

LaDeidra Monét Roberts, Ph.D.

227 Kelly Hall
325 Stanger Street
Virginia Tech
Blacksburg, VA 24061

EDUCATION

Cornell University, Ithaca, New York 08/2014-08/2019
Ph.D., Biomedical Engineering
M.S., Biomedical Engineering 3/2017

Georgia Institute of Technology, Atlanta, Georgia 05/2014
B.S. Biomedical Engineering

Georgia Tech Lorraine, Study Abroad 08/2012 - 12/2012
Metz, France

SCIENTIFIC PUBLICATIONS AND PRESENTATIONS (*indicates equal contribution)

Roberts LM, "A Motley Crew: Linking Intratumoral Heterogeneity to Invasion and Interstitial Fluid Flow," Gordon Research Conference, Physical Sciences of Cancer, Galveston, TX (Oral), February 2023

Shimpi AA, Tan ML, Vilkhovoy M, Dai D, **Roberts LM**, Kuo JC, Huang L, Varner JD, Paszek MJ, Fischbach C. Convergent approaches to delineate the metabolic regulation of tumor invasion by hyaluronic acid biosynthesis. *Adv Health Mat*, December 2022

Roberts LM, "A Motley Crew: Linking Intratumoral Heterogeneity to Invasion and Interstitial Fluid Flow," Emerging Leaders Symposium Keynote, University of Virginia (Oral), November 2022

Udayasuryan B, Nguyen T, Umaña A, **Roberts LM**, Ahmad R, Sobol P, Jones SD, Munson JM, Slade DJ, and Verbridge SS. *Fusobacterium nucleatum* induces pancreatic cancer cell proliferation and migration by regulating host autocrine and paracrine signaling. *Sci Signal*, October 2022

Roberts LM*, Perez MJ*, Balogh KN, Mingledorff G, Cross JV, and Munson JM. Myeloid Derived Suppressor Cells migrate in response to flow and lymphatic endothelial cell interaction in the breast tumor microenvironment. *Cancers*, June 2022

Roberts LM, Esparza C, Cornelison RC, Munson JM. "Development and characterization of VEGF-C overexpression cell line in murine glioma to probe vasculature functionality and interstitial fluid flow," Cancer Research Alliance Retreat, Fralin Biomedical Research Institute, Roanoke, VA (Poster), March 2022

Roberts LM, "The Sweet Spot: Glyco-diversity and opportunities in cancer and beyond," Virginia Tech Biomedical Engineering and Mechanics (BEAM) Research Seminar Series (Oral), October 2021

Roberts LM, Macias-Orhuela, Y, Atay, N, Stine, C, and Munson, JM. "Intratumoral

heterogeneity & invasion profiles in glioblastoma,” Biomedical Engineering Society (BMES) Annual Meeting (Oral, Virtual), Orlando, FL, October 2021

Roberts LM, “A Motley Crew: Linking Intratumoral Heterogeneity to Invasion and Interstitial Fluid Flow,” Emerging Scholars Program, Boston University (Oral), May 2021

Roberts LM* & Munson JM. Modulating Microenvironments for Treating Glioblastoma. *Curr Microenvironment Reports*, August 2020

Noble JM*, **Roberts LM***, Vidavsky NA*, Chiou AE, Fischbach C, Paszek MJ, Estroff LA, and Kourkoutis LF. Direct comparison of optical and electron microscopy methods for structural characterization of extracellular vesicles. *J Struct Biol*, April 2020.

Heinke C & **Roberts LM**. Contributed as co-host/Limper Science Advocate. “The Imposter Syndrome.” *Science Blender*, June 17, 2019, <http://scienceblender.com/8-the-imposter-syndrome/>

Shurer CR*, Kuo JC*, **Roberts LM***, Gandhi JG, Colville MJ, Enoki TA, Pan H, Su J, Noble JM, O’Donnell JP, Yin RY, Hollander MJ, Kourkoutis LF, Feigenson GW, Reesink HL, and Paszek MJ. Physical Principles of Membrane Shape Regulation by the Glycocalyx. *Cell*, June 2019

Roberts LM, “How Microvesicles Are Budding into the Cancer Conversation,” Edward A. Bouchet Annual Conference (Oral), Yale University, April 2019.

Roberts LM, Yin RY, Kuo JC, Noble JM, Su J, Gandhi JG, Shurer CR, Reesink HL, Kourkoutis LF, and Paszek MJ. “Microvesicle Shedding Regulated by the Glycocalyx,” Cornell Center on the Physics of Cancer Metabolism, Physical Sciences in Oncology Retreat (Poster), Cornell University, January 2018.

Vidavsky NA, Noble JM, **Roberts LM**, Chiou AE, Paszek MJ, Fischbach-Teschl CF, Kourkoutis LF, and Estroff LA. “Revealing Mechanisms of Microvesicle Biogenesis in Breast Cancer via in situ Microscopy,” Cornell Center on the Physics of Cancer Metabolism, Physical Sciences in Oncology Retreat (Poster), Cornell University, January 2018

Roberts LM, Yin RY, Noble JM, Shurer CR, Kuo JC, Gandhi JG, Su J, Reesink HL, Kourkoutis LF, and Paszek MJ. “Glycocalyx-Induced Membrane Shapes and Microvesicle Biogenesis and Shedding,” Biomedical Engineering Society (BMES) Annual Meeting (Poster), Atlanta, GA, October 2018.

Roberts LM, Shurer CR, Hollander M, Enoki, T, and Paszek MJ. “Microvesicle Induction by the Metabolically-Regulated Glycocalyx”, Biomedical Engineering Society (BMES) Annual Meeting (Oral), Phoenix, AZ, October 2017

Roberts LM, Shurer CR, Kuo JC, Gandhi JG, Colville MJ, Enoki T, and Paszek MJ. “Membrane Bending & Shape Changes by the Cancer Cell Glycocalyx”, Biomedical Engineering Society (BMES) Annual Meeting (Poster), Phoenix, AZ, October 2017

Roberts LM, Shurer CR, Hollander M, Enoki, T, and Paszek MJ. “Entropic Control of

Microvesicle Shedding in Breast Cancer,” Cornell Center on the Physics of Cancer Metabolism, Physical Sciences in Oncology Retreat (Poster), Cornell University, January 2017.

Roberts LM, Shurer CR, Hollander M, and Paszek MJ. “Muc1-induced Microvesicle Shedding in Breast Cancer: A Biophysical Phenomenon,” Biomedical Engineering Society (BMES) Annual Meeting (Poster), Minneapolis, October 2016.

Roberts LM, Shurer CR, Hollander MJ, and Paszek MJ. “Muc1-induced Microvesicle Shedding in Breast Cancer: A Biophysical Phenomenon,” National Academies of Science Ford Foundation Conference (Poster), Washington DC, September 2016.

Roberts LM, Shurer CR, Hollander MJ, and Paszek MJ. “Muc1-induced Microvesicle Shedding in Breast Cancer: A Biophysical Phenomenon,” Academic Research & Leadership Symposium at the National Society of Black Engineers Conference (Poster), Boston, MA, March 2016.

Platt MO, Evans D, Keegan PM, McNamara L, Parker IK, **Roberts LM**, Caulk AW, Gleason Jr. RL, Seifu D, Amogne W, and Clement P. Low-cost method to monitor patient adherence to HIV antiretroviral therapy using multiplex cathepsin zymography. *Molecular Biotechnology*. Jan 2016; 58(1):56-64

Parker IK, **Roberts LM**, Hansen L, Gleason Jr. RL, Sutliff RL, and Platt MO, Pro-atherogenic shear stress and HIV proteins synergistically upregulate cathepsin K in endothelial cells. *Annals of Biomedical Engineering*. Jun 2014;42(6):1185-1194.

Roberts LM and Platt MO, Implications of Highly Active Antiretroviral Therapy in the Development of Cardiovascular Disease in HIV Patients. *The Tower Undergraduate Research Journal of the Georgia Institute of Technology*. Jan 2014; 6(1): 30-32.
<https://www.scribd.com/document/203043513/The-Tower-Undergraduate-Research-Journal-Volume-VI-Issue-I>

Hansen L, Parker IK, **Roberts LM**, Sutliff RL, Platt MO, and Gleason Jr. RL, Azidothymidine (AZT) leads to arterial stiffening and intima-media thickening in mice. *Journal of Biomechanics*. April 2013. 46(9):1540-7.

Roberts LM, Parker IK, and Platt MO. “Effects of HAART Therapies on Arterial Remodeling in HIV+ Patients,” *Peach State LSAMP Eighth Annual Fall Symposium & Research Conference* (Oral), Marietta, Georgia, October 2013

Roberts LM, Parker IK, and Platt MO. “Antiretroviral Drugs and Their Effects on Arterial Remodeling and Protease Activity,” *Annual Biomedical Engineering Society Conference* (Poster), Seattle, Washington, September 2013

RESEARCH EXPERIENCE

Postdoctoral Research Associate, Munson Lab, Virginia Tech 07/2019 –01/2023

- Project: Examining cellular heterogeneity and meningeal lymphatics in glioma invasion in response to flow and the interface between cancer and cognition during disease progression
 - Project: Dissecting the role of meningeal lymphatics in glioblastoma

