JENNIFER MUNSON, PHD

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2020- **Associate Professor with Tenure,** Virginia Tech
Associate Director-Small Bore Preclinical Imaging Facility
Co-Director Virginia Tech Cancer Research Alliance
Fralin Biomedical Research Institute at Virginia Tech-Carilion
Department of Biomedical Engineering & Mechanics, School of Engineering
Virginia Tech-Wake Forest School of Biomedical Engineering and Sciences
Wake-Forest Comprehensive Cancer Center, Wake-Forest Baptist Health
Institute for Critical Technology and Applied Science, Virginia Tech
Center for Engineered Health, Virginia Tech
Translational Biology Medicine and Health Graduate Program, VT-Carilion

2017-2020 **Assistant Professor,** Virginia Tech
Virginia Tech, Department of Biomedical Engineering and Mechanics, School of Engineering
Virginia Tech-Wake Forest School of Biomedical Engineering and Sciences
School of Neuroscience, Virginia Tech
Wake-Forest Comprehensive Cancer Center, Wake-Forest Baptist Health
Institute for Critical Technology and Applied Science, Virginia Tech
Center for Engineered Health, Virginia Tech

2014-2017 **Assistant Professor,** University of Virginia
Department of Biomedical Engineering
School of Medicine
School of Engineering and Applied Science
UVa Cancer Center

2011-2013 **Postdoctoral Associate,** Swiss Federal Institute of Technology (EPFL), Lausanne, Switzerland
Whitaker International Postdoctoral Fellowship, Whitaker Foundation
Advisor: Melody Swartz, PhD

2011 **Ph.D. in Bioengineering**
Georgia Institute of Technology, School of Chemical Engineering, Atlanta, GA
Advisor: Ravi Bellamkonda, PhD

2009-2010 **Fulbright Fellow,** Swiss Federal Institute of Technology, Lausanne, Switzerland
U.S. Department of State and the Swiss Confederation

2006-2007 **Engineer,** Genentech, Inc., South San Francisco, CA

2006 **B.S. Chemical Engineering and Neuroscience,** Magna cum laude with departmental honors
Tulane University, School of Engineering, New Orleans, LA

FELLOWSHIPS, HONORS AND AWARDS

2023 Advancing Science through Academic Publications, Atrium Health-Wake Forest Baptist
2023 Gordon Research Conference Elected Chair, Physical Science of Cancer
2022 Liviu Librescu Memorial Faculty Prize, Department of Biomedical Engineering & Mechanics
2021 Emerging Leader Award, Ivy Foundation
2021 Leader in Research, Department of Biomedical Engineering & Mechanics
2019 Dean's Excellence Seminar Speaker, Cornell University
2019 Leader in Research, Department of Biomedical Engineering & Mechanics
2019 Dean's Award Outstanding New Assistant Professor, College of Engineering, Virginia Tech
2017 Young Innovator Award, Cellular and Molecular Bioengineering
2016 Rita Schaffer Young Investigator Award, Biomedical Engineering Society

2013 AICR Short Talk Award, Beatson International Cancer Conference, Glasgow, Scotland
2011-13 Whitaker International Postdoctoral Fellowship, Whitaker Foundation
2007-11 National Science Foundation Graduate Research Fellowship, NSF
2009 Fulbright Fellowship, Department of State & Swiss Confederation
2007-11 President's Fellowship, Georgia Institute of Technology
2006 Samuel L. Sullivan Award for Service and Scholarship, Tulane University
2006 American Chemical Society Outstanding Senior Award, Tulane University
2002-06 Distinguished Scholars Award, Tulane University

RESEARCH

PUBLICATIONS (*CORRESPONDING, †UNDERGRADUATE AUTHOR)

1. AC Suarez, JH Hammel, **JM Munson***, Modeling Lymphangiogenesis: Translating in vitro metrics to in vivo outcomes. *Microcirculation. In press.*
2. B Udayasuryan, T Nguyen, A Umana, R Ahmad, LM Roberts, P Sobol, S Jones, **JM Munson,** D Slade, S Verbridge nucleatum induces pancreatic cancer cell proliferation and migration by regulating host autocrine and paracrine signaling. *Science Signaling*, *In press. COVER*
3. P Jin, **JM Munson***. Fluid Flow in Brain Cancer and Neurological Disease. *WIRES Mechanisms of Disease.* e1582 (2022). 10.1002/wsbm.1582
4. LM Roberts, MJ Perez, KN Balogh, G Mingledorff, JV Cross, **JM Munson***. Myeloid Derived Suppressor Cells migrate in response to flow and lymphatic endothelial cell interaction in the breast tumor microenvironment. *Cancers.* 14(12): 3008 (2022) DOI: 10.3390/cancers14123008
5. RC Cornelison, JX Yuan, KM Tate, A Petrosky†, GF Beeghly, M Bloomfield, SC Schwager†, AL Berr†, D Cimini, FF Bafakih, JW Mandell, BW Purow, BJ Horton, **JM Munson***. A patient-designed tissue-engineered model of the infiltrative glioblastoma microenvironment, *Nature Precision Oncology*. 6(54) (2022). DOI: 10.1038/s41698-022-00290-8
6. CA Stine, **JM Munson***, Autologous gradient formation under differential interstitial fluid flow environments. *Biophysica.* 2(1): 16-33 (2022). DOI: 10.3390/biophysica2010003
7. AR Harris, MS Azimi, R Cornelison, FN Azar, DC Llaneza, M Belanger, A Mathew, Svyatoslav Tkachenko, S Esparza, MJ Perez, CB Rosean, RR Bostic, RC Cornelison, KM Tate, SM Peirce-Cottler, C Paquette, A Mills, CN Landen, J Saucerman, PM Dillon, RR Pompano, MA Rutkowski, **JM Munson***. Platinum Chemotherapy Induces Lymphangiogenesis in Cancerous and Healthy Tissues That Can be Prevented With Adjuvant Anti-VEGFR3 Therapy, *Frontiers Oncology.* DOI: 10.1101/781443
8. GF Beeghly*†, C Thomas†, JX Yuan, AR Harris, **JM Munson***. Engineering patient-driven models to examine breast cancer cell behavior after metastasis to the brain. *Bioengineering.* 9(2): 44 (2022). https://doi.org/10.3390/bioengineering9020044
9. JE Ortiz-Cardenas, JM Zatorski, A Arneja, AN Montalbine, **JM Munson**, CJ Luckey, RR Pompano*, In situ photopatterning of cell laden biomaterials for spatially organized 3D cell cultures in a microfluidic chip. *Lab on a Chip.* 4: 100018 (2022). doi.org/10.1016/j.ooc.2022.100018
10. JH Hammel, SR Cook, JM Zatorski, RR Pompano*, **JM Munson***. In vitro models of the immune system – from basic science to screening of therapeutics. *Advanced Drug Delivery Reviews.* 182: 114111 (2022). doi.org/10.1016/j.addr.2022.114111
11. RT Woodall, P Sahoo, Y Cui, BT Chen, MS Shiroishