Kolade (Omokolade) Adebowale

NIH NIGMS MOSAIC K99/R00 Post-doctoral Fellow
Harvard University
John A. Paulson School of Engineering and Applied Sciences
150 Western Ave
Allston, MA 02134
Phone: 773-759-3342
Email: kaa@seas.harvard.edu

POSITIONS

NIH NIGMS MOSAIC K99/R00 Post-doctoral Fellow	**August 2023-Date**
NSF MPS-Ascend Post-doctoral Fellow	**September 2021-July 2023**
NIH F31 Pre-doctoral Fellow (Diversity)	**March 2020-June 2021**
NSF GRFP Fellow / Stanford Graduate Fellow (combined)	**September 2015-March 2020**

EDUCATION

Stanford University, Palo Alto CA **September 2015-June 2021**
Doctor of Philosophy (PhD) in Chemical Engineering (GPA: 3.83/4.00)
Primary Advisor: Prof. Ovijit Chaudhuri
Dissertation committee: Prof. Chaitan Khosla, Prof. Alexander Dunn, Prof. Marc Levenston, Prof. Paul Bollyky, and Prof. Ovijit Chaudhuri

Columbia University in the City of New York, NY **September 2013-February 2015**
Master of Science (MSc) in Chemical Engineering (GPA: 3.86/4.00)

Illinois Institute of Technology (IIT), Chicago IL **September 2007-May 2011**
Bachelor of Science (BSc) in Chemical Engineering (GPA: 4.00/4.00)

POSITIONS, FELLOWSHIPS, AWARDS, AND HONORS

Positions and Employment

2023	NIH NIGMS MOSAIC K99/R00 Postdoctoral Scholar
2021-2023	NSF MPS-Ascend Postdoctoral Fellowship
2021-Date	Postdoctoral fellow, Harvard University, Cambridge, MA
2015-2021	Graduate Student Research Assistant, Stanford University, Stanford, CA
2015-2015	Undergraduate Student Researcher, Illinois Institute of Technology, Chicago, IL Intern, Novartis Institute of Biomedical Research, Cambridge MA
2008-2008	Summer Research Experience for Undergraduates, IIT, Chicago, IL

Fellowships

2023	NIH NIGMS MOSAIC K99/R00
2021-2023	NSF MPS-Ascend Postdoctoral Fellowship
2020	National Institutes of Health F31 (Diversity)
2015	Stanford Graduate Fellowship
2015	Stanford Diversity Fellow
2014	National Science Foundation Graduate Research Fellowship Program

Teaching Award

2018 Stanford biochemical engineering TA teaching award

Honors

2019 Stanford chemical engineering graduate student colloquium speaker
2018 Gordon Research Conference Poster winner
2011 Undergraduate commencement speaker
2011 Neal L. Hospers outstanding undergraduate award
2007-2011 Dean's List (GPA > 3.85, on a 4.00 scale)

PERSONAL STATEMENT

I am fascinated by how to decode the complexity of the immune system. For example, a T cell must solve the problem of contacting extremely rare antigen-bearing cells. This is a formidable task because a single T cell occupies only one one-hundred-trillionth of the volume of the adult human. Ex vivo models can be used to engineer synthetic immune niches for fundamental insights. I have trained in developing biomaterials, mechanobiology, and therapeutic immune cell engineering.

As an undergraduate at the Illinois Institute of Technology, I made functionalized PEG biomaterials. I further honed these skills as a graduate student at Stanford in Professor Ovijit Chaudhuri's lab. During graduate school, I broadened my biomaterials development skills and expanded my scientific knowledge by learning about 3D cell culture, cellular mechanotransduction, and the biophysics of cell migration. During this time, I developed and characterized the mechanical properties of alginate-matrigel viscoelastic biomaterials and performed cell migration analyses. My experience in this area resulted in one second-author publication in 2018 and a first-author publication that was published in 2021. Further, I developed a new viscoelastic alginate-collagen material that mimics the stromal matrix. I was able to develop a strategy to independently tune the mechanical properties of the alginate-collagen biomaterial (stiffness, stress relaxation, collagen fiber length).

