineering and Biomedical Data Sciences:

5. Gina Chea (Bioengineering, George Mason University, Summer 2023)
6. Anna Tang (Applied mathematics, University of Utah, Summer 2022)

UVA School of Medicine Summer Research Internship Program:

7. Loan Quynh Tran (Biology, Virginia Commonwealth University, Summer 2024)
Research award(s):
 - 2024 ABRCMS Travel Award
 - 2024 ABRCMS Outstanding Presentation Award in Cancer Biology
8. Ariana Caraballo Soler (Molecular and Cellular Biology, University of Puerto Rico, Summer 2022)

University of Michigan:

9. Divya Venkat (Biochemistry, 2018-2019)
Current position: Medical Student at Wayne State University School of Medicine

I. Additional Rotation PhD Students Advised:

1. Ify Nwolah (Biomedical Engineering, Fall 2024)

2. Arthur Huang (Medical Scientist Training Program, Summer 2024)
3. Alice Luanpaisanon (Biomedical Engineering, Fall 2022)
4. Jeffrey Hsu (Medical Scientist Training Program, Summer 2022)
5. Caitlin Jagla (Biomedical Sciences Graduate Program, Fall 2021)
6. Stephen Lees (Biomedical Engineering, Fall 2021)
7. Connor Moore (Biomedical Engineering, Fall 2021)
8. Lillian DeCostanza (Biomedical Engineering, Fall 2021)
9. Joseph Ficarrotta (Biomedical Engineering, Fall 2020)
10. Catalina Alvarez Yela (Biomedical Engineering, Fall 2020)
11. Christina Lee (Biomedical Engineering, Fall 2018)
12. Lauren Bailey (Cancer Biology, Fall 2018)

J. Faculty Advocate for BME Graduate Students:

1. Amanda Knizley (Biomedical Engineering, 2023-2024)
2. Ryann Boudreau (Biomedical Engineering, 2021-2022)
3. Rob Barnes (Biomedical Engineering, 2020-2021)

ACADEMIC SERVICE AND LEADERSHIP POSITIONS

A. University of Virginia:

1) UVA Department of Biomedical Engineering (BME)

Chair, BME Seminar Committee	2022 - Present
Member, BME Graduate Program Committee	2021 - Present
Member, BME Graduate Admissions Committee	2020 – 2021

2) UVA School of Medicine

Executive Committee Member, T32 Cancer Research Training Program (CRTP)	2022 - Present
Director of Assessment and Follow-up, T32 Cancer Research Training Program (CRTP)	2022 - Present
Member, T32 MSTP Faculty Admissions and Advisory Committee (MFAAC)	2023 - Present
Member, American Cancer Society Institutional Grant (ACS-IRG) Committee	2023 - Present

3) UVA School of Engineering and Applied Science

Member, Engineering Research Advisory Council (ERAC)	2023 - Present
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4) UVA Comprehensive Cancer Center

Basic Science Lead, Melanoma Translational Research Team	2020 - Present
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5) Other University-Level Leadership Positions

Member, Drug Discovery Faculty Search Committee, Department of Chemistry and UVA Comprehensive Cancer Center	2024 - Present
Scientific Advisory Board Member, integrated Translational Health Research Institute of Virginia (iTHRIV)	2023 - Present

B. University of Michigan:

1) University of Michigan Department of Biomedical Engineering (BME)

Member, BME Team for Diversity, Equity, & Inclusion in STEM departments	2019
Member, BME Graduate Admissions Committee	2017 - 2020
Member, BME Summer Undergraduate Research in Engineering (SURE) Committee	2018 - 2020

2) University of Michigan Medical School

Member, Medical School Basic Science Research IT Committee	2019 - 2020
Member, Admissions Committee, T32 Cancer Biology Doctoral Program	2018 - 2020
Member, Michigan Postdoctoral Pioneer Program (MP3) Review Committee	2019 - 2020