

CURRICULUM VITAE  
University of Pittsburgh  
School of Medicine  
**BIOGRAPHICAL**

**Name:** David Gau, PhD  
**E-Mail Address:** dave.gau@pitt.edu  
**Website:** [My Bibliography](#)

**Business Address:** 3550 Terrace Street  
S707b Scaife Hall  
Pittsburgh PA, 15261  
**Business Phone:** 610-883-0348

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**EDUCATION and TRAINING**

**UNDERGRADUATE:**

August 2006 – May 2011	University of Pittsburgh	B.Phil.	Bioengineering
	University of Pittsburgh	B.S.	Mathematics

**POST-UNDERGRADUATE:**

June 2011 – July 2012	University of New England, Australia		Biophysics
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**GRADUATE:**

August 2012 – May, 2018	University of Pittsburgh	Ph.D.	Bioengineering
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**APPOINTMENTS and POSITIONS**

**ACADEMIC:**

June 2018 – August 2022	University of Pittsburgh School of Engineering	Post-Doctoral Associate
Sept 2022 – July 2024	University of Pittsburgh School of Engineering	Lecturer
August 2024 – Current	University of Pittsburgh School of Medicine	Assistant Professor

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**CERTIFICATION and LICENSURE**

**Pitt-CIRTL Associate Certification in STEM Teaching**, University of Pittsburgh, 2016  
**Micro-credential Leading People in Organizations**, Katz Graduate School of Business, 2021

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**MEMBERSHIP in PROFESSIONAL and SCIENTIFIC SOCIETIES**

American Society for Cell Biology	2008 – Present
Biomedical Engineering Society	2008 – Present
American Association for Cancer Research	2009 – Present
North American Vascular Biology Organization	2019 – Present

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**HONORS**

Mathematical Contest in Modeling, Meritorious Winner	2009
Alma Newlin Education Fund and Golden Panther Award, University of Pittsburgh	2010
Senior of the Year and Valedictorian Speaker at University of Pittsburgh	2011
Rotary Ambassadorial Scholarship	2011
Whitaker Fellowship	2011
NSF GRFP Fellowship	2012
Alumni Recruitment Volunteer of the Year, University of Pittsburgh	2014
Cardiovascular Bioengineering Training Program Trainee	2015
Provost Development Fund Doctoral Trainee	2017
Skin Biology and Cancer Training Program Trainee	2018
UPSIDE Award, PITT STRIVE	2019
National Cancer Center Postdoctoral Fellowship	2020
Cardiovascular Training Program Trainee	2020
NIH Pathway to Independence (K99/R00)	2022

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**PUBLICATIONS**

**1. ORIGINAL PEER REVIEWED ARTICLES**

1) Ding Z., **Gau D.**, Deasy B, Wells A., Roy P. (2009): Both actin and polyproline interactions of profilin-1 are required for vascular endothelial cell migration, invasion and capillary morphogenesis. **Exp Cell Res** 315 (17): 2963-2973. PMID: PMC2757537.