- Trained and developed skills in animal handling, surgery, and other practices in compliance with Virginia Tech Institutional Animal Care and Use Committee
- Expertise in 3D tissue engineered models in glioma research
- Expertise in tissue harvesting and processing with immunofluorescence and imaging
- Experienced in mentoring graduate students and postdoctoral research associates & leading the vascular sub-group
- Acquired technical skills: tissue engineered models, animal models, tissue harvesting, Luminex, ELISA

Graduate Research, Paszek Lab, Cornell University

11/2014 – 08/2019

- Project: How Microvesicles Are “Budding” Into the Cancer Conversation: The Role of Glycocalyx-Induced Membrane Bending
 - Discovered the mechanism of microvesicles through coupling of protein-protein interactions within the glycocalyx and the actin cytoskeleton in regulation of membrane shapes
- Project: Comparative Analysis of Techniques to Characterize Extracellular Vesicles
 - Utilized skill sets with electron microscopy and nanoparticle tracking analysis for creating a holistic approach for validation and characterization of extracellular vesicles
- Acquired technical skills: nanoparticle tracking analysis, scanning electron microscopy, fluorescence microscopy, flow cytometry, molecular biology, transfection, stable cell line production

Cornell Biomedical Engineering/Weill-Cornell Medical School Immersion Program

06/2015 - 08/2015

- Intensive 10-week summer immersion program at Weill-Cornell Medical College in New York City mentored under radiologist, Dr. George Shih.
- Worked with radiologists on projects involving breast cancer and patient tablet companion app
 - Writing literature summaries from a literature search on a project regarding recall rate and lack of comparison prior images
 - Data analysis on a project regarding stereotactic biopsy metallic clip migration post-mammogram in patients
 - Framed pilot study for *Daisy Patient Companion App* for the hospital waiting room from observations and data mining
 - Data analysis from project regarding a radiology technician protocol chatting platform in the emergency department

Undergraduate Research, Dr. Manu Platt, Georgia Tech 8/2011- 5/2014

- Performed immunohistochemistry with HIV-transgenic mouse aortic tissue to observe any effects such as proteolytic activity on inducing atherosclerotic remodeling
- Studied the effect of atherosclerotic remodeling with cathepsins via HIV proteins and highly active antiretroviral therapy
 - Served on panels for minority high school students about STEM fields and transition from high school to college and helped mentor students from Project Engaging New Generations at Georgia Tech through Engineering & Science (ENGAGES)

- Acquired technical skills: immunohistochemistry, cell culture, western blotting, cathepsin assay, cryo-sectioning, co-culture

INVITED TALKS/SOCIAL JUSTICE/DEI PRESENTATIONS

- “Re-imagining the Woman of Color Female Academic: Lessons Learned from a Pandemic/Social Justice Moment”, 2021 Faculty Women of Color in the Academy Conference (Virtual), April 2021
- “Forward: Why We Can’t Go Back to Where We Were,” Black History Month Seminar, Fralin Biomedical Research Institute, February 2021.
<https://fbri.vtc.vt.edu/events/community-events/2021-02-15-black-history-month-seminar.html> (Virtual)
- Building Allyship Series- “Combatting Anti-Blackness: A Fireside Chat” with Cornell Bouchet Scholars, Panelist, November 2020 (Virtual).
https://vod.video.cornell.edu/media/Combatting+Anti+BlacknessA+A+Virtual+%22Fireside+Chat%22+with+Cornell+Bouchet+Scholars/1_514_gp59h
- “Re-imagining the Black Female Academic: Lessons Learned from a Pandemic/Social Justice Moment”, BME Early Career Distinguished Lecture, 2020 BMES Annual Meeting (Virtual), October 2020

AWARDS & RECOGNITIONS

Postdoctoral Research Associate at Virginia Tech
Cell Mentors 1,000 inspiring Black scientists in America

Graduate Career at Cornell University

Zellman Warhaft Commitment to Diversity Award, Diversity Programs in Engineering, Spring 2019

Edward Alexander Bouchet Graduate Honor Society, Inducted Spring 2019 Social

Justice Award, Graduate & Professional Student Diversity Council, Spring 2018

Excellence in Leadership, Diversity Programs in Engineering, Spring 2016 National

Science Foundation Graduate Program Fellowship Program, Spring 2016 Ford

Foundation Pre-doctoral Fellowship, Spring 2015

Dean’s Excellence Fellowship, Cornell University, Fall 2014

Undergraduate Career at Georgia Tech

President’s Undergraduate Research Award (PURA), Spring 2014

Peach State LSAMP Oral Presentation in Life Sciences, Cellular and Molecular Biology, 2nd place, Fall 2013

Tower Award Recipient for Scholastic Achievement, Silver & Bronze Category (2009-2013)
(Awarded by the Office of Minority Educational Development (OMED) for academic merit for GPA range 3.0-3.49 for bronze; silver for GPA range 3.5-3.99)