Interdisciplinary research has become a key tenet of my scientific outlook. During my graduate studies, I was engaged in collaboration with colleagues within the Chaudhuri lab and across Stanford's campus. These collaborative efforts involved working with materials engineers, computational scientists, cell biologists, immunologists, and gastroenterologists. Our collaborations have resulted in several peer-reviewed publications listed below. I have continued my scientific growth as a postdoctoral fellow in Professor Samir Mitragotri's lab at Harvard. Here, I have developed an assay to study how different macrophage phenotypes traffic to tumors.

Previous efforts have focused on the biochemical cues that regulate the immune system. However, recent studies demonstrate that biophysics and the mechanical properties of tissues play a critical role in regulating the behavior of immune cells. As detailed below, I have been trained in understanding how cells sense and respond to mechanical cues (mechanobiology) and immunology. My training puts me in a unique position to bridge the fields of mechanobiology and immunology (mechanoimmunology) to build a research program that elucidates the mechanisms by which mechanical and biophysical cues regulate the immune system. My research vision is to develop quantitative, predictive models of patient response to cell immunotherapy by leveraging the communication between cellular and mechanical factors in the tumor microenvironment. This interdisciplinary approach holds the potential to transform our understanding and ability to manipulate the immune system.

CONTRIBUTIONS TO SCIENCE

Advisor: Prof. Ovijit Chaudhuri, Stanford University, Stanford, CA (Mechanical Engineering)
1. Extracellular Matrix Viscoelasticity Promotes Liver Cancer Progression in Pre-Cirrhotic NASH.

Type 2 diabetes is a significant risk factor for developing liver cancer (T2DM). T2DM is accompanied by enhanced production of advanced glycation end products (AGES) due to chronically elevated blood glucose levels. AGES accumulate in the liver, altering the mechanical properties of the liver and liver architecture. However, the physiological relevance of these biophysical alterations is not fully understood. This study investigated the role of tissue viscoelasticity and tissue architecture in liver cancer progression. Our results demonstrate, for the first time, that liver viscoelasticity accelerates the progression of liver cancer. Mechanistically, we find that cancer progression occurs through the β1–Tensin 1–YAP mechanotransduction pathway and could be reversed by targeting tissue viscoelasticity and architecture. This study contributes to the growing body of knowledge that the mechanical properties of tissue play an important role in disease progression. In this project, I developed the alginate-collagen, collagen+AGES biomaterial systems that were used to perform the in vitro experiments that provided the basis for the mechanistic insights in the paper. I also quantified the collagen architecture and rheometry experiments. In summary, this study is significant because it demonstrates that tissue viscoelasticity-activated mechano-cellular pathways could be a novel diagnostic indicator and therapeutic target in T2DM-related liver cancer and other cancers associated with T2DM, such as breast cancer, pancreatic cancer, and colon cancer.

Related manuscript publication:

1. Fan W, **Adebowale K**[+], Vancza L[+], Li Y, Rabbi M.R., Vancza L, Kunimoto K, Chen D, Mozes G, Chiu D.K., Engleman E.G., Li Y, Tao J, Wei Y, Adeniji N, Brunsing R.L., Dhanasekaran R, Lo S.H., Hodgson L, Charville G, Charu V, Monga S.P., Kim T.Y., Wells R.G., Chaudhuri O, and Torok N. "Extracellular Matrix Viscoelasticity Drives Liver Cancer Progression in pre-cirrhotic NASH." ***Nature*** *In Press, 2023*. (doi: 10.21203/rs.3.rs-2087090/v1).
   [+] Co-second authors.

Advisor: Prof. Ovijit Chaudhuri, Stanford University, Stanford, CA (Mechanical Engineering)
2. Substrate stress relaxation regulates cancer cell migration.