- 2) **Gau D.**, Ding Z., Baty C., Roy P. (2011): Fluorescence resonance energy transfer based interaction between VASP and profilin. **Cellular and Molecular Bioengineering** 4(1):1-8. PMID: 21566724.
- 3) Coumans J., **Gau D.**, Poljak A., Wasinger V., Roy P., Moens P. (2014) Green fluorescent protein expression triggers proteome changes in breast cancer cells. **Exp Cell Res.** Jan 1; 320(1):33-45 PMID: 2899627.
- 4) Salvemini I., **Gau D.**, Reid J., Bagatolli L., Macmillan A., Moens P. (2014) Low PIP(2) molar fractions induce nanometer size clustering in giant unilamellar vesicles. **Chemistry and Physics of Lipids.** Jan 177:51-63 PMID: 24269375
- 5) Coumans J., **Gau D.**, Poljak A., Wasinger V., Roy P., Moens P. (2014) Profilin-1 overexpression in MDA-MB-231 breast cancer cells is associated with alteration in proteomic markers of cell proliferation, survival and motility as revealed by global proteomics analyses. **OMICS- A Journal of Integrative Biology.** Dec 18(12):778-91 PMID: 25454514
- 6) **Gau D.\***, Lesnock J.\*, Hood B., Bhargava R., Sun M., Darcy K., Conrads T., Edwards R., Kelley J., Krivak T., Roy P. (2015) BRCA1 deficiency in ovarian cancer is associated with alteration in expression of several key regulators of cell motility – A proteomics study. **Cell Cycle** 14(12):1884-92. PMID: 25927284. \* **co-first author**
- 7) **Gau D.\***, Veon W.\*, Zeng X., Yates N., Shroff S., Koes D., Roy P. (2016) Threonine 89 is an important residue of profilin-1 that is phosphorylatable by protein-kinase A, **PLOS one** May 26;11(5):e0156313. doi: 10.1371/journal.pone.0156313. PMID: 27228149 PMCID: PMC4882052. \* **co-first author**
- 8) Joy M., **Gau D.**, Castellucci N., Prywes R., Roy P. (2017) The Myocardin-related transcription factor MKL co-regulates the levels of two profilin isoforms **J. Biol Chem** 292(28):11777-11791. PMID: 28546428 PMCID: PMC 5512072
- 9) **Gau D.**, Veon W., Capasso T, Bottcher R., Shroff S., Roman B., Roy P. (2017) Pharmacological intervention of MKL/SRF signaling by CCG-1423 impedes endothelial cell migration and angiogenesis; **Angiogenesis** 20(4):663-672. PMID: 28638990
- 10) **Gau D.**, Lewis T., McDermott L., Wipf P., Koes D., Roy P. (2018) Structure-based virtual screening identifies a small molecule inhibitor of the profilin1-actin interaction. **J. Biol Chem** Feb 16; 293(7):2606-2616. PMID: 29282288 PubMed Central PMCID: PMC5818201.
- 11) **Gau D.**, Roy P. (2018) SRF'ing and SAP'ing: the role of MRTF proteins in cell migration. **J. Cell Science** Oct 11;131(19). PMID: 30309957 PMCID: PMC6919568
- 12) Chakraborty S., Jiang C., **Gau D.**, Oddo M., Ding Z., Vollmer L., Joy M., Schiemann W., Stolz D., Vogt A., Ghosh S., Roy P. (2018) Profilin-1 deficiency leads to SMAD3 upregulation and impaired 3D outgrowth of breast cancer cells. **British J. Cancer** 119(9):1106-1117. PMID: 30318519 PMCID: PMC 6219497
- 13) Goldschmidt E., Schneck M., **Gau D.**, Carey L., Ramsussen J., Ferreyro B., Ajler P., Snyderman C., Wang E., Fernandez-Miranda J., Gardner P. (2019) Effect of oxidized cellulose on human respiratory mucosa and submucosa and its implications for endoscopic skull-base approaches. **Int Forum Allergy Rhinol** Mar; 10(3):282-288 PMID 31856397
- 14) **Gau D.**, Veon J., Shroff S., Roy P. (2019) The VASP:Profilin-1 interaction is critical for efficient cell migration and regulated by cell-substrate adhesion in a PKA-dependent manner. **J. Biol Chem** Apr 26; 294(17):6972-6985 PMID:30814249. PMCID: PMC6497960
- 15) **Gau D.**, Roy P. (2020) Single cell migration assay using human breast cancer MDA-MB-231 cell line. **Bio-protocols** 10(8) April. DOI: 10.21769/BioProtoc.3586 PMID: 32656296
- 16) **Gau D.**, Roy P. (2020) An in vitro assay to screen for substrates for PKA using phospho-motif-specific antibodies. **Bio-protocols** 10(8) April. DOI: 10.21769/BioProtoc.3587 PMID: 32601599
- 17) **Gau D.**, Vignaud L., Allen A., Sahel J., Boone D., Koes D., Guillonneau X., Roy P. (2020) Disruption of profilin1 function suppresses developmental and pathological retinal neovascularization. **J. Biol. Chem** 295(28):9618-9629 PMID: 32444495
- 18) Allen A. \*, **Gau D.\***, Francoeur P., Sturm J., Wang Y., Martin R., Maranchie J. Duensing A., Kaczorowski A., Duensing S., Wu L., Lotze M.T., Koes D., Storkus W., Roy P (2020) Actin-binding protein profilin1 promotes aggressiveness of clear cell renal cell carcinoma cells. **J. Biol. Chem** Nov 13; 295(46):15636-15649. doi: 10.1074/jbc.RA120.013963. PMID: 32883810. \* **co-first author**
- 19) Allen A. \*, **Gau D.\***, Roy P. (2021) Role of Profilin1 in cardiovascular disease **J. Cell Science** 134(9):jcs249060. PMID: 33961053. \* **co-first author**
- 20) **Gau D.**, Vignaud L., Francoeur P., Koes D., Guillonneau X., Roy P. (2021). Inhibition of ocular neovascularization by novel anti-angiogenic compound. **Exp Eye Res** 213:108861 doi: 10.1016/j.exer.2021.108861 PMID: 34822853, PMCID: PMC8845053
- 21) Yadav T., **Gau D.**, Roy P. (2022) Mitochondria-actin cytoskeleton crosstalk in cell migration. **J. Cell Physiology** 237(5): 2387-2403 PMID: 35342955
- 22) **Gau D.**, Chawla P., Roy P. (2022) Myocardin-related transcription factor's interaction with serum-response factor is critical for outgrowth initiation, progression and metastatic colonization of breast cancer cells. **FASEB BioAdvances** 4(8):509-523. PMID: 35949508 PMCID: PMC9353439
- 23) Clark R., Besterfield-Sacre M., Dickerson S., **Gau D.** (2023) Impact of COVID-19 on engineering students in the middle phases of the pandemic: academic motivation, valued college experiences, and stress. **International Journal of Engineering Education** 39(1): 30-47.

