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EDUCATION AND RESEARCH APPOINTMENTS

Director of Graduate Studies	Biomedical Engineering Program Brown University	2024-
Associate Director of Cancer Education and Training Coordination	Legorreta Cancer Center Brown University	2024-
Associate Professor of Medical Science	Brown University Department of Molecular Biology, Cell Biology, and Biochemistry (MCB)	2024-
Assistant Professor of Medical Science	Brown University Department of Molecular Biology, Cell Biology, and Biochemistry (MCB)	2016 - 2024
Assistant Professor of Chemical and Biomolecular Engineering	Georgia Institute of Technology (GT) School of Chemical & Biomolecular Engineering	2008-2016
Postdoctoral Research Fellow	Harvard Medical School Massachusetts General Hospital; Edwin L. Steele Lab; Advisor: Rakesh K. Jain	2005-2008
Ph.D. in Chemical and Biomolecular Engineering	Johns Hopkins University Department of Chemical and Biomolecular Engineering; Advisor: Justin Hanes; Thesis: Mucosal Barriers to Gene Delivery in the Lung	2000-2005
B.S. in Biomedical Engineering	Louisiana Tech University Department of Biomedical Engineering; Ruston, Louisiana; Summa cum laude	1995-1999

PUBLICATIONS

❖ Journal Articles

1. Sun J, Jia S, Shao C, Dawson M, Toussaint K (2025). Emerging Technologies for Multiphoton Writing and Reading of Polymeric Architectures for Biomedical Applications. Annual Review of Biomedical Engineering 27.
2. Howes A, Dea N, Ghosh D, Krishna K, Wang Y, Morrison B, Toussaint C, Dawson M (2024). Fibroblast senescence-associated extracellular matrix promotes heterogeneous lung niche. APL Bioeng. 8, 026119.
3. Sun J, Howes A, Jia S, Burrow J, Felzenszwalb P, Dawson M, Shao C (2024), Toussaint K. Automated Brightfield Layerwise Evaluation in 3D Micropatterning via Two-Photon Polymerization. Optics Express 32 (7), 12508-12519.
4. Jia S, Sun J, Howes A, Dawson M, Toussaint K, Shao C (2024). Hybrid Physics-Informed Data-Driven Geometric Accuracy Prediction for Hemisphere Structures Produced by 2Photon Lithography. Journal of Manufacturing Processes 110, 202-210.
5. Mejia Pena C, Skipper T, Hsu H, Schechter I, Ghosh D, Dawson M (2023). Paclitaxel Induced Metabolic Reprogramming of HGSOc in a Spatiotemporally Regulated 3D Model. Scientific Reports 13: 19232.
6. Ghosh D, Hsu J, Soriano K, Mejia-Pena C, Lee A, Dizon D, Dawson M (2023). Spatial Heterogeneity in Cytoskeletal Mechanics Response to TGF- β 1 and Hypoxia Mediates Partial Epithelial-to-Mesenchymal Transition in Epithelial Ovarian Cancer Cells. Cancers 15(12):3186.
7. Schutte S, Ghosh D, Zupan A, Warwar R, Dawson M (2023). Differential Response to Mechanical Cues in Uterine Fibroid vs. Paired Myometrial Cells. Reproductive Sci 57.
8. Lee A, Ghosh D, Koh I, Dawson M (2023). Senescence-Associated Exosomes Transfer MiRNA-Induced Fibrosis to Neighboring Cells. Aging 15 (5): 1237-1256.
9. Xuan B, Ghosh D, Jiang J, Shao R, Dawson M (2020). Vimentin Filaments Drive Migratory Persistence in Polyploid Cancer Cells. PNAS 117 (43), 26756-65.
10. Lee AH, Ghosh D, Quach N, Schroeder D, Dawson M (2020). Ovarian Cancer Exosomes Trigger Differential Biophysical Response in Tumor-Derived Fibroblasts. Scientific Reports 10 (1), 1-16.
11. Ghosh D, Mejia Pena C, Quach N, Xuan B, Lee A, Dawson M (2020). Senescent Mesenchymal Stem Cells Remodel Extracellular Matrix Driving Breast Cancer Cells to a More-Invasive Phenotype. Journal of Cell Science 133 (2):1-12.
12. Quach N, Kaur, S, Eggert M, Ingram L, Ghosh D, Sheth S, Nagy T, Dawson M, Arnold R, Cummings B (2019). Paradoxical Role of Glypican-1 in Prostate Cancer Cell and Tumor Growth. Scientific Reports 9 (1), 1-15.
13. Xuan B, Ghosh D, Cheney E, Clifton E, Dawson M (2018). Dysregulation in Actin Cytoskeletal Organization Drives Increased Stiffness and Migratory Persistence in Polyploid Giant Cancer Cells. Scientific reports 8 (1), 1-13.
14. Ali M, Wu Y, Ghosh D, Do B, Chen K, Dawson M, Fang N, Sulchek T, El-Sayed M (2017). Gold Nanoparticles trapped at Nucleus Membrane Enhance the Nuclear Stiffness Causing Inhibition of Cancer Cell Migration, Invasion, and Motility by Modifying Nuclear Lamin A/C Protein. ACS Nano 11: 3716-26.

15. Ghosh D, McGrail D, Dawson M (2017). TGF- β 1 Pretreatment Improves the Function of Mesenchymal Stem Cells in the Wound Bed. Microenvironment Derived Stem Cell Plasticity. *Frontiers in Cell and Developmental Biology* 5: 28.
16. McAndrews K, Yi J, McGrail D, Ravikumar N, Dawson M (2015). Mesenchymal Stem Cells Induce Directional Migration of Invasive Breast Cancer Cells through TGF- β . *Scientific Reports* 5: 16,941.
17. McGrail D, Patel K, Khambati N, Pithadia K, Dawson M (2015). Utilizing Temporal Variations in Chemotherapeutic Response to Improve Breast Cancer Treatment Efficacy. *AIMS Bioengineering* 2(4): 310-23.
18. McGrail D, McAndrews K, Brandenburg C, Ravikumar N, Kieu Q, Dawson M (2015). Osmotic Regulation is Required for Cancer Cell Survival under Solid Stress. *Biophysical Journal* 109(7): 1334-7.
19. McAndrews K, Yi J, McGrail D, Dawson M (2015). Enhanced Adhesion of Stromal Cells to Invasive Cancer Cells Regulated by Cadherin 11. *ACS Chemical Biology* 10(8):1932-38.
20. McGrail D, Kieu Q, Iandoli J, Dawson M (2015). Actomyosin Tension as a Determinant of Metastatic Cancer Mechanical Tropism. *Physical Biology* 12(2):026001.
21. McGrail D, Qi M, Khambhati N, Patel, K, Dawson M (2015). Alterations in Ovarian Cancer Cell Adhesion Drive Taxol Resistance by Increasing Microtubule Dynamics in a FAK-dependent Manner. *Scientific Reports* 5:9529.
22. McGrail D, Kieu M, Mezencev R, McDonald J, Dawson M (2015). SNAIL-Induced Epithelial-to-Mesenchymal Transition (EMT) Produces Concerted Biophysical Changes from Altered Cytoskeletal Gene Expression. *FASEB J* 29(4):1280-9.
23. Datla S, McGrail D, Lyle A, Pounkova L, Hilenski L, Dawson M, Lassègue B, and Griendling K (2014). Poldip2 Controls Vascular Smooth Muscle Cell Migration by Regulating Focal Adhesion Turnover and Polarization. *Applied Journal of Physiology* 307 (7): H945-57.
24. McAndrews K, McGrail D, Quach N, Dawson M (2014). Spatially Coordinated Changes in Intracellular Rheology and Extracellular Force Exertion During Mesenchymal Stem Cell Differentiation. *Physical Biology* 11: 056004.
25. McAndrews K, Kim F, Lam T, McGrail D, Dawson M (2014). Architectural and Mechanical Cues Direct Mesenchymal Stem Cell Interactions with Cross-Linked Gelatin Scaffolds. *Tissue Engineering Part A*, 20(23-24):3252-60.
26. McGrail D, Kieu Q, Dawson M (2014). The Malignancy of Metastatic Ovarian Cancer Cells is Increased on Soft Matrices Through a Mechanosensitive Rho-ROCK Pathway. *Journal of Cell Science* 127, 2621-2626. Featured on the Cover.
27. Ghosh D, Lilli L, McGrail D, Matyunina L, McDonald J, Dawson M (2014). TGF- β 1 Induced Stiffening of Mesenchymal Stem Cells Depends on PDGF-BB Signaling, *Stem Cells and Development* 23(3): 245-61.
28. *Don-Salu-Hewage A; Chan A; McAndrews K; Chetram M; Dawson M; Bethea D; Hinton C (2013). Cysteine (C)-X-C Receptor 4 Undergoes Transportin 1-Dependent Nuclear Localization and is Functional at the Nucleus of Metastatic Prostate Cancer Cells, *PLoS ONE* 7 (8): e57194.