Much of what we know about the biophysics of cell migration comes from studying how cells migrate on 2D glass substrates. It was previously thought that cells do not migrate on compliant substrates. This raises a conundrum because most biological tissues are compliant. Furthermore, biological tissues are viscoelastic, exhibiting both viscous and elastic characteristics. Viscoelasticity results in a decrease in resistance to an applied deformation over time (stress relaxation). The matrices used were like those described in the previous project. This study focused on elucidating the impact of matrix stress relaxation on the observed mode of cell migration. The canonical mode of 2D cell migration is characterized by spread morphology, broad lamellopodia protrusion, formation of mature focal adhesions, and generation of high traction stresses. However, our findings, utilizing soft, viscoelastic substrates, reveal a mode of migration characterized by round morphology, thin and long filopodia protrusions, weak adhesions, and low traction stresses. This study contributes to cell migration as it demonstrates that matrix stress relaxation contributes to the plasticity of migration displayed by cancer cells. During this project, I was responsible for experimental design, performing experiments, troubleshooting experiments, data analysis, and writing manuscripts.

Related manuscript publications:

1. **Adebowale K**, Gong Z, Hou J.C., Wisdom K.M., Garbett D, Lee H, Nam S, Meyer T, Odde D.J., Shenoy V.B, and Chaudhuri O. "Enhanced substrate stress relaxation promotes filopodia-mediated cell migration." ***Nature Materials***, 2021. (doi: 10.1038/s41563-021-00981-w).
2. Grosskopf A.K., Labanieh L, Klysz D.D., Roth G.A., Xu P, **Adebowale K**, Gale E.C., Jons C.K., Klich J.H., Maikawa C.L., Correa S, Ou B.S., d'Aquino A.I., Cochran J.R., Chaudhuri O, Mackall C.L., and Appel E.A. "Delivery of CAR-T Cells in an injectable stimulatory hydrogel niche improves treatment of solid tumors." ***Science Advances*** 8, 2022. (doi: 10.1126/sciadv.abn8264).
3. Gong Z, Wisdom K.M., McEvoy E, Chang J, **Adebowale K**, Chaudhuri O, Shenoy V.B. "Recursive feedback between matrix dissipation and chemo-mechanical signaling drives oscillatory growth of cancer cell invadopodia." ***Cell Reports***, 35 2021. (doi: 10.1016/j.celrep.2021.109047).
4. Sharma V*, **Adebowale K***, Gong Z*, Chaudhuri O, and Shenoy V.B. "Substrate stress relaxation and glassy adhesion dynamics regulates transition between sub-diffusive and super-diffusive active cell migration." In preparation, 2023.

Advisor: Prof. Ovijit Chaudhuri, Stanford University, Stanford, CA (Mechanical Engineering)

3. Substrate stress relaxation regulates monocyte cell migration.

Monocytes are recruited from the blood to tumors, where they promote or restrain tumor growth. To reach the tumor, monocytes must navigate the tumor stromal matrix, which is viscoelastic. However, the role of matrix viscoelasticity in regulating monocyte migration and phenotype is not known. To address this, I developed an alginate-collagen viscoelastic matrix with fast and slow stress relaxation behavior by changing the molecular weight of the alginate. I then embedded the human monocyte cell line (U937) and primary monocytes in the matrices. Monocytes moved faster in the fast relaxing matrix compared to the slow relaxing matrix. In contrast to previous studies that implicate contractile actomyosin force generation as playing a key role in 3D cell migration, we find that cells migrate without ROCK contractility. Mechanistically, we find that dendritic actin polymerization at the front and linear actin polymerization at the back of the cell generate protrusive forces during migration. In addition, migrating cells open channels in the matrix through which they move. We also found higher expression of pro-inflammatory cytokines IL-16 and IL-1β and the chemokine CCL-4 when cells were embedded in the fast relaxing matrix. These results demonstrate that matrix stress relaxation regulates monocyte recruitment and that cells migrate by pushing the matrix out of the way. More broadly, our findings suggest that tissue viscoelasticity could be diagnostic for tissue inflammatory state and raises the possibility of ECM-targeting to recruit specific immune cell populations.