- 24) **Gau D.\***, Allen A., Daoud A., Kunkel J., Lee S., Sagan A., Boone D., Osmanbeyoglu H., Roy P. (2023) Vascular endothelial profilin-1 Inhibition suppresses tumor progression in renal cancer. *J. Biol. Chem* 299(8):105044. PMID: 37451478. \* **corresponding author**
- 25) Allen A., **Gau D.**, Varghese C., Boone D., Stolz D., Larregina A., Roy P. (2023) Vascular endothelial cell-specific disruption of the profilin1 gene leads to severe multiorgan pathology and inflammation causing mortality. *PNAS Nexus* 2(10):pgad305. PMID: 37781098.
- 26) Ricci M., Orenberg A., **Gau D.**, Ohayon L., Bae Y., Hammond G., Roy P. (2024) Profilin1 inhibits PI(3,4)P2 synthesis in cells through lipid phosphatase regulation. *J. Biol. Chem* doi:10.1016/j.jbc.2023.105583. PMID: 38141770.
- 27) Allen-Gondringer A., **Gau D.**, Dutta P., Roy P. (2024) Haplo-insufficiency of Profilin1 in vascular endothelial cells is beneficial but not sufficient to confer protection against experimentally induced atherosclerosis. *Cytoskeleton*. doi: 10.1002/cm.21859. PMID: 38623956
- 28) Eder I., Yu V., Antonello J., Chen F., **Gau D.**, Chawla P., Joy M., Lucas P., Boone D., Lee A., Roy P. (2024) mDia2 is an important mediator of MRTF-A-dependent regulation of breast cancer cell migration. *Mol Biol Cell*. Doi: 10.1091/mbc.E24-01-0008. PMID: 39196658

## **2. OTHER PEER-REVIEWED PUBLICATIONS**

- 1) Wosu S., Abramowitch S., **Gau D.** (2019) Early lessons in changing engineering culture for the success of URM doctoral students in engineering: PITT STRIVE. *IEEE ISEC*.
- 2) **Gau D.**, Sinex D., Besterfield-Sacre M., Abramowitch S., Wosu S. (2020) Implementation of a future faculty development program: impact and evaluation of years 1 & 2. *Annual meeting of ASEE*.
- 3) Sylvanus W., Abramowitch S., **Gau D.**, Clark R. (2022) Integrative framework for global preparedness and cultural competency of engineering careers. *International Conference on Global Studies IC-GS*.
- 4) Sylvanus W., Abramowitch S., **Gau D.**, Besterfield-Sacre M. (2023) PITT STRIVE Program Implementation Model. *CoNECD*.

## **3. ABSTRACTS (not in Scientific Journals)**

- 1) Ding Z., **Gau D.**, Deasy B., Chirieleison S., Roy P. (2008) Ligand interactions of profilin-1 in migration and capillary morphogenesis of vascular endothelial cells. *Annual meeting of the American Association of Cell Biology*.
- 2) **Gau D.**, Ding Z., Deasy B., Wells A., Roy P. (2009): Both actin and polyproline interactions of profilin-1 are required for vascular endothelial cell migration, invasion and capillary morphogenesis *Annual Biomedical Engineering Society Meeting. (podium presentation)*
- 3) **Gau D.**, Ding Z., Baty C., Roy P. (2010): VASP-profilin1 interaction in breast cancer cell migration. *Annual meeting of the American Society of Cell Biology*.
- 4) **Gau D.**, Salvemini I., Reid J., Moens P. (2011): BODIPY phosphatidylinositol probes incorporation into the membrane of giant unilamellar vesicles grown in carbohydrate and physiological buffer solutions. *Annual ASB & RACI Joint Conference. (podium presentation)*
- 5) Lesnock J., **Gau D.**, Conrads T., Kelley J., Krivak T., Edwards R., Roy P. (2014) The functional significance of profilin-1 in BRCA1-deficient breast cancer cells. *Annual meeting of the Society of Gynecological Oncology*.
- 6) **Gau D.**, Lesnock J., Krivak T., Edwards R., Roy P. (2014) BRCA1 impacts ovarian cancer cell migration through regulating profilin-1 expression. *Annual meeting of the American Association of Cancer Research*.
- 7) **Gau D.**, Veon W., Koes D., Yates N., Shroff S., Roy P. (2014) Threonine 89 phosphorylation is a novel post-translational modification that has severe consequences on profilin-1 *Annual meeting of the American Society of Cell Biology*.
- 8) Jiang C., Ding Z., Joy M., Vollmer L., **Gau D.**, Kim SH., Singh S., Vogt A., Roy P. (2015) Profilin-1 is a key determinant for tumorigenic potential of breast cancer cells. *Annual meeting of the American Association of Cancer Research*.
- 9) **Gau D.**, Veon W., Guo Z., Roy P. (2015) Hyperactivation of protein-kinase A inhibits endothelial cell migration and angiogenesis through phosphorylating and inhibiting actin-binding protein profilin-1 *Annual meeting of the American Society of Cell Biology*
- 10) Joy M., **Gau D.**, Castellucci N., Prywes R., Roy P. (2016) Myocardin-related transcription factor MKL co-regulates the expression of profilin isoforms in an SRF-independent manner *Annual meeting of the American Society of Cell Biology*.
- 11) **Gau D.**, Veon W., Capasso T, Roman B., Koes D., Roy P. (2016) Small molecule-mediated inhibitions of transcriptional cofactor MKL and its downstream target profilin impedes endothelial cell migration and angiogenesis *Annual meeting of the American Society of Cell Biology*
- 12) Sunseri J., Koes D., **Gau D.**, Roy P. (2017) Characterization of profilin binding kinetics using Ensemble molecular dynamics simulations. *Annual meeting of the American Biophysical Society*
- 13) **Gau D.**, Veon W, Capasso T., Joy M., Roman B, Koes D., Roy P. (2017). Small molecule-mediated inhibitions of transcriptional cofactor MKL and its downstream target profilin impedes endothelial cell migration and angiogenesis. *Northeast Bioengineering Conference (podium presentation)*
- 14) Sturm J., **Gau D.**, Francoeur P., Koes D., Roy P. (2018). In Silico Screen For Novel Anti-angiogenic Agents Via Inhibition Of Actin:Profilin1 Interaction. *Annual meeting of the Biomedical Engineering Society*.

- 15) Dadey A., **Gau D.**, Roy P. (2018). Pharmacological Inhibition of Myocardin-Related Transcription Factor as a Novel Strategy to Inhibit Growth and Migration of Triple-Negative Breast Cancer Cells. *Annual meeting of the Biomedical Engineering Society*.
- 16) Goldschmidt E., **Gau D.**, Schneck M., Roy P., Gardner P. (2018) Cerebrospinal fluid (CSF) can inhibit wound healing and induce CSF leaks by inhibiting angiogenesis. **Neurosurgery** 65(1):121. (**podium presentation – best paper**)
- 17) Goldschmidt E., **Gau D.**, Dadey A, Li Z, Schneck M., Wang E, Roy P., Wenzel S, Gardner P. (2019) Insulin promotes cellular growth in an in vitro model of mucosal healing after endoscopic endonasal approaches. **J. Neurol Surgery B. Skull Base** 20(1):121 (**podium presentation**)
- 18) Guillonneau X., **Gau D.**, Vignaud L., Sturm J., Francoeur P., Koes D., Roy P. (2019) First generation small molecule antagonists of profilin1 suppresses pathological retinal neovascularization. *Annual meeting of Research in Vision and Ophthalmology* (**podium presentation**).
- 19) Wang Y., Appleman L., Zhai S., **Gau D.**, Roy P., and Lotze M. (2019) A New Damage Associated Molecular Pattern Molecule Increase in Serum Profilin 1 (Pfn1) in Renal Cancer Patients Treated with High Dose Interleukin 2 (IL-2) and Hydroxychloroquine (HCQ): *Annual meeting of the Translational Research Cancer Center Symposium*.
- 20) **Gau D.**, Ohayon L., Bae L. Roy P. (2019) Breast cancer cell invasiveness is stimulated by loss of membrane interaction of actin-binding protein profilin1 via altered phosphoinositide metabolism *Annual Experimental Biology meeting*.
- 21) **Gau D.**, Chakraborty S., Boone D., Roy P. (2019) MRTF-profilin is an important signaling axis for metastatic outgrowth of triple-negative breast cancer cell. *Annual meeting of the American Association of Cancer Research*.
- 22) **Gau D.**, Wosu S., Abramowitch S. (2019) Adopting an evidence-based strategy to improve success of URM doctoral students in engineering: PITT STRIVE Program. *NSF-AGEP Annual Research Meeting*
- 23) Allen A., Martin R., **Gau D.**, Wang Y., Duensing A., Duensing S., Lotze M., Storkus W., Roy P. (2019) Actin-Binding Protein Profilin1 Is a Novel Biomarker and a Target for Intervention in Clear Cell Renal Cell Carcinoma. *Annual meeting of the Biomedical Engineering Society*
- 24) **Gau D.**, Chakraborty S., Boone D., Roy P. (2019) Pharmacological Inhibition of MRTF Induces Dormancy-Like Response in Metastatic Triple-Negative Breast Cancer Cells *Annual meeting of the Biomedical Engineering Society* (**podium talk**)
- 25) **Gau D.**, Vignaud L., Allen A., Boone D., Koes D., Guillonneau X., Roy P. (2019) Profilin1 is an important regulator of developmental and pathological retinal neovascularization *Annual meeting of the American Society of Cell Biology*
- 26) Allen A., **Gau D.**, Wang Y., Martin R., Maranchie J. Duensing A., Sims-Lucas S., Kaczorowski A., Duensing S., Wu L., Lotze M.T., Storkus W., Roy P. (2019) Profilin1 is an important intracellular and extracellular mediator of endothelial-tumor cell crosstalk in tumor cell motility and a novel prognostic biomarker in clear cell renal cell carcinoma *Annual meeting of the American Society of Cell Biology*
- 27) Allen A., **Gau D.**, Francoeur P., Wang Y., Martin R., Maranchie J. Duensing A., Kaczorowski A., Duensing S., Wu L., Lotze M.T., Koes D., Storkus W., Roy P. (2020) Transcriptome-guided identification of novel interventional target in clear cell renal cell carcinoma. *Annual meeting of the Biomedical Engineering Society*
- 28) **Gau D.**, Chawla P, Joy M, Boone D, Lucas P, Roy P. (2021) MRTF-SRF interaction is essential for metastatic colonization *Annual meeting of the American Society of Cell Biology/European Molecular Biology Organization* (**mini-symposium talk**)
- 29) **Gau D.**, Allen A., Daoud A., Kunkel J., Villanueva F., Roy P. (2022). Vascular endothelial profilin-1 inhibition suppresses tumor progression in renal cancer. *Kidney Cancer Research Summit*.
- 30) Castle J., Ferrera J., **Gau D.**, Glexinar A., Roy P., Kolarcik C (2022) The impact of profilin-1 mutations on protein homeostasis in amyotrophic lateral sclerosis. *Experimental Biology* (**podium talk**)
- 31) **Gau D.**, Sun Q., Chawla P., Eder I., Joy P., Lucas P., Galson D., Roy P. (2022). Tumor-Intrinsic and -Extrinsic Mechanisms of MRTF-Dependent Regulation of Bone Colonization by Breast Cancer Cells, *Annual meeting of the Association of Bone and Mineral Research*.
- 32) **Gau D.**, Allen A., Daoud A., Kunkel J., Paranjape A., Villanueva F., Roy P. (2022). Vascular endothelial profilin-1 inhibition suppresses tumor progression in renal cancer. *Annual meeting of the American Society of Cell Biology/European Molecular Biology Organization* (**micro-symposium talk**)
- 33) **Gau D.**, Allen A., Daoud A., Kunkel J., Duensing S., Roy P. Genetic disruption of vascular endothelial profilin-1 impacts tumor microenvironment suppressing tumorigenicity in renal cancer (2023). *Annual meeting of the American Association of Cancer Research*.
- 34) **Gau D.**, Daoud A., Allen A., Joy M., Sagan A., Lee S., Lucas P., Duensing S., Boone D., Osmanbeyoglu H., Storkus W., Roy P. (2023). Vascular endothelial profilin-1 drives a pro-tumorigenic tumor microenvironment and tumor progression in renal cancer. *Kidney Cancer Research Symposium*
- 35) **Gau D.**, Allen A., Daoud A., Kunkel J., Lee S., Sagan A., Boone D., Osmanbeyoglu H., Roy P. (2023). Profilin-a is a novel regulator of immunosuppression and a target for immunotherapy in renal cancer. *Annual meeting of the American Society of Cell Biology/European Molecular Biology Organization* (**subgroup podium talk**)
- 36) **Gau D.**, Allen A., Paranjape A., Villanueva F., Storkus W., Roy P. (2024). Targeting vascular endothelial Pfn1 using small molecule compound and DC vaccine as therapy for ccRCC. *Kidney Cancer Research Symposium*

## PROFESSIONAL ACTIVITIES

### TEACHING:

**Molecular Cell Biology and Biophysics** (BIOE2520) – Graduate Level (University of Pittsburgh) – 3 lectures 9 hrs (2018)

**Molecular Cell Biology and Biophysics** (BIOE2520) – Graduate Level (University of Pittsburgh) – 3 lectures 9 hrs (2019)

**Molecular Cell Biology and Biophysics** (BIOE2520) – Graduate Level (University of Pittsburgh) – 3 lectures 9 hrs (2020)

**Molecular Cell Biology and Biophysics** (BIOE2520) – Graduate Level (University of Pittsburgh) – 3 lectures 9 hrs (2021)

**Molecular Cell Biology and Biophysics** (BIOE2520) – Graduate Level (University of Pittsburgh) – 3 lectures 9 hrs (2022)

**Molecular Cell Biology and Biophysics** (BIOE2520) – Graduate Level (University of Pittsburgh) – 3 lectures 9 hrs (2023)

**Molecular Cell Biology and Biophysics** (BIOE2520) – Graduate Level (University of Pittsburgh) – 3 lectures 9 hrs (2024)

**Introduction To Grant Writing** (CLRES 2076) – Graduate/Post-Graduate Level (University of Pittsburgh) – 1.5 credits, co-instructor (2022)

**Introduction To Grant Writing** (CLRES 2076) – Graduate/Post-Graduate Level (University of Pittsburgh) – 1.5 credits, co-instructor (2023)

**Introduction To Grant Writing** (CLRES 2076) – Graduate/Post-Graduate Level (University of Pittsburgh) – 1.5 credits, co-instructor (2024)

**Introductory Cell Biology 2** (BIOE1072) – Undergraduate (University of Pittsburgh) – 1 lecture 1 hour (2018)

**Introductory Cell Biology 2** (BIOE1072) – Undergraduate (University of Pittsburgh) – 1 lecture 1 hour (2019)

**Introductory Cell Biology 2** (BIOE1072) – Undergraduate (University of Pittsburgh) – 1 lecture 1 hour (2020)

**Introductory Cell Biology 2** (BIOE1072) – Undergraduate (University of Pittsburgh) – 1 lecture 1 hour (2021)

**Introductory Cell Biology 2** (BIOE1072) – Undergraduate (University of Pittsburgh) – 1 lecture 1 hour (2022)

**Introductory Cell Biology 2** (BIOE1072) – Undergraduate (University of Pittsburgh) – 1 lecture 1 hour (2023)

**Introductory Cell Biology 2** (BIOE1072) – Undergraduate (University of Pittsburgh) – 1 lecture 1 hour (2024)

**Intro to Cell and Molecular Biology Lab Techniques** (BIOE1075) – Undergraduate (University of Pittsburgh) – lead instructor, 3 credits (2020)

**Intro to Cell and Molecular Biology Lab Techniques** (BIOE1075) – Undergraduate (University of Pittsburgh) – lead instructor, 3 credits (2021)

**Intro to Cell and Molecular Biology Lab Techniques** (BIOE1075) – Undergraduate (University of Pittsburgh) – lead instructor, 3 credits (2022)

**Intro to Cell and Molecular Biology Lab Techniques** (BIOE1075) – Undergraduate (University of Pittsburgh) – lead instructor, 3 credits (2023)

**Intro to Cell and Molecular Biology Lab Techniques** (BIOE1075) – Undergraduate (University of Pittsburgh) – lead instructor, 3 credits (2024)