29. McGrail D, McAndrews K, Dawson M (2013). Biomechanical Analysis Predicts Decreased Human Mesenchymal Stem Cell Function before Molecular Differences, *Experimental Cell Research* 319: 684-696.
30. McGrail D, Ghosh D, Quach N, Dawson M (2012). Differential Mechanical Response of Mesenchymal Stem Cells and Fibroblasts to Tumor-Secreted Soluble Factors, *PLoS ONE* 7 (3): e33248.
31. Suk, JS, Lai S, Dawson M, Boylan, N, Boyle, Hanes J (2011). Rapid Transport of Muco-Inert Nanoparticles in CF Sputum Treated with NAC, *Nanomedicine* 6 (2): 365-75.
32. Dawson M, Chae S, Jain RK, Duda D (2011). Cell Lineage-dependent Effects of Bone Marrow Stromal Cells on Tumor Progression, *American Journal of Cancer Research* 1(2):144-154.
33. Kozin, SV, Kamoun, WS, Huang, Y, Dawson, M, Jain, RK, Duda, DG (2010). Rapid Macrophage Infiltration after Local Irradiation Facilitates Tumor Re-Growth Whereas TEMs and not EPCs Recruitment Facilitates Relapse of Irradiated Tumors, *Cancer Research* 70(14): 5679-85.
34. Dawson M, Duda D, Chae S, Fukumura D, Jain RK (2009). VEGFR1 Activity Modulates Myeloid Cell Infiltration in Growing Lung Metastases but is Not Required for Spontaneous Metastasis Formation, *PLoS ONE* 4(9): e6525.
35. Tang B, Dawson M, Lai S, Wang YY, Suk, JS, Yang M, Zeitlin P, Boyle M, Fu J, Hanes J (2009). Biodegradable Polymer Nanoparticles that Rapidly Penetrate the Human Mucus Barrier, *Proceedings of the National Academy of Sciences* 106(46):19268-73. Featured on the Cover (>407 citations).
36. Dawson M, Duda D, Fukumura D, Jain RK (2009). VEGFR1-Activity Independent Metastasis Formation, *Nature* 461: E4.
37. Perentes JY, McKee TD, Ley CD, Mathiew H, Dawson M, Padera TP, Munn LL, Jain RK, Boucher Y. In Vivo Imaging of Extracellular Matrix Remodeling by Tumor-Associated Fibroblasts, *Nature Methods*, 6(2):143-5 (2009).
38. Suh J, Dawson M, Hanes J. (2005). Real-Time Particle Tracking: Applications to Drug and Gene Delivery, *Advanced Drug Delivery Reviews* 57:63-78.
39. Dawson M, Krauland E, Wirtz D, Hanes J. (2004). Transport of Polymeric Nanoparticle Gene Carriers in Gastric Mucus, *Biotechnology Progress*, 20(3):851-857.
40. Dawson M, Wirtz D, and Hanes J. (2003). Enhanced Viscoelasticity of Human Cystic Fibrotic Sputum Correlates with Increasing Microheterogeneity in Particle Transport, *Journal of Biological Chemistry*, 278:50393-50401.

❖ **Review Articles**

1. Lee A, Koh L, Dawson M (2022). Review: The Role of Exosome Heterogeneity in Epithelial Ovarian Cancer. *Advances in Cancer Biology-Metastasis* 4: 100040.
2. Lee A, Mejia Pena C, Dawson M (2022). Review: Differences Between the Secretomes of Chemo-Refractory and Chemo-Resistant Ovarian Cancer Populations. *Cancers* 14 (6), 1418.
3. Xuan B, Ghosh D, Dawson M (2021). Contribution of the Distinct Biophysical Phenotype of Polyploid Giant Cancer Cells to Cancer Progression. *Seminars in Cancer Biology*, S1044-579X (21), 00144-9.

❖ **Book Chapters**

1. Mejia Pena C, Lee A, Frare M, Ghosh D, Dawson M (2023). Hallmarks of an Aging and Malignant Tumor Microenvironment and the Rise of Resilient Subpopulations. Engineering and Physical Approaches to Cancer. ISBN-13: 9783031228018. Springer International Publishing. Co-Edited by Michelle Dawson and Ian Wong.
2. Dawson M, Xuan B, Hsu J, Ghosh D (2020). Force balancing ACT-IN the Tumor Microenvironment: Cytoskeletal Modifications in Cancer and Stromal Cells to Promote Malignancy. IRCMB: Actin Cytoskeleton in Cancer Progression and Metastasis – Part B Volume 356. Edited by Clement Thomas and Lorenzo Galluzzi, Elsevier Publishing.
3. Ghosh D, Dawson M (2018). Microenvironment Influences Cancer Cell Mechanics from Tumor Growth to Metastasis. Biomechanics in Oncology, 69-90. Advances in Experimental Medicine and Biology, Volume 1092. Edited by Konstantopoulos, Dong, and Kuhn. Springer Publishing.
4. Dawson M, Ghosh D (2016). Mucosal Barriers. Drug Delivery Across Physiological Barriers. Edited by Silvia Muro 155-180, Pan Stanford Publishing.
5. Dawson M, Tseng Y, Lee J, McAndrews K (2014). Intracellular Particle Tracking Rheology. Handbook of Imaging in Biological Mechanics. Edited by Corey Neu and Guy Genin, 381-388, CRC Press.
6. Hanes J, Dawson M, Har-el Y, Suh J, Fiegel J (2003). Gene Delivery to the Lung. Pharmaceutical Inhalation Aerosol Technology, Edited by AJ Hickey, 2nd Ed., 489-539. Marcel Dekker Incorporated.

❖ **Books and Special Issues**

1. Dawson M (2023). Special Issue: Molecular and Cellular Heterogeneity in an Evolving Tumor Landscape: When Diversity Gives Rise to Aggressive and Drug Resistant Cells. Cancers. Guest edited by Michelle Dawson.
2. Dawson M (2023). Engineering and Physical Approaches to Cancer. Series: Current Cancer Research. ISBN-13: 9783031228018. Springer International Publishing. Co-Edited by Michelle Dawson and Ian Wong.

PRESENTATIONS❖ **Invited Oral Presentations (by Michelle Dawson)**

Note: Talks highlighted in blue – International; brown – Local; black – National

This only includes work since moving to Brown; 2016-current.

Syracuse University, Department of Physics Seminar	2024
MD Anderson Conference on Polyploid Cells, Invited Speaker	2024
NSF Molecular and Cellular Biosciences Outreach Conference, Invited Flash-talk	2024
University of Illinois at Chicago, Biology Seminar	2024
National Cancer Institute, Cancer Cell Biology Department Seminar	2023
RCMI Conference, NRMN SETH Alumni Panel	2023
California State University, Biology Graduate Student Seminar	2023
Arizona State University, Chemical Engineering Graduate Student Seminar	2023

Brown University Cancer Center: Breast Cancer Translational Research Group	2023
AACR Special Meeting: Aging and Cancer: Tumor Microenvironment Session	2022
AICHE Annual Meeting, Regenerative Medicine Society	2022
Michigan Technological University, Chemical Engineering Graduate Seminar	2022
University of Nebraska, Chemical & Biomolecular Engineering Graduate Seminar	2022
University of North Texas, BMEN Graduate Student Seminar	2022
Christopher Newport University, Molecular Biology and Chemistry Seminar	2022
Johns Hopkins Medical School, Center for Nanomedicine Seminar	2022
Ohio University, Basic and Translational Research Seminar	2022
Northeastern University, Pharmaceutical Sciences Seminar	2022
Society of Engineering Science Biomechanics and Mechanobiology Symposium	2022
Brown University Cancer Center: Breast Cancer Translational Research Group	2022
International Cancer Research Symposium: Polyploidy	2021
Johns Hopkins Bloomberg Public Health, Biochemistry & Mol Biology Seminar	2021
Boston University, Mechanobiology Symposium. Rising Star Talk	2021
Texas A&M University, Graduate Student Biomedical Engineering Seminar	2021
Brown University Cancer Center: Gyn Cancer Translational Research Group	2021
AICHE Annual Meeting, Area 15D/E Eng in Life Sciences, Cancer Bioengineering	2020
Howard University, Department of Physiology and Biophysics Seminar	2020
American Cancer Society Cancer Action Network of Rhode Island Panel	2019
Writing Successful Grant Proposals in STEM, Conf of the Ford Fellows Panel	2019
University of Vermont, Graduate Student Biomedical Engineering Seminar	2019
Brown University Cancer Center: Breast Cancer Translational Research Group	2019
Brown University Cancer Center: Gyn Cancer Translational Research Group	2019
5th Year Master's Opportunities in Cellular and Molecular Therapeutics Panel	2019
Brown University: MCB Graduate Program Retreat	2019
Brown University Cancer Center: Cancer Biology Group Meeting	2019
Brown University Cancer Center: Breast Cancer Translational Research Group	2019
University of Rhode Island, Amgen Seminar Series in Chemical Engineering	2018
Brown University: Stem Jazz Lunch Series	2018
Brown University: MCB Fall Seminar Series	2018
Women & Infants Pathology Department Seminar	2018
Brown University Cancer Center: Ovarian Cancer Research Group Seminar	2018
Brown University: MCB Fall Seminar Series	2018
UC San Diego NSF INCLUDES Conference Panel	2017
Brown University: Biology of Aging Retreat Talks	2017
Graduate Students of Color Orientation, CV Building Talk	2017
Brown University: MPPB Graduate Program Retreat Talk	2017
Brown University: BME Fall Seminar	2016
Rhode Island Hospital: Orthopedics Research Seminar	2016
Brown University: MMI Fall Seminar	2016
Brown University: MCB Fall Seminar	2016
Rhode Island Hospital Pathology Seminar	2016

Engineering Conference International (ECI), Vienna, Austria 2016

❖ **Poster and Oral Presentations (by members of the Dawson lab)**

Note: blue – International; brown – Local; black – National presentations; 2016-current

BMES Annual Conference. White B, Ghosh D, Dawson M (White Poster) 2024
 BMES Annual Conference. Lu X, Ghosh D, Dawson M (Lu Poster) 2024
 BMES Annual Conference. Ghosh D, Howes A, Dawson M (Ghosh Poster) 2024
 NSF MCB Outreach Conference. Dawson M (Oral, Poster, & Panel Participant) 2024
 GRC: Physics of Cancer. Ghosh D, Howes A, Lee A, Dawson M (Dawson Oral) 2023
 TAMU SES Meeting. Mejia Pena, Lee, Perricone, Ghosh, Dawson (Dawson Oral) 2022
 ASCB Annual Conference. Lee A, Ghosh D, Dawson M (Lee Oral) 2021
 BMES Annual Conference. Lee A, Ghosh D, Dawson M (Lee Poster) 2021
 Experimental Biology. Mejia Pena C, Skipper T, Hsu J, Dawson M (Mejia Pena Oral) 2021
 Experimental Biology. Lee A, Ghosh D, Dawson M (Lee Oral) 2021
 Memorial Sloan Kettering Cancer Center. (Mejia Pena - Invited Speaker) 2021
 NESS. Mejia Pena C, Skipper T, Hsu J, Schechter I, Dawson M (Mejia Pena Poster) 2021
 Brown University CBME Retreat. (Lee - Invited Speaker) 2021
 American Society for Extracellular Vesicles. Lee A, Ghosh D, Dawson M (Lee Oral) 2020
 Carnegie Mellon Forum on BME and IAMBE (Lee Poster) 2020
 NESS. Mejia Pena C, Skipper T, Hsu J, Schechter I, Dawson M (Mejia Pena Poster) 2020
 NESS. Lee A, Ghosh D, Quach N, Dawson M (Lee - 3rd Place Oral Presentation) 2020
 Stem Cells and Aging COBRE at Brown University (Lee Oral) 2020
 BMES Annual Conference. Ghosh D, Quach N, Dawson M (Ghosh Poster) 2019
 BMES Annual Conference. Xuan B, Ghosh D, Jiang J, Dawson M (Xuan Poster) 2019
 BMES Annual Conference. Lee A, Ghosh D, Quach N, Dawson M (Lee Poster) 2019
 BMES Annual Conference. Mejia Pena C, Hsu J, Skipper T, Dawson M (MP Poster) 2019
 BMES Annual Conference. Skipper T, Mejia Pena C, Dawson M (Skipper Oral) 2019
 Radiological Society of North America. Beland M, Ghosh D, Dawson (Beland Oral) 2019
 NESS. Mejia Pena C, Hsu J, Skipper T, Dawson M (Mejia Pena Poster) 2019
 GRC: Physics of Cancer. Ghosh D, Dawson M (Dawson Poster) 2019
 Nabrit Conference for Early Career Scholars (Mejia Pena Poster) 2019
 MCB Retreat. Mejia Pena - Invited Speaker 2019
 GRC: Signal Transduction by Engineered Extracellular Matrices. (Dawson Poster) 2018
 BMES - CMBE Conference. Dawson M, Ghosh D, Xuan B (Dawson Poster) 2018
 AACR Annual Meeting. Dawson M, Xuan B, Ghosh D (Dawson Poster) 2018
 Experimental Biology. Bedoya S, Ghosh D, Dawson M. (Bedoya Poster) 2018
 MCB Retreat (Mejia Pena Poster) 2018
 Brown Summer Research Symposium. Hsu J, Ghosh D, Dawson M (Hsu Poster) 2018
 Brown Summer Research Symposiu. Gibbs S, Quach N, Dawson M (Gibbs Poster) 2018
 AACR Annual Meeting. Quach, Eggert, Dawson, Arnold, Cummings (Quach Poster) 2017
 MCB Retreat. Mejia Pena C, Dawson M (Mejia Pena Poster) 2017
 Brown Summer Research Symposium. Clifton E, Xuan B, Dawson M (Clifton Poster) 2017
 Brown Summer Research Symposium. Soriano K, Ghosh, Dawson (Soriano Poster) 2017
 Brown Summer Research Symposium. Skipper T, Ghosh, Dawson (Skipper Poster) 2017

Brown Summer Research Symposium. Acero S, Ghosh D, Dawson M (Acero Poster) 2017
 First Year Molecular Pharmacology and Physiology Talks (Xuan Oral) 2017
 Engineering Conference International (ECI), Vienna, Austria (Dawson Oral) 2016

❖ **Other Publications and Creative Products**

Press: <https://oncodaily.com/insight/92329> 2024
Press: <https://legorreta.brown.edu/news/2024-08-01/announcement-leadership-appointment> 2024
Press: <https://www.csunbiosphere.org/2023/04/28/colloquium-dawson-on-polyploid-cancer-cells-and-tactics-to-target-them-for-treatment/> 2023
Press: Medicine@Brown, Feature Article on PGCC Work
<https://medicine.at.brown.edu/giant-cells-break-the-rules/#prettyPhoto> 2022
Podcast: Innovation Out of Failure, 2022
<https://www.facebook.com/watch/?v=337323411676946>
Press: BU Rising Star Faculty 2021
<https://www.bu.edu/mechanobiology/rising-star-faculty-michelle-r-dawson/>
Podcast: The Scientists' Channel 2021
<https://www.thescientistschannel.com/michelle-dawson>
Press: Polyploidy work featured in Brown Daily Herald and social media 2020
Press: Senescence work featured in Brown Daily Herald and social media 2020
Press: Polyploidy work featured in Brown Medicine, Brown Daily Herald 2018
Press: Polyploidy work featured on BioPortfolio, EurekAlert, Science Daily, ... 2018
US Patent: Hanes J, Dawson M, Wirtz D, Fu J, Krauland E, Drugs and gene carrier particles that rapidly move through mucus barriers. Application number 10,587,512 (1st submitted in **2005**). Patent US20210052507A1 (Published **2021**) 2005

RESEARCH FUNDING

❖ **Current Grants**

Project Title: Senescence-Associated Modifications in the Fibrotic Lung Niche for Breast Cancer Metastasis (7139177/7139453)

Funding Source: **COBRE SCA-Aging, Lifespan and Rhode Island Hospital**

Total Funding Awarded and For My Portion of the Project: **\$50,000**, Role: PI

Period of Contract: 8/1/2024 – 7/31/2025, Candidate's Share: 100%

Project Title: Administrative Supplement for Equipment: Lipid Metabolism Switch Triggers Invasive and Chemoresistant Epithelial Ovarian Cancer Phenotype (3R01CA266415-01A1)

Funding Source: **National Institutes of Health**

Total Funding Awarded and For My Portion of the Project: **\$30,101**, Role: PI

Period of Contract: 03/16/2023, Candidate's Share: 100%

Project Title: Lipid Metabolism Switch Triggers Invasive and Chemoresistant Epithelial Ovarian Cancer Phenotype (1R01CA266415-01A1)

Funding Source: **National Institutes of Health**

Total Funding Awarded and For My Portion of the Project: **\$1,760,000**, Role: PI

Period of Contract: 08/09/22-08/09/27, Candidate's Share: 100%

❖ **Completed Grants – Brown University**

Project Title: Collaborative Research: A Digital Manufacturing Platform to Democratize Biological Tissue Access Using Smart Two-Photon Polymerization (2043243)

Funding Source: **National Science Foundation**

Total Funding Awarded and For My Portion of Project: **\$500,000/\$250,000**, Role: Co-PI

Period of Contract: 05/01/21-04/30/24, Candidate's Share: 50%

Project Title: REU Supplement - A Digital Manufacturing Platform to Democratize Biological Tissue Access Using Smart Two-Photon Polymerization (007651)

Funding Source: **National Science Foundation**

Total Funding Awarded and For My Portion of the Project: **\$13,400/\$8,000**, Role: Co-PI

Period of Contract: 08/01/23-07/31/24, Candidate's Share: 60%

Project Title: Standard Award: Investigating the Biophysics of Giant Polyploid Cancer Cells in an Aging Tumor Stroma (1825174)

Funding Source: **National Science Foundation**

Total Funding Awarded and For My Portion of the Project: **\$350,000**, Role: PI

Period of Contract: 08/15/18-07/31/22, Candidate's Share: 100%

Project Title: Research Supplement - Investigating the Biophysics of Giant Polyploid Cancer Cells in an Aging Tumor Stroma (2133460)

Funding Source: **National Science Foundation**

Total Funding Awarded and For My Portion of the Project: **\$99,259**, Role: PI

Period of Contract: 08/01/21-11/30/22, Candidate's Share: 100%

Project Title: REU Supplement - Investigating the Biophysics of Giant Polyploid Cancer Cells in an Aging Tumor Stroma (006188)

Funding Source: **National Science Foundation**

Total Funding Awarded and For My Portion of the Project: **\$8000**, Role: PI

Period of Contract: 08/01/21-07/31/22, Candidate's Share: 100%

Project Title: Molecular and Mechanical Regulators of the Metastatic Niche and Ovarian Cancer Metastasis (005756)

Funding Source: **COBRE, Lifespan Center for Cancer Research Development**

Total Funding Awarded and For My Portion of the Project: **\$50,000**, Role: PI

Period of Contract: 10/1/2017 – 6/30/2018, Candidate's Share: 100%

Project Title: Role of Senescence Associated Exosomes in Radiation-Induced Fibrosis

Funding Source: **Research Seed Funds, OVPR**, Brown University

Total Funding Awarded and For My Portion of the Project: **\$30,000**, Role: PI

Period of Contract: 2/21/2021 – 7/01/2022, Candidate's Share: 100%

Project Title: Clinical Relevance of PGCCs and Biomarker Identification
Funding Source: **Legoretta Cancer Center at Brown University** Pilot Project Award
Total Funding Awarded and For My Portion of the Project: **\$25,000**, Role: PI
Period of Contract: 01/1/21-12/1/21, Candidate's Share: 100%

Project Title: Developing 3D Organoid Culture to Identify Drivers of Cancer Progression
Funding Source: **OVPR Grant Resubmission Funds** (for NSF resubmission to EBMS)
Total Funding Awarded and For My Portion of the Project: **\$15,000**, Role: PI
Period of Contract: 08/1/18-08/1/19, Candidate's Share: 100%

Project Title: Using Single Cell Biophysics and Shear Wave Ultrasound Elastography to Measure Cancer Mechanics Across Multiple Length Scales
Funding Source: **Research Seed Funds, OVPR**, Brown University
Total Funding Awarded and For My Portion of the Project: **\$50,000/\$25,000**, Role: Co-PI
Period of Contract: 1/26/2017 – 6/30/2018, Candidate's Share: 50%

Project Title: Toward the Development of Molecular Therapeutics for Uterine Leiomyoma: 3D Mechanical Culture Models for Dissecting the Molecular Signaling Pathways Mediating Fibroid Growth and Development
Funding Source: **GTEC (seed grant)**
Total Funding Awarded and For My Portion of the Project: **\$70,000/\$35,000**, Role: Co-PI
Period of Contract: 10/1/2014-6/30/2015, Candidate's Share: 50%

Project Title: Direct-to-Discover Race to the Top K12 Outreach Grant (1411304)
Funding Source: **State of Georgia**
Total Funding Awarded and For Your Portion of the Project: **\$1,500,000/\$40,000**, Role: Senior Personnel, Collaborators: Barrow County Schools and GTRI
Period of Contract: 9/1/2012-6/30/2014, Candidate's Share: ~3%

Project Title: Standard Award: Engineering Mesenchymal Stem Cells for More Rapid Wound Healing (1066585)
Funding Source: **National Science Foundation**
Total Funding Awarded and For Your Portion of the Project: **\$298,850**, Role: PI
Period of Contract: 7/15/2011 – 8/1/2014, Candidate's Share: 100%

Project Title: Anti-Angiogenic Mesenchymal Stem Cell-Based Therapy for Metastatic Melanoma
Funding Source: **GTEC (seed grant)**
Total Funding Awarded and For Your Portion of the Project: **\$30,000**, Role: PI
Period of Contract: 9/1/2012-6/30/2013, Candidate's Share: 100%

Project Title: Engineering Mesenchymal Stem Cells for More Rapid Wound Healing
Funding Source: **GTEC (seed grant)**
Total Funding Awarded and For Your Portion of the Project: **\$35,000**, Role: PI
Period of Contract: 8/16/2010-6/30/2011, Candidate's Share: 100%

Project Title: BRIGE to Career Award: Understanding the Mechanical Properties of Migrating MSCs (1032527)

Funding Source: **National Science Foundation**

Total Funding Awarded and For Your Portion of the Project: **\$174,990**, Role: PI

Period of Contract: 9/1/2010-8/31/2012, Candidate's Share: 100%

Project Title: MSC-Based Therapeutics for the Treatment of Breast Cancer (110257)

Funding Source: **Georgia Cancer Coalition**

Total Funding for My Portion of the Project: **\$50,000**, Role: PI

Period of Contract: 2/1/2009 – 2/1/2010, Candidate's Share: 100%

COLLABORATIONS

Dr. Jack Elias, Warren Alpert Foundation Professor of Translational Science. We collaborate on treatment strategies involving Chi3L1 for extracellular matrix modifications in the aging and or irradiated lung.

Dr. Don Dizon, Director of Medical Oncology, Rhode Island Hospital. We collaborate on ovarian cancer lipid metabolism and identification of polyploid giant cancer cells in breast and ovarian cancer tissues.

Dr. Yihong Wang, Professor of Pathology and Laboratory Medicine, Rhode Island Hospital. We collaborate on the identification of polyploid giant cancer cells in breast cancer tissues and collagen matrix remodeling in pulmonary fibrosis.

Dr. Michael Beland, Professor of Diagnostic Imaging, Rhode Island Hospital. We collaborate on the biomechanical characterization of biopsy tissues and cells.

Dr. Kimani Toussaint, Professor and Senior Associate Dean in the School of Engineering at Brown University. We collaborate in the areas of non-linear extracellular matrix behavior quantified using second harmonic generation imaging and novel quantitative analysis.

Dr. Wafik El-Deiry, Associate Dean for Oncologic Sciences at the Warren Alpert Medical School, Director of the Cancer Center at Brown University, and Director of the Joint Program in Cancer Biology at Brown University. Our current collaboration is based on our work on dormant polyploid giant cancer cells as therapy induced senescent cancer cells that alter the tumor microenvironment to promote cancer.

Dr. John Sedivy, Hermon C. Bumpus Professor of Biology, Associate Dean and Director, Center for the Biology of Aging. Our current collaborations are on genetically engineering polyploid giant cancer cells to look at metabolic and biophysical alterations in breast cancer.

Dr. Stacey Schutte, Assistant Professor in Biomedical Engineering, University of Cincinnati. We collaborate on women's health studies related to tumor fibroid mechanics.

ACADEMIC HONORS AND FELLOWSHIPS

Dean's Research Bonus for excellent research and funding efforts	2024
Rising Star Faculty Member , CMTM Symposium	2021

AACR Minority Faculty Scholar in Cancer Research Award	2018
Women in Engineering (WIE) Teaching Excellence Award	2013
GT Junior Faculty Outstanding Undergraduate Research Mentor Award	2013
Georgia Cancer Coalition Breast Cancer Research Award	2009
Carl Storm Minority Fellowship for GRC Travel Award	2007
Ford Foundation Postdoctoral Minority Fellowship	2006
CRS-Capsugel/Pfizer Innovative Aspects of Oral Drug Delivery Award	2004
Science and Engineering Education Scholars Program Travel Award	2004
Biophysical Society FASEB MARC Travel Award	2003
International Society for Aerosol Medicine Student Research Award	2003
Achievement Rewards for College Students Fellowship	2000
Ford Foundation Predoctoral Minority Fellowship	2001
National Science Foundation Graduate Research Fellowship	2001
Louisiana Tech Biomedical Engineering Outstanding Senior Award	1999
❖ NCI Grantee Workshops and Opportunities	
NCI Division of Cancer Biology New Grantee Workshop	2023
NCI Awardee Skills Development Workshop: Immuno-Oncology	2023
NCI Awardee Skills Development Workshop: UPENN-CHOP Cell & Gene Delivery	2023
RCMI Consortium National Conference: DEI Research	2023
NRMN SETH Grant Writing Workgroup	2020
❖ Honors and Awards to my Trainees	
Sidney Frank Fellow – outstanding BME student Xingjian (Gavin) Lu	2024
Senior Biology Prize to Outstanding Teaching Assistant - Dennis Kinyua	2023
Elizabeth Leduc Prize in Cell and Molecular Biology to Outstanding Undergraduate Research Assistant - Matthew Perricone	2022
Lealyn B. Clapp Prize for Outstanding Thesis to Undergraduate Research Assistant - Allison Lin	2021
Joukowsky Family Foundation Outstanding Dissertation Award to Outstanding Graduate Student - Botai Xuan	2020
3rd Place Oral Presentation at the New England Science Symposium, Awarded to Graduate Student - Amy Lee	2020
Senior Biology Prize, Awarded to Outstanding Undergraduate Research Assistant - Kylen Soriano	2018
Brown Respiratory Research Training Program 2-Year Postdoctoral Fellowship – Awarded to my postdoc Nhat Quach	2018
National Science Foundation Graduate Research Fellowship – Awarded to my Graduate Student Carolina Mejia Pena	2018

TEACHING

COURSES TAUGHT AT BROWN UNIVERSITY

BIOL 2010A: Introduction to Molecular Research in Life Sciences (Faculty on Parade)

Fall 2023: 16 students

BIOL 1810: 21st Century Applications in Cell and Molecular Biology

Spring 2023: **55 students** (**4.5/5** instructor effectiveness score, 5 being the highest)

BIOL 1810: 21st Century Applications in Cell and Molecular Biology

Spring 2021: 30 students (**4.5/5** instructor effectiveness score, 5 being the highest)

BIOL 1810: 21st Century Applications in Cell and Molecular Biology

Spring 2020: 25 students (**4.5/5** instructor effectiveness score, 5 being the highest)

BIOL 0810: Applied Cell and Molecular Biology

Spring 2019, 13 students (**2/5** – scoring was flipped with 1 being highest, 5-lowest).

BIOL 0810: Applied Cell and Molecular Biology

Spring 2018, 3 students (**1.5/5** – scoring was flipped with 1 being highest, 5-lowest).

INDEPENDENT STUDIES AT BROWN UNIVERSITY

BIOL 1950/1960: Independent Study

Fall 2016: Oksana Goretaya

Spring 2017: Oksana Goretaya, Jeffrey Hsu, Kylan Soriano

Fall 2017: Emily Cheney, Elizabeth Clifton, Kylan Soriano

Spring 2018: Emily Cheney, Elizabeth Clifton, Kylan Soriano, Thomas Skipper

Fall 2018: Jeffrey Hsu, Joy Jiang, Devin Schroeder, Thomas Skipper

Spring 2019: Jeffrey Hsu, Joy Jiang, Devin Schroeder, Thomas Skipper

Fall 2019: Allison Lin, Devin Schroeder

Spring 2020: Allison Lin, Devin Schroeder

Fall 2020: Ilexa Schechter

Spring 2021: Ilexa Schechter

Fall 2021: Ilexa Schechter

Spring 2022: Matthew Perricone, Ilexa Schechter

Fall 2022: Ivy Koh

Spring 2023: Nova Dea

Fall 2023: Ivy Koh, Nova Dea, Noah Bingham

GUEST LECTURES AT BROWN UNIVERSITY

BIOL 0100 Guest Speaker.

Title of presentation: "Biophysics of Polyploid Giant Cancer Cells."

BIOL 2910 Guest Speaker (2019, 2020, 2021)

Title of presentation: "Successful NSF and Ford Fellowship Applications."

BIOL 1050/2050 Guest Speaker (2021, 2022)

Title of presentation: "Extracellular Matrix Biology"

Warren Alpert Medical School Workshop for Continuing Medical Education (ACCME). Presented talk in Rhode Island Women's Health Summit, Not Your Grandma's

Mammogram – Update on Breast Health for 2022. Title: “Senescence-Associated Extracellular Matrix Modifications in Breast Cancer.” May 25, 2022.

Panelist for Sheridan Center Roundtable Discussion: Hybrid Teaching, 2021.

Questar III New Visions Medical Program. Presented research to 30 advanced 12th grade science students from upstate New York. Title: “Biophysics and Medicine.”

❖ **Courses taught at Georgia Tech:**

ChBE 3210: Heat and Mass Transfer – 12 sections, 400 students

ChBE 3200: Fluid Transport Dynamics – 2 sections, 125 students

ChBE 4803: Biomolecular Engineering of the Cell – 3 sections, 110 students

MENTORING AT BROWN UNIVERSITY

❖ **Graduate Students**

1. Botai Xuan, PhD student

Department: Molecular Pharmacology, Physiology, and Biotechnology

Project: Polyploid Giant Breast Cancer Cells that Drive Paclitaxel Resistance

Joukowsky Outstanding Dissertation Award, 2020

Current Position: R&D Manager, Izon Sciences

2. Carolina Mejia Pena, PhD student

Department: Molecular Biology, Cell Biology, and Biochemistry

Project: 3D Model of Chemoresistant Ovarian Cancer Metabolism

Current Position: Postdoc at Harvard University

3. Amy Lee, PhD student

Department: Biomedical Engineering

Project: Exosome-Mediated Interactions in Ovarian Cancer Metastasis

Current Position: Postdoc in Robert Langer’s lab, MIT

4. Andrew Howes, PhD student (co-advised with Kimani Toussaint)

Department: Biotechnology

Project: Non-Linear Optics of 3D Collagen Matrices in Fibrotic Tissues

Defended thesis 11/6/2023

5. Basel White, PhD student

Department: Biomedical Engineering

Project: Lipid Metabolism Effects on Tumor Microenvironment Interactions and Chemoresistance in Aggressive Ovarian Cancers

Expected Graduation: 2028

6. Gavin Lu, PhD student

Department: Biomedical Engineering

Project: Links Between Subcellular Structure and Autophagy in Polyploid Giant Ovarian Cancer Cells

Expected Graduation: 2028

7. Brianna Pendergrass, PhD student

Department: Molecular Biology, Cell Biology, and Biochemistry

- Project: Effects of Hallmark Cancer Mutations on Ovarian Cancer Metabolism
Expected Graduation: 2028
8. Kruti Savani, ScM student
Department: Biomedical Engineering
Project: Exosome Interactions Drive Epithelial Ovarian Cancer Progression
Expected Graduation: 2026
 9. Mingzhen Zhou, ScM student
Department: Biomedical Engineering
Project: Exosome Interactions Drive Epithelial Ovarian Cancer Progression
Expected Graduation: 2026
 10. Jacqueline Quinones, 5th Year Master's Student
Department: Biophysics
Project: Tumor Microenvironment Interactions
Expected Graduation: 2024
 11. Yanxi Li, ScM student
Department: Biotechnology
Project: Murine Polyploid Giant Cancer Cell Morphology and Metabolism.
Expected Graduation: 2024
 12. Crystal Vargas, ScM student
Department: Biotechnology
Project: Senescence Associated Secretory Phenotype and Breast Cancer PGCCs.
ScM Student - 2023 graduate
Current Position: Pfizer Internship
 13. Difei Xu, ScM student
Department: Biotechnology
Project: Metabolic and Treatment Stress Effects on Ovarian Cancer Paclitaxel Resistance
ScM Student - 2023 graduate
Current Position: R&D, Machine Learning Company
 14. Braxton Morrison, ScM student
Department: Biomedical Engineering
Project: Epithelial Ovarian Cancer Progression via Exosome Transfer from PGCCs
ScM Student - 2022 graduate
Current Position – Pfizer Internship while Applying to Medical School
 15. Devin Schroeder, ScM student
Department: Biotechnology
Project: Epithelial Ovarian Cancer Progression Mediated through Exosome Transfer
ScM student - 2021 graduate
Current Position – Industry / Unknown
 16. Mateo Frare, ScM student
Department: Biomedical Engineering
Project: Tissue Derived Soluble Factors Direct Metaplastic Breast Cancer
ScM student - 2021 graduate

Current Position – R&D, MatTek

17. Zhan Wu, ScM student

Department: Biomedical Engineering

Project: Using Single Cell Biophysics to Predict Breast Cancer Drug Response

ScM student - 2019 graduate

Current Position - PhD program in UK

❖ **Rotation Students**

1. James He, MD-PhD rotation
Department: MCB (Fall 2024)
Project: DNA Damage in Irradiated PCLS
2. Michelle Shub, PhD rotation
Department: MCB (Spring 2024)
Project: Breast Cancer Metastasis in PCLS
3. Breanna Demistichas, PhD rotation
Department: MCB (Fall 2023)
Project: Ovarian Cancer PGGC Lipid Metabolism
4. Shade Rodriguez, PhD rotation
Department: Pathobiology (Summer, Fall 2022)
Project: Inflammatory Ovarian Cancer Tumor Microenvironment
5. Andrew Nunez, PhD rotation
Department: MCB (Spring 2022)
Project: BRCA1 Expression in Breast Cancer Polyploid Giant Cancer Cells
6. Dominique Pablito, PhD rotation
Department: MCB (Summer 2021)
Project: Isolation of Polyploid Giant Cancer Cells in Ovarian Cancer
7. Sorel Ouonkap Yimga, PhD rotation
Department: MCB (Spring 2020)
Project: Biophysics of Polyploid Giant Cancer Cells in Ovarian Cancer
8. Jiwon Seo, PhD rotation
Department: MCB (Fall 2019)
Project: Using Biophysical Models to Understand Chemoresistant Ovarian Cancer
9. Blessing Akobundu, PhD rotation
Department: Molecular Pharmacology, Physiology, and Biotechnology (Fall 2018)
Project: Stromal Cell Interactions in Radiation Resistant Prostate Cancer
10. Chyna Gray, PhD rotation
Department: MCB (Spring 2018)
Project: Cancer Treatment Resistance and Elements of the Tumor Microenvironment

❖ **Undergraduate Students**

1. Madeline Chong, Biochemistry and Molecular Biology.
2. Phillip Park, Biochemistry and Molecular Biology.
3. Isabell Thissell, Biochemistry and Molecular Biology (2024 UTRA).

4. Lisa Miyazaki, Biochemistry and Molecular Biology (2024 UTRA).
5. Noah Bingham. Biomedical Engineering, Expected Graduation May 2024. Undergraduate thesis: Understanding Mechanical and Chemical Cues in Murine Ovarian Cancer Progression. Current Student.
6. Ivy Koh. Biochemistry and Molecular Biology, Expected Graduation May 2024. Undergraduate thesis: Radiation induced senescence associated secretory phenotype exchange through extracellular vesicles. Received Fall 2022 UTRA for her research. Received Dana Farber/HMS Cancer Research Award for 2023 NESS. Current Student.
7. Nova Dea. Biomedical Engineering, Expected Graduation May 2024. Undergraduate thesis: Extracellular matrix remodeling in pulmonary fibrosis and metastasis. Received Spring 2023 UTRA and Summer REU from NSF for her research. Current Student.
8. Matthew Perricone, Biochemistry and Molecular Biology, Graduated May 2022. Undergraduate thesis: lipid droplet quantification in chemotherapy resistant epithelial ovarian cancer polyploid cells. 2022 Elizabeth Leduc Prize in Cell and Molecular Biology. PhD student at University of Michigan.
9. Braxton Morrison, Computational Studies, Graduated May 2022. Undergraduate thesis: Exosome transfer of microRNAs triggers biophysical alterations in invasive epithelial ovarian cancer cells. Completed Master's Program, Currently at Pfizer.
10. Allison Lin, Biochemistry and Molecular Biology, Graduated May 2021. Undergraduate thesis: Lipid droplet metabolism alters chemotherapy response in epithelial ovarian cancer. Completed Postbac, Currently in Medical School at Columbia University.
11. Rachele Shao, Biochemistry and Molecular Biology, Graduated May 2021. Currently she is Research Intern at Pennell Chemical & Environmental Engineering Lab, Brown.
12. Andrew Kopplin, Biochemistry and Molecular Biology, Graduated May 2021.
13. Devin Schroeder, Biochemistry and Molecular Biology, Graduated May 2020. Graduated in 2020 and stayed for 1-year biotechnology master's program. Thesis: Role of hsa-mir-200b in ovarian cancer cell proliferation and migration. Currently working as a Tutor and looking for position in industry.
14. Emily Cheney, Biology: Physiology and Biotechnology Track, Graduated May 2019. Undergraduate thesis: Establishing markers for cellular senescence in irradiated lung fibroblasts. Completed postbac at Dana-Farber Cancer Institute. Currently in Medical School, Mount Sinai.
15. Kylen Soriano, Health and Human Biology (Pre-Med), Graduated May 2019. Undergraduate thesis: TGF- β 1 and hypoxia induced epithelial-mesenchymal transition effects on ovarian cancer mechanosensitivity. Completed postbac at Mount Sinai. Currently in Medical School at UCSF.
16. Elizabeth Clifton, Applied Mathematics and Biology, Graduated May 2019. Undergraduate thesis: PGCCs and their role in aging and chemotherapeutic resistance. Worked as an EMT. Currently in Medical School at Mount Sinai.
17. Jeffrey Hsu, Biochemistry, Graduated May 2019. Undergraduate thesis: Mesenchymal stem cell-secreted TGF- β 1 facilitates EMT in ovarian cancer progression through

cytoskeletal and nuclear reorganization. Completed postbac at Broad Institute. Currently in the MD-PhD program at the University of Virginia School of Medicine.

18. Thomas Skipper, Biomedical Engineering, Graduated May 2019. Undergraduate thesis: Modeling ovarian cancer microenvironments using alginate-gelatin microspheres. Completed postbac at Broad Institute before. Currently in MD-PhD program at Geisel School of Medicine at Dartmouth.
19. Joy Jiang, Biochemistry and Molecular Biology, Graduated May 2019. Undergraduate thesis: Differences in cytoskeletal biophysics to explain heterogeneity in polyploid giant breast cancer cell populations. Completed Stanford University for Cancer Research Education and Summer Training Program (CREST). Currently in Medical School at Mount Sinai.
20. Oksana Goretaya, Chemical Biology, Graduated May 2017. Currently an EMT in KY.

❖ **Postdocs**

1. Carolina Mejia Pena, Postdoctoral research assistant (2022-current), Project: role of lipid metabolism in ovarian cancer progression.
2. Deepraj Ghosh, Postdoctoral research assistant (2017-2021), Project: tumor microenvironment interactions forcing cancer progression - stromal cell aging and breast cancer progression. Promoted to Research Assistant Professor – January 2021. Currently Research Assistant Professor in MCB - working with my lab.
3. Nhat Quach, BR RTP postdoctoral fellow (2018-2021), Project: elucidating the role of cytosolic phospholipase A2 in preparing the niche for lung cancer development. Currently working in R&D at Merck.

❖ **Other mentees**

1. Synphane Gibbs, 2019 Leadership Alliance Summer Undergraduate Student, Currently PhD Student at University of Virginia.
2. Santiago Acero Bedoya, 2018 Leadership Alliance Summer Undergraduate Student, Currently PhD Student at University of Chicago.

STUDENTS MENTORED AT GEORGIA TECH (GT)

❖ **GT Graduate Students (5)**

1. Deepraj Ghosh – PhD in Chemical and Biomolecular Engineering
Thesis title: Therapeutic Effect of Soluble Factor Mediated Mechanical Response of Mesenchymal Stem Cells. Defended: June 25, 2014 and stayed on as Postdoc until 2016.
Current Position: Research Assistant Professor, Brown University
2. Kathleen McAndrews – PhD in Chemical and Biomolecular Engineering
Thesis title: Molecular and Mechanical Regulators of the Tumor Microenvironment and Mesenchymal Stem Cell Induced Cancer Progression. Defended: June 25, 2015.
Current Position: Lecturer, MD Anderson Cancer Center
3. Daniel McGrail – BS, MS, PhD in Chemical and Biomolecular Engineering

Thesis title: Development of a High Throughput Mechanomic Screening Approach for Targeting Metastatic Ovarian Cancer. Defended: June 20, 2015.

Current Position: Assistant Staff, Cleveland Clinic, Lerner Research Institute

4. Kevin Rodriguez – MS, Currently, Sales Account Manager at Bühler Group
5. Russell Jampol – MS, Currently, Process Development Senior Associate Scientist at Amgen

❖ **GT Undergraduate Students (43)**

Ryan Amos, Jake Childs, Daniel McGrail, Lauren Sanders, Divine Edem, Sarah McNew, David Boney, Clint Cheng, Eric Lin, Tanisha Bilups, Michelle Park, Christine Hang, Hasan Khosravi, Jae Shin, Virginia Lin, Harshel Desai, Charles Kuo, Xuan Vuong, Christine Muzzelo, Chinelo Ononye, Joe Roesner, Hweeyee Han, Mark Qi, Cecilia Pantoja, Barbara Zappala, Brandon Ling, Derrick Morton, Nhat Quach, Eled Gebrihot, Min Jeong Kim, Jason Iandoli, Vinh Trang, Tuyet Lam, Niti Khambhati, Jaeyoon Yi, Quang Minh Kieu, Krishan Patel, Chandler Brandenburg, Nithin Ravikumar, Blake Lash, Christian Burns, Robert Cowles, Dalton Snyder.

❖ **GT Postdocs and Visiting Scholars (4)**

Adrian Katona, Dustin Zuelke, Deepraj Ghosh, Shabnam Gupta.

❖ **GT High School Student Interns (4)**

Brett Jones, Kathleen Allen, Ronald Shanderson, Saachi Datta.

OTHER TEACHING ACTIVITIES

❖ **PhD/ScM Thesis Committees, Brown University**

1. Diana F Faustino, PhD Candidate, Pathology & Lab Medicine, Advisor – Sendurai Mani
2. Breanna Demistichas, PhD Candidate, MCB, Advisor – Sendurai Mani
3. Joanna Madella, PhD Candidate, MCB, Advisor – Sendurai Mani
4. Audrey Dalgarno, PhD Candidate, MCB, Advisor – Nicola Neretti
5. Jennifer Cui, PhD Candidate, MCB, Advisor – George Lisi
6. Ryan Dubay, PhD Candidate, Biomedical Engineering – Eric Darling
7. Kristen Fregoso, PhD Candidate, Molecular Pharmacology and Physiology – Nikos Tapinos
8. Zahra Ahmed, PhD Candidate, Biomedical Engineering, Advisor – Vikas Srivastava
9. Anna Rusnak, ScM Candidate, Biomedical Engineering, Advisor - Anubhav Tripathi
10. Adriana Col De Pena, PhD Candidate, Biomedical Engineering, Advisor - Anubhav Tripathi
11. Ashley Uruchurtu, PhD Candidate, Pathology & Lab Medicine, Advisor – Wafik El-Deiry
12. Verida Leandre, PhD student, Biomedical Engineering, Advisor – Edith Mathiowitz
13. Sarah Gordon, PhD Candidate, MCB, Advisor – Shipra Vaishnava
14. Chinedu Irofuala, ScM Candidate, Biomedical Engineering, Advisor – Karen Coulombe
15. Elizabeth Bixler, ScM Candidate, Biomedical Engineering, Advisor – Eric Darling

16. Megan Dempsey, PhD Candidate, Biomedical Engineering, Advisor – Eric Darling
17. Jiwon, Seo, PhD Candidate, MCB, Advisor – John Sedivy
18. Hafithe Al Ghosain, ScM Candidate, Biomedical Engineering, Advisor – Jonghwan Lee
19. Adrienne Parsons, PhD, ScM Candidate, Biomedical Engineering, Advisor – Eric Darling
20. Shuai Zhao, PhD Candidate, Pathobiology, Advisor - Wafik El-Deiry
21. Aakash Jhaveri, ScM Candidate, Pathobiology, Advisor - Wafik El-Deiry

❖ **Science, Engineering and Education Workshops**

1. Nabrit Conference for Early Career Scholars / SACNAS Regional Meeting, 2022
2. Harvard CNS Scholars Training Program, Boston, MA 2020.
3. NRMN SETH Grant Coaching Workshop, Bethesda, MD 2019.
4. Harvard Minority Faculty Development Workshop, Boston, MA 2019.
5. Harvard Med School: Career Advancement and Leadership Skills for Women in Healthcare, Boston, 2018.
6. NSF EFRI Workshop, Convergence and Interdisciplinarity in Advancing Larger Scale Research, DC, 2018.
7. Graduate Student Orientation, Focusing Professional Activities to Build a Strong CV, Brown, 2017.
8. NSF Includes Broadening Participation in STEM Conference, San Diego, CA, 2016.
9. NSF BRIGE Principal Investigator Conference, Washington, DC, 2011.
10. NSF Career Development Workshop, University of Florida, 2009.
11. College of Engineering, Pennsylvania State University, 2004.

SERVICE

SERVICE TO BROWN UNIVERSITY

Leadership Roles

- ❖ Co-Director of Graduate Studies, Biomedical Engineering Program and I-BEAM
- ❖ Associate Director for Cancer Research, Training, and Education Coordination (CRTEC) and Co-Director of the Translational Research Disease Group for Gynecological Cancers, Legorreta Cancer Center

Programs and Department Affiliations

- ❖ Trainer in MCB, Therapeutics (formally MPPB), Pathobiology, Biomedical Engineering, Biotechnology, and Brown Respiratory Research Training Programs.
- ❖ Faculty Member in Center on the Biology of Aging and Legorreta Cancer Center.
- ❖ Member of the Breast Cancer Translational Research and Gynecological Cancer Translational Research Disease Groups.
- ❖ Member of the Stem Jazz Program for building diverse collaborations in STEM.

Faculty Advising for Human Health and Biology and Sophomores at Brown

- ❖ Afife, Samiyra (Human Health and Biology)
- ❖ Afsharian, Parisa (Human Health and Biology)
- ❖ Bai, Alice (Human Health and Biology)
- ❖ Egu, Keren (Human Health and Biology)
- ❖ Hamze, Jad (Human Health and Biology)
- ❖ Hunter, Jared (Human Health and Biology)
- ❖ Singh, Simran (Human Health and Biology)
- ❖ Steinbaum, Alyssa (Human Health and Biology)
- ❖ Brandao, Marina (Sophomore)
- ❖ Brault, Ellie (Sophomore)
- ❖ Kalakish, Yasmina (Sophomore)
- ❖ Kelii, Kawehi (Sophomore)
- ❖ Von Redden, Victoria (Sophomore)

Committee and Training Grant Related Work:

- ❖ MPP Executive Board member (2020-present)
- ❖ MPP DIAP Committee member and chair (2019-2020)
- ❖ MCB Faculty Retreat Chair (2018, 2023)
- ❖ MCB Faculty Retreat Co-Chair (2017, 2022)
- ❖ MCB Graduate Recruitment Committee (2017, 2021-present)
- ❖ MCB Seminar Committee (2021-present)
- ❖ MPP Seminar Committee (2017-2021)
- ❖ MCB DIAP Committee (2017-2018, 2021-present)
- ❖ Trainer on T32 Grants for the Biology of Aging, MPPB/Therapeutics, Brown Respiratory Research Training Program, and MCB

Advisory Roles:

- ❖ Office of Women in Medicine and Science Advisory Board Member (2018-2024)
- ❖ Samuel Nabrit Early Career Conference Planning Committee (2021-2023)
- ❖ IMSD Internal Advisory Board Member (2019-2022)

SERVICE TO THE PROFESSION

Scientific Grant Review:

- ❖ Standing Member of the Cancer Cell Biology Study Section (CCB), Oncology 1-Basic Translational Integrated Review Group (OBT) (2023-present)
- ❖ Ad hoc Reviewer for Cancer Cell Biology (CCB) (2022) and Basic Mechanisms of Cancer Health Disparity (BMCD) (2022) study sections of the National Institutes of Health
- ❖ Panel reviewer for the National Science Foundation
- ❖ Scientific Reviewer for the Department of Defense Cancer Research Programs in breast and ovarian cancer (BCRP, OCRP) and Research Program on Wound Healing
- ❖ Scientific Reviewer of the Ford Foundation Fellowships (Biomedical Sciences)

Manuscript Review:

Annals of Biomedical Engineering, ACS Biomaterials, Advanced Science, Aging, Aging Cell, Biomaterials, Biophysical Journal, BMC Cancer, Cancer Cell, Cancer Research, Cancers/MDPI Journals, Cell, Cell Communication and Signaling, Cell Reports, Communications Biology, Cytoskeleton, eLIFE, EMBO, Frontiers journals, Journal of Clinical and Experimental Metastasis, J Royal Society Interface, iScience, Nature Communications, Nature Methods, Oncogene, Pathology Reports, Plos One, PNAS, Science Advances, Stem Cells, Stem Cells and Development.

Editorial Boards:

- ❖ Cancers, Editorial Board Member / Section Editor (2022-present).
- ❖ Scientific Reports, Editorial Board Member (2017-present).
- ❖ Plos One, Section Editor (2018-present).
- ❖ Frontiers in Developmental Biology, Associate Editor (2022-present).

National and International Conference/Societies:

- ❖ New England Science Symposium
- ❖ Gordon Research Conference: Physics of Cancer
- ❖ American Association for Cancer Research
- ❖ American Society for Cell Biology
- ❖ Experimental Cell Biology
- ❖ American Society for Extracellular Vesicles
- ❖ American Institute of Chemical Engineers
- ❖ Biomedical Engineering Society
- ❖ Society of Engineering Science
- ❖ Radiological Society of North America

Workshops:

- ❖ NCI Division of Cancer Biology New Grantee Workshop, 2023
- ❖ NCI Awardee Skills Development Workshop: Immuno-Oncology, 2023
- ❖ NCI Awardee Skills Development Workshop: UPENN-CHOP Cell & Gene Delivery, 2023
- ❖ RCMI Conference, NRMN SETH Alumni Panel, 2023
- ❖ NRMN SETH Grant Writing Workgroup, 2020
- ❖ Harvard CNS Scholars Training Program, 2020.
- ❖ NRMN SETH Grant Coaching Workshop, 2019.
- ❖ Harvard Minority Faculty Development Workshop, 2019.
- ❖ Harvard Medical School: Career Advancement and Leadership for Women, 2018.

SERVICE TO THE COMMUNITY**K12 Outreach Activities**

- ❖ Teaching a 1-week course in Brown's Pre-College Program. Applied Cell and Molecular Biology Summer@Brown Course, July 15-19, 2024.

- ❖ Lecture: Presented research to 30 advanced 12th grade science students from science cooperative in upstate New York through Questar III New Visions Medical Program. Title: "Biophysics and Medicine." Follow-up activities were shared with the teachers.
- ❖ Mentoring High School Students: I met with and advised multiple high school students about biomedical research and allowed them to audit my course (BIOL 1810) and visit or do research in my lab.
- ❖ Development of Hands-On Research Modules: I developed hands on activities for teaching cytoskeletal mechanics to non-science majors and K12 students and shared these with teachers and students through Brown Science Program.

Broadening Participation in STEM: Workshops, Advisory Boards, and Meetings

- ❖ National Science Foundation BIO/MCB Workshop and Conference: I was invited to this workshop and conference in New Hampshire and asked to present in a panel of faculty members that had been successful in obtaining NSF funding.
- ❖ Participation in Continuing Medical Education: I presented a general breast cancer research talk in Rhode Island Women's Health Summit.
- ❖ Samuel Nabrit Conference for Early Career Scholars: I have moderated sessions, hosted visitors, and worked on the planning committee for several years.
- ❖ Presented Work to Senators and Public Officials: I presented ideas about cancer research to senators and legislators at the American Cancer Society Breakfast.
- ❖ Mentored URM Students: I serve as research mentor for Leadership Alliance students.
- ❖ Faculty Advisory Board for Louisiana Tech University's Biomedical Engineering Program: I served on this advisory board for more than 10 years.
- ❖ NSF EFRI Workshop on Convergence & Interdisciplinarity in Advancing Larger Scale Research: I attended workshop focused on large collaborative NSF projects.
- ❖ NSF Includes Broadening Participation in STEM Conference: I attended this workshop focused on forming partnerships with junior colleges and high schools to create larger outreach plans that more effectively broaden participation in STEM.

Website and Social Media

- ❖ Website: I developed an external lab website, www.dawsoncellbiophysics.com, to showcase experimental approaches, research areas and project directions, and achievements being made in my research lab. The new website has garnered more traffic than the original website on Brown Sites. The new website is also easier to update and expand to reach multiple audiences.
- ❖ Social Media: I have established lab Facebook and Instagram pages and Twitter accounts to share lab achievement and ideas with a broader audience.
- ❖ File Sharing: I have shared MATLAB code, analysis pipelines, and published data through multiple file sharing servers and direct requests.
- ❖ Scientific Press: I have worked with local press to ensure that our scientific achievements are communicated to a general audience through University Press and Online Research News.

ACTIVITIES HIGHLIGHTING FOCUS ON DIVERSITY, EQUITY, AND INCLUSION

DEI-Related Grant Review

- ❖ Scientific Reviewer of the Ford Foundation Fellowships (Biomedical Sciences)
- ❖ Ad-hoc Reviewer for Basic Mechanisms of Cancer Health Disparity (BMCD)

DEI-Related Workshops and Conferences

- ❖ Samuel Nabrit Conference for Early Career Scholars
- ❖ Conference of the Ford Fellows
- ❖ RCMI Consortium National Conference
- ❖ NRMN SETH Grant Coaching Workshop
- ❖ Harvard Minority Faculty Development Workshop
- ❖ Harvard Medical School: Career Advancement and Leadership Skills for Women in Healthcare Conference
- ❖ NSF EFRI Workshop on Convergence & Interdisciplinarity in Advancing Research
- ❖ NSF Includes Broadening Participation in STEM Conference

DIAP Committees:

- ❖ MPP DIAP Committee member and chair
- ❖ MCB DIAP Committee

DEI-Related Advisory Roles:

- ❖ Office of Women in Medicine and Science Advisory Board Member
- ❖ Samuel Nabrit Early Career Conference Planning Committee
- ❖ IMSD Internal Advisory Board Member