Related manuscript publications:

1. **Adebowale K**, Ha B, Saraswathibhatla A, Indana D, Popescu M, Demirdjian S, Kamber R, Yang J, Franck C, Bassik M.C., Bollyky P.L., and Chaudhuri O. "Monocytes Use Protrusive Forces to Generate Migration Paths in Viscoelastic Collagen-Based Extracellular Matrices." ***Proceedings of the National Academy of Sciences***. In Revision, 2023. (doi: 10.1101/2023.06.09.544394).

Advisor: Prof. Ovijit Chaudhuri, Stanford University, Stanford, CA (Mechanical Engineering)
4. Matrix mechanical plasticity regulates cancer cell migration in confining microenvironments.

Synthetic and natural matrices are commonly used to elucidate the impact of matrix biophysical cues on cell migration. While many studies focus on how matrix stiffness regulates cell migration, this study focused on matrix mechanical plasticity. Mechanical plasticity refers to the ability of a material to retain deformation after an applied stress has been removed. Several studies indicate that normal and malignant tissues exhibit mechanical plasticity. This project involved the utilization of basement-membrane matrices with tunable stiffness and mechanical plasticity. This study provided evidence that actin-rich invadopodia are force-generating structures that can expand nanoporous matrices of sufficient mechanical plasticity to create micron-size holes for successful migration. Previous studies identified invadopodia as primarily responsible for proteolytic degradation of matrices for cancer migration. However, this study contributed to the field by demonstrating that cells can migrate through nanoporous, confining microenvironments even in the absence of proteolytic activity. On the one hand, this partly explains why protease inhibitors have failed in cancer clinical trials. On the other hand, our findings imply that regulators of invadopodia and force generation can be therapeutically exploited to improve clinical responses. During this project, I discovered that cancer cell encapsulation density was a critical variable for our experimental design. I was also specifically involved in biomaterials development, manuscript writing, and quantification of forces produced during cell migration using traction force microscopy. We extended our studies to investigate how matrix mechanical plasticity modulates monocyte immune cell and stem cell migration.

Related manuscript publications:

1. Wisdom K.M., **Adebowale K**, Chang J, Lee J.Y., Nam S, Desai R, Rossen N.S, Rafat M, West R.B., Hodgson L, and Chaudhuri O. “Matrix mechanical plasticity regulates cancer cell migration through confining microenvironments.” ***Nature Communications*** 9, 2018. (doi: 10.1038/s41467-018-06641-z).
2. Lee H, Alisafaei F, **Adebowale K**, Chang J, Shenoy V.B., and Chaudhuri O. “The nuclear piston activates mechanosensitive ion channels to generate migration paths in confining microenvironments.” ***Science Advances***, 7 2021. (doi:10.1126/sciadv.abd4058).
3. Chang J*, Pang E.M.*, **Adebowale K**, Wisdom K.M., and Chaudhuri O. “Increased Stiffness Inhibits Invadopodia Formation and Cell Migration in 3D.” ***Biophysical Journal*** 119, 2020. (doi: 10.1016/j.bpj.2020.07.003).

Mentor: Prof. Samir Mitragotri, Harvard University, Cambridge, MA (Bioengineering)
5. Dynamics of macrophage tumor trafficking.

The use of adoptive cell therapies (ACTs) is a promising strategy for treating diseases such as cancer and diabetes. Despite their promise, the mechanisms by which ACTs exert their therapeutic functions are not fully understood. Most studies currently focus on providing cytokines to improve the therapeutic response of ACTs. However, ACTs are confronted with a myriad of physical cues, such as tissue viscoelasticity, that regulate their ability to locate the tumor. Macrophages, a phenotypically plastic cell, have been investigated as an ACT. These macrophage cells cover a broad phenotypic spectrum that varies from pro- to anti-inflammatory. What is lacking is a quantitative approach to determine what macrophage type is appropriate to use as an ACT and under what inflammatory condition. To address this, I developed an assay where the trafficking of different macrophage phenotypes under inflammatory conditions can be

quantitatively determined. My confocal time-lapse imaging results revealed that naïve macrophages are much more efficient at trafficking to tumors than those with pro-inflammatory-type phenotype. Furthermore, I implemented machine learning clustering algorithms to reveal that modest shape changes determine efficient macrophage trafficking. These findings demonstrate that the clinically used pro-inflammatory macrophages exhibit poor tumor homing capacity, and their migration ability should be further engineered. During this project, I performed all the experiments and analyses. I also developed the unsupervised machine learning computation approach to identify and quantify morphometric signatures of different macrophage phenotypes in the presence of a breast cancer tumor spheroid.

Related manuscript publication:

1. **Adebowale K**, Guerriero J.L., and Mitragotri S. "Dynamics of Macrophage Tumor Infiltration." ***Applied Physics Reviews*** 10, 2023 (Link).

Link to published work on google scholar:
https://scholar.google.com/citations?user=WSmV0BEAAAAJ&hl=en

PUBLICATION IN PRESS

1. Fan W, **Adebowale K**[+], Vancza L[+], Li Y, Rabbi M.R., Vancza L, Kunimoto K, Chen D, Mozes G, Chiu D.K., Engleman E.G., Li Y, Tao J, Wei Y, Adeniji N, Brunsing R.L., Dhanasekaran R, Lo S.H., Hodgson L, Charville G, Charu V, Monga S.P., Kim T.Y., Wells R.G., Chaudhuri O, and Torok N. "Extracellular Matrix Viscoelasticity Drives Liver Cancer Progression in pre-cirrhotic NASH." ***Nature*** *In Press, 2023*. (doi: 10.21203/rs.3.rs-2087090/v1).
   [+] Co-second authors.

PUBLISHED PEER-REVIEWED PUBLICATIONS

1. **Adebowale K**, Guerriero J.L., and Mitragotri S. "Dynamics of Macrophage Tumor Infiltration." ***Applied Physics Reviews*** 10, 2023 (Link).
   (The research article was selected by the Editors to be a "**Featured Article**" in the journal's upcoming issue.)
2. **Adebowale K***, Liao R*, Chandran V, Kapate N, Lu A, Gao Y, and Mitragotri S. "Materials for Cell Surface Engineering." ***Advanced Materials***, 2023. (Link).
3. Grosskopf A.K., Labanieh L, Klysz D.D., Roth G.A., Xu P, **Adebowale K**, Gale E.C., Jons C.K., Klich J.H., Maikawa C.L., Correa S, Ou B.S., d'Aquino A.I., Cochran J.R., Chaudhuri O, Mackall C.L., and Appel E.A. "Delivery of CAR-T Cells in an Injectable Stimulatory Hydrogel Niche Improves Treatment of Solid Tumors." ***Science Advances*** 8, 2022. (Link).
4. Ikeda-Imafuku M, Gao Y, Shaha S, Wang L.L., Park K.S., Nakajima M, Adebowale O, Mitragotri S. "Extracellular matrix degrading enzyme with stroma-targeting peptides enhance the penetration of liposomes into tumors." ***Journal of Controlled Release*** 352, 2022. (Link).
5. **Adebowale K**, Gong Z, Hou J.C., Wisdom K.M., Garbett D, Lee H, Nam S, Meyer T, Odde D.J., Shenoy V.B, and Chaudhuri O. "Enhanced Substrate Stress Relaxation Promotes Filopodia-Mediated Cell Migration." ***Nature Materials*** 20, 2021. (Link).
   (**Stanford News**: Stanford Study reveals a unique mode of cell migration on soft 'viscoelastic' surfaces.)
6. Lee H, Alisafaei F, **Adebowale K**, Chang J, Shenoy V.B., Chaudhuri O. "The Nuclear Piston Activates Mechanosensitive Ion Channels to Generate Migration Paths in Confining Microenvironments." ***Science Advances*** 7, 2021. (Link).