**BioMethods** (BIOE1150) – Undergraduate (University of Pittsburgh) – 6 lectures 14 hrs (2018)

**BioMethods** (BIOE1150) – Undergraduate (University of Pittsburgh) – 6 lectures 14 hrs (2019)

**BioMethods** (BIOE1150) – Undergraduate (University of Pittsburgh) – 6 lectures 14 hrs (2020)

**BioMethods** (BIOE1150) – Undergraduate (University of Pittsburgh) – 6 lectures 14 hrs (2021)

**BioMethods** (BIOE1150) – Undergraduate (University of Pittsburgh) – 6 lectures 14 hrs (2022)

**BioMethods** (BIOE1150) – Undergraduate (University of Pittsburgh) – 6 lectures 14 hrs (2023)

**BioMethods** (BIOE1150) – Undergraduate (University of Pittsburgh) – 6 lectures 14 hrs (2024)

### Mentoring:

1. Marlee Hartenstein (Bioengineering, University of Pittsburgh) (2013-2014)
2. Lauren Fox (Bioengineering, University of Pittsburgh) (2015-2016)
3. Rahul Sane (Bioengineering, University of Pittsburgh) (2015-2016)
4. Praneeth Vendatta (Bioengineering, University of Pittsburgh) (2015-2016)
5. Christian DeMoya (Bioengineering, University of Pittsburgh) (2017-2017)
6. Aiden Dadey (Bioengineering, University of Pittsburgh) (2018-2018)
7. Jordan Sturm (Bioengineering, University of Pittsburgh) (2018-2018), publication
8. Lee Ohayon (Braude College of Engineering, Israel [exchange student]) (2018-2019)
9. Megan Schnek (Emergency Medicine, University of Pittsburgh) (2018-2018), publication
10. Ved Parashar (Biochemistry, Chatham University) (2019-2022)
11. Vatsal Patel (Bioengineering, University of Pittsburgh) (2019-2020)
12. Connor Gill (Bioengineering, University of Pittsburgh) (2019-2020)
13. Hannah Geisler (Bioengineering, University of Pittsburgh) (2019-2020)

14. Kestrel Merritt (Bioengineering, University of Pittsburgh) (2020-2021)
15. Aya Alkhafaji (Bioengineering, University of Pittsburgh, 2021-2021)
16. Tarun Yadav (Indian Institute of Science Education and Research, Pune, 2020 - 2022), publication
17. Katherine Ference (Neurobiology, Haverford College, 2021-2022)
18. Pooja Chawla (Bioengineering, University of Pittsburgh) (2021-2022), publication
19. Jessica Kunkel (Bioengineering, University of Pittsburgh) (2021-2021), publication
20. Rohan Puri (Biology, University of Michigan, 2022-2022)
21. Andrew Daoud (Bioengineering, University of Pittsburgh, 2022-2023), publication
22. Chris Varghese (Biology, University of Pittsburgh, 2022-2023), publication
23. Navya Arora (Shadyside Academy, 2024-2024)
24. Dylan Shields (Bioengineering, University of Pittsburgh, 2024-present)
25. Emma Madoff (Biology, University of Pittsburgh, 2024-present)

**RESEARCH:**

**Current Grant Support:**

Grant Number	Grant Title	Role in Project	Years	Amount
1K99CA267180	Profilin as a Novel Target for Vascular Normalization in Renal Cancer	Primary Investigator	2022-2027	\$1,002,094

**Prior Grant Support:**

Institute	Grant Number	Grant Title	Role in Project
NHLBI	T32HL129964	Training Program in Imaging Sciences in Translational Cardiovascular Research	Post-doctoral trainee
NCC		Profilin in Renal Cell Carcinoma	Post-doctoral trainee
NCI	T32CA175294	Training Program in Skin Biology and Cancer	Post-doctoral trainee
NHLBI	T32HL076124	Cardiovascular Bioengineering Training Program	Pre-doctoral trainee
NSF	1000139050	Profilin-1: A novel regulator of phosphoinositide-directed cellular events	Pre-doctoral trainee

**LIST of CURRENT RESEARCH INTERESTS:**

1. Profilin-1 as a therapeutic target for vascular normalization in kidney cancer.
2. Role of actin binding proteins in mitochondria regulation.
3. Developing a high-throughput microfluidic system for testing therapies on kidney cancer or kidney disease.