Whitaker Undergraduate Program Award for Study Abroad, Fall 2012
(Awarded by the Whitaker International Program and the Institute of International Education (IIE) for studying abroad at Georgia Tech Lorraine)

ACTIVITIES

Organizing/Planning Committee Member, 2023 Afro-Biotech Conference

Guest speaker, Henrietta Lacks Celebration, Melrose Branch Library, Roanoke, VA, May 2023

Guest panelist, Black History Month's The Tea Is..., Black Graduate Student Organization, Virginia Tech, March 2023

Postdoctoral Career

Co-organizer, Juneteenth Celebration of Black Scientists and Engineers, Fralin Biomedical Research Institute, Roanoke, VA, June 2022

"A Motley Crew: Linking intratumoral heterogeneity to invasion and interstitial fluid flow (IFF) in glioma", Guest lecturer, *Introduction to Scieneering Freshman Seminar*, October 2021

"From the glycocalyx to interstitial fluid flow: opportunities in cancer," 2021 Cornell BMES Alumni Symposium Invited Speaker (Virtual), June 2021

The Martlets Society, World Beyond Academia (WBA) Talks, Season 1, Episode 7, Co-host, <https://www.martlets-society.com/events/wba-talk/season-1>

Guest panelist, Tea from the Tower: Tips and Advice on Applying for Nationally Competitive Fellowships (Virtual), *The Ebony Tower*, https://www.youtube.com/watch?v=zp_BEI5A8ls, July 2020

Biomedical Engineering and Mechanics (BEAM) Diversity Committee, Fall 2019 – Fall 2020

Graduate School Workshops

- Co-lead in efforts along with graduate student, Michelle Dickerson, on giving workshops and setting up panels for undergraduates who aspire to go to graduate school

Community Outreach

- STEAM Workshop, Virginia Tech, July 2019
- STEM-ability Workshop, Virginia Tech, July 2019
- Virginia Tech Science Festival, November 2019
- Virginia Tech Science Festival, November 2020
- Fralin Biomedical Research Institute Brain School, March 2022

- Virginia Tech Science Festival, November 2022

Graduate Career

Organized the “Black Hair Love” panel and hair product drive for the Black Graduate & Professional Student Organization general body meeting

- Organized a panel of graduate and professional students to speak about their hair care ranging from permed to natural hair to dreadlocks and braids for Black men and women in our community
- Organized a hair product drive for people to share extra hair products with others for their regiment

Graduate Resident Fellow, Hans Bethe House, Cornell University, Fall 2016 – Spring 2019

Invited speaker/panelist, “The Power of Networking” Session, Peach State LSAMP Conference, Fall 2017

Black Graduate & Professional Student Association (BGPSA), President, Cornell University, 2016

Black Graduate & Professional Student Association (BGPSA), Academic Chair, Cornell University, 2015

Graduate Student Ambassador, Office of Inclusion & Student Engagement, Cornell University, 2015 - 2019

- Spoke on panels, including at the GEM Annual Consortium, about funding for graduate school as well as helped with recruiting at the tabling orientation to provide students with information about graduate school at/for Cornell University
- Recruited at the Peach State LSAMP Conference in Atlanta, GA as well as Biomedical Engineering Annual Meetings

Biomedical Engineering Society (BMES), Cornell University, Outreach Committee, 2014

- Leading and planning annual outreach program in November called “Upward Bound,” which invites first generation prospective college students to perform hands-on scientific activities

Community Outreach

- Girl Scouts Engineering Day (2014-2016)
- Into the Streets (2014, 2016)

Undergraduate career

African American Recruitment Team, Vice President, Georgia Tech, 2013-2014

- Created “GT Pen Pals”, which was a novel program in the organization that connected current students with prospective students through matching based off of hometown, major, and interests to facilitate recruitment and transition into Georgia Tech through email correspondence and other modes of communication

Peach State Louis Stokes Alliance for Minority Participation (LSAMP), Georgia Tech, 2011- 2013

- Mentored 7 other undergraduate students in BME on academics as well as foster a community among mentees to endure challenges at Georgia Tech together

Gamma Beta Phi Honor Society, Vice President of Membership, Georgia Tech, 2011

- Performed community service such as assisting with activities with the Atlanta Boys' and Girls' Club
 - Tutored high school students for end-of-course tests (EOCT) in Biology and American History

LEAD/ Summer Engineering Institute at Georgia Tech, Counselor/ Room Advisor, Georgia Tech, Summer(s) 2010, 2011

- Facilitated minority high school students' development of skills in the STEM fields as well as presentation skills

PROFESSIONAL AFFILIATIONS

Biomedical Engineering Society (BMES), Member since 2013

American Association of Cancer Research, Member since 2023