7. Gong Z, Wisdom K.M., McEvoy E, Chang J, **Adebowale K**, Price C.C., Chaudhuri O, Shenoy V.B. "Recursive Feedback Between Matrix Dissipation and Chemo-Mechanical Signaling Drives Oscillatory Growth of Cancer Cell Invadopodia." ***Cell Reports*** 35, 2021. (Link).
8. Chang J*, Pang E.M.*, **Adebowale K**, Wisdom K.M., and Chaudhuri O. "Increased Stiffness Inhibits Invadopodia Formation and Cell Migration in 3D." ***Biophysical Journal*** 119, 2020. (Link).
9. Wisdom K.M., **Adebowale K**, Chang J, Lee J.Y., Nam S, Desai R, Rossen N.S, Rafat M, West R.B., Hodgson L and Chaudhuri O. "Matrix Mechanical Plasticity Regulates Cancer Cell Migration Through Confining Microenvironments." ***Nature Communications*** 9, 2018. (Link).

* Equal contribution.

PUBLICATION UNDER REVISION

1. **Adebowale K**, Ha B, Saraswathibhatla A, Indana D, Popescu M, Demirdjian S, Kamber R, Yang J, Franck C, Bassik M.C., Bollyky P.L., and Chaudhuri O. "Monocytes Use Protrusive Forces to Generate Migration Paths in Viscoelastic Collagen-Based Extracellular Matrices." ***Proceedings of the National Academy of Sciences***. In Revision, 2023. (Link).

PUBLICATION UNDER REVIEW

1. Kapate N, Liao R, Sodemann L, Stinson T, Prakash S, Kumbhojkar N, Suja V.C., Wang L.L., Flanz M, Rajeev R, Villafuerte D, Shaha S, Janes M, Park K.S., Dunne M, Golemb B, Hone A, **Adebowale K**, Clegg J, Slate A, McGuone D, Bartell B, Mitragotri S. "Backpack-Mediated Anti-Inflammatory Macrophage Cell Therapy for The Treatment of Traumatic Brain Injury." (Submitted to ***Science Advances*** September 1, 2023).

PUBLICATION IN PREPARATION

1. Sharma V*, **Adebowale K***, Gong Z*, Chaudhuri O, and Shenoy V.B. "Substrate stress relaxation and glassy adhesion dynamics regulates transition between sub-diffusive and super-diffusive active cell migration."
   * Co-authors.

SELECTED INVITED TALKS

1. **Adebowale K**. "Ushering in The Era of Quantitative, Predictive, Immune Cell-Based Therapies for Impact." Rice University Future Leaders in Bioengineering Symposium (2024).
2. **Adebowale K**, Ha B, Saraswathibhatla A, Indana D, Popescu M, Demirdjian S, Kamber R, Yang J, Franck C, Bassik M.C., Bollyky P.L., and Chaudhuri O. "Monocytes Use Protrusive Forces to Generate Migration Paths in Viscoelastic Collagen-Based Extracellular Matrices." University of Utah Rising Post-Doctoral Rising Stars Symposium (2023).
3. **Adebowale K**, Guerriero J.L., and Mitragotri S. "Dynamics of Macrophage Tumor Infiltration." Gordon Research Conference Physical Science of Cancer (2023).
4. **Adebowale K**, Guerriero J.L., and Mitragotri S. "Dynamics of Macrophage Tumor Infiltration." BME UNITE Future Faculty Seminar Series (2023).
5. **Adebowale K**, and Mitragotri S. "Elucidating Biophysical and Biochemical Cues Shaping Migration of Monocytes and Macrophages." Harvard Medical School Department of Systems Biology (2023).