**Research Interests:**

I am interested in cellular engineering and overall research interest in cell migration, cancer biology, cell bioenergetics, and angiogenesis. I obtained my PhD in 2018 studying the role of regulating Profilin-1 in neovascularization and am currently a lecturer in bioengineering at the University of Pittsburgh. My research program during the R00 phase is to evaluate the regulation of fundamental cellular processes as a strategy to treat clear cell renal cell carcinoma, a highly vascularized cancer. My vision is to develop novel treatment strategies utilizing in vitro and in vivo models, systems biology, and theranostic tools. My training with Dr. Partha Roy in the Department of Bioengineering at the University of Pittsburgh has provided me with expertise in cancer and vascular biology, animal models, drug screening, and localized drug delivery and diagnosis. These skills uniquely position me to pursue research in this area. Through a systems approach, my group will explore the interaction of renal cell carcinoma and endothelial cells which promote tumor growth and metastasis. My PhD and postdoctoral work thus far have uncovered a novel extracellular role for Profilin-1, a ubiquitously expressed actin binding protein which also plays a key role in regulation of angiogenesis and tumorigenesis. Ultimately, the goal is to develop novel therapies targeting Profilin to treat clear cell renal cell carcinoma and extend this therapy to other diseases caused by excessive angiogenesis. The foundation for my research stems from work funded by the National Cancer Center Postdoctoral Fellowship where I first demonstrated the impact of Profilin on renal cell carcinoma progression. This work also led to preliminary evidence that genetic and small molecule inhibition (small molecule inhibitors of Profilin were developed as part of my PhD training) of Profilin can inhibit renal cell carcinoma growth and metastasis. These results led to my current study on targeting Profilin as a putative therapy for renal cell carcinoma, which is currently funded by a NIH K99/R00 grant. As part of my future studies, I plan to develop an organ-on-a-chip microfluidic device to screen novel therapies for renal cell carcinoma in conjunction with current therapies. I also will develop novel human and mouse kidney cancer cell lines with various genetic knockout combinations using Cas9-mediated CRISPR to investigate different genetic landscapes of renal cell carcinoma. I also strive to be an excellent instructor and mentor. My prior and on-going teaching effort in the Department of Bioengineering has continually provided me the opportunity to further develop myself as an educator for the next generation of cancer researchers.

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**INVITED SEMINARS AND LECTURESHIPS:**

1. BioE REU Symposium, University of Pittsburgh (Aug 2009): Profilin-1 and polyproline protein interactions.
2. PTEI Symposium, Pittsburgh Tissue Engineering Initiative (Aug 2010): VASP-Pfn1 interaction negatively regulates breast cancer cell migration.
3. Rotary International District Conference, Australia (Apr 2012): VASP-Pfn1 interaction negatively regulates breast cancer migration.
4. AFIRM Workshop (Feb 2013): Fluorescence energy resonance transfer (FRET)-based detection of Profilin1-VASP interaction.
5. NEBEC Meeting & GLBC Symposium (Apr 2017, Sept 2016): Small molecule-mediated inhibitions of transcriptional cofactor MKL and its downstream target profilin impedes endothelial cell migration and angiogenesis.
6. UPCI Retreat (June 2017): Structure-based virtual screening to identify first-generation inhibitor of profilin:actin interaction with anti-angiogenic property.
7. NSF-AGEP Annual Research Meeting (May 2019): Adopting an evidence-based strategy to improve success of URM doctoral students in engineering: PITT STRIVE Program.
8. Cancer Biology Program/Women's Cancer Research Center Seminar (Sept 2021): Targeting MRTF to block metastatic colonization of breast cancer.
9. Case Comprehensive Cancer Center Seminar (July 2023): Endothelial Profilin-1 as a Novel Target in Kidney Cancer.
10. University of Arizona Department of Cellular and Molecular Medicine Seminar (February 2024): Endothelial Profilin-1 as a Novel Target in Kidney Cancer.
11. NCI Rising Scholars (July 2024): Vascular endothelial profilin-1 Inhibition suppresses tumor progression in renal cancer. [Presentation Recording.](#)

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**SERVICE:**

University Senate Bylaws Committee, member (2010)  
University Senate Council, member (2010-2014, 2019-2022)  
University Senate Student Affairs Committee, member (2012-2022)  
University Search Chancellor Search Committee, member (2013)  
University Council on Graduate Studies, member (2013-2014)  
Graduate and Professional Student Government, president (2013-2015)  
Pitt Trailblazers, founder (2013-2018)  
University Senate Budget and Planning Committee, member (2013)  
Science fair judge for Pittsburgh Regional Science & Engineering Fair (2013 – present)  
AAU/AAAS CASE Advocacy delegation member (2014)  
PITT CampBioE, collaborator (2014-2018)  
University Research Council, member (2015-2018)  
University Equity, Inclusion and Anti-Discrimination Advocacy Committee, member (2015-2018)  
Module coordinator for STEM exploration day at Penn State (2016)  
University of Pittsburgh Postdoctoral Association, president (2018-2022)  
University of Pittsburgh Year of Data and Society Awards Committee, member (2020-2021)  
Bioengineering DE&I Committee, member (2020-present)  
Ad-hoc committee on dependent care, member (2021-2023)  
Hillman Summer Academy, Women's Cancer Research Center, co-site director (2023-present)