6. **Adebowale K**, Gong Z, Hou J.C., Wisdom K.M., Garbett D, Lee H, Nam S, Meyer T, Odde D.J., Shenoy V.B, and Chaudhuri O. "Enhanced Substrate Stress Relaxation Promotes Filopodia-Mediated Cell Migration." Engineering and Applied Science Forum Webinar Series (2022).
7. **Adebowale K**, Gong Z, Hou J.C., Wisdom K.M., Garbett D, Lee H, Nam S, Meyer T, Odde D.J., Shenoy V.B, and Chaudhuri O. "Enhanced Substrate Stress Relaxation Promotes Filopodia-Mediated Cell Migration." Center for Engineering Mechanobiology Future Leaders in Mechanobiology Seminar (2021).
8. **Adebowale K**, Gong Z, Hou J.C., Wisdom K.M., Garbett D, Lee H, Nam S, Meyer T, Odde D.J., Shenoy V.B, and Chaudhuri O. "Enhanced Substrate Stress Relaxation Promotes Filopodia-Mediated Cell Migration." Society for Biomaterials Diversity, Equity and Inclusion Rising Star Speaker (2021).
9. **Adebowale K**, Gong Z, Hou J.C., Wisdom K.M., Garbett D, Lee H, Nam S, Meyer T, Odde D.J., Shenoy V.B, and Chaudhuri O. "Enhanced Substrate Stress Relaxation Promotes Filopodia-Mediated Cell Migration." Soft Matter for All symposium (2020).

PROPOSAL WRITING EXPERIENCES (FUNDED)

1. **($996,934** for five years. Role: PI) - NIH NIGMS MOSAIC K99/R00: Elucidating Biophysical Cues Shaping Immunity, 2023.
2. **($300,000** for three years. Role: PI) - NSF MPS-Ascend: Cellular Backpacks: A Fundamental Investigation of Cell-Material Interactions, 2021.
3. **(~$89,000** for two years. Role: PI) - NIH F31: Role of Matrix Viscoelasticity on Tumor-Macrophage Interactions, 2019.
4. **(~$126,000** for three years. Role: Graduate Student) – NSF GRFP: Computer Simulations to Illuminate Mechanisms of Membrane Fusion in Living Cells, 2014.

PROPOSAL WRITING EXPERIENCES (UNFUNDED)

1. **($15,000** for six months. Role: PI) – Society for Industrial and Applied Mathematics: Integrating Agent-Based Model Simulations and Quantitative Experiments to Elucidate the Role of Macrophage Heterogeneity in Tumor Evolution, 2023.

MEDIA COVERAGE

1. The research manuscript was selected as a "Featured Article" by the Applied Physics Reviews journal and will be heavily advertised online (2023).
2. Harvard News: Participation in High-School Summer Outreach Program (2023).
3. Stanford News: Stanford Study Reveals a Unique Mode of Cell Migration on Soft 'Viscoelastic' Surfaces (2021).
4. Recipient of Stanford's Justice, Equity, Diversity, and Inclusion Award (2021).
5. Worked as a volunteer on a special issue of Chemical and Engineering News as part of black history month to recognize black scientist trailblazers. Guest Editor: Professor Paula Hammond, MIT (2021).

SELECTED FELLOWSHIPS AND FUNDING

1. NIH NIGMS MOSAIC K99/R00 **August 2023-August 2028**
2. NSF MPS-Ascend Post-doctoral Fellowship **September 2021-July 2023**
   (Declined 3rd year of funding)
3. National Institutes of Health F31 (Diversity) **March 2020-June 2021**
   (Declined 2nd year of funding)

SELECTED AWARDS AND HONORS

1. Stanford Justice, Equity, Diversity, and Inclusion award **July 2021**
2. Stanford Chemical Engineering Student Colloquium Speaker **April 2019**
3. STEEM Gordon Research Conference Poster Winner **July 2018**

SELECTED CONFERENCE AND SYMPOSIUM TALKS

1. **Adebowale K**, Ha B, Saraswathibhatla A, Indana D, Popescu M, Demirdjian S, Kamber R, Yang J, Franck C, Bassik M.C., Bollyky P.L., and Chaudhuri O. "Monocytes Use Protrusive Forces to Generate Migration Paths in Viscoelastic Collagen-Based Extracellular Matrices." The talk will be presented at the 2023 annual conference of the American Institute of Chemical Engineers (2023).
2. **Adebowale K**, Ha B, Saraswathibhatla A, Indana D, Popescu M, Demirdjian S, Kamber R, Yang J, Franck C, Bassik M.C., Bollyky P.L., and Chaudhuri O. "Monocytes Use Protrusive Forces to Generate Migration Paths in Viscoelastic Collagen-Based Extracellular Matrices." The talk will be presented at the 2023 annual conference of the Biomedical Engineering Society (2023).
3. **Adebowale K**, Mitragotri S, and Chaudhuri O. "Elucidating Biophysical Cues Shaping Immunity." Talk presented at the Physical Science of Cancer Gordon Research Conference (2023).
4. **Adebowale K**, Gong Z, Hou J.C., Wisdom K.M., Garbett D, Lee H, Nam S, Meyer T, Odde D.J., Shenoy V.B, and Chaudhuri O. "Enhanced Substrate Stress Relaxation Promotes Filopodia-Mediated Cell Migration." Talk presented at the National Chemical Engineering Future Faculty Seminar Series (2020).

SELECTED TEACHING AWARD AND TEACHING EXPERIENCES

TA Teaching Award (Biochemical Engineering at Stanford). **January 2018**
- One among 29 TAs recognized across the university.

Biochemical Engineering Teaching Assistant (TA). **January 2017-April 2017**
Transport Phenomena I TA. **September 2013-December 2013**

SELECTED MENTORING TO PROMOTE DIVERSITY, EQUITY, AND INCLUSION

Harvard University:

1. Ana Marie Perea - research intern at Memorial Sloan Kettering (2022-date).
2. Shrinivas Acharya - graduate student in bioengineering (2022-date).
3. Suyog Shaha - graduate student in bioengineering (2022-date).
4. Supriya Prakash - graduate student in bioengineering (2022-date).
5. Maithili Joshi - graduate student in bioengineering (2022-date).
6. Nikko Jeffreys - graduate student in bioengineering (2022-date).
7. Regan Ellis - graduate student in bioengineering (2022-date).
8. Paola Carrillo Gonzalez - undergraduate senior in bioengineering (2021-2022).

Stanford University:

1. Eva de la Serna - graduate student in chemical engineering (2017-2021).
2. Julieta Gomez-Frittelli - graduate student in chemical engineering (2017-2021).
3. Abigail Grosskopf - graduate student in chemical engineering (2018-2021).
4. Jamieon Miller – 7th grade (2018-2020).
5. Emily Ming-Chun Pang – co-term graduate student in mechanical engineering (2018).
6. Eduardo Uribe – 7th grade (2017-2018).

7. Michelle Quizon – undergraduate student in mechanical engineering (summer 2017).

Professional Memberships

2021-Date Member, Society for Biomaterials
2018-Date Member, Biomedical Engineering Society
2007-Date Member, American Institute of Chemical Engineers
2010-2011 Tau Beta Pi Honors Society
2007-2011 Member, National Society of Black Engineers

ACADEMIC SERVICE AND LEADERSHIP

Conference planning

Gordon Research Seminar Physical Science of Cancer (co-chair) **February 2025**

Reviewing activities for peer-reviewed journals

Bioengineering and Translational Medicine **January 2022-Date**
Journal of Materials Chemistry B (Royal Society of Chemistry) **May 2021-Date**

Biomedical Engineering Society Conference co-chair

Cancer immunoengineering, immunomodulation and immunotherapy II **October 2023**
Engineering Immune Models **October 2023**
Engineering the stem cell microenvironment **October 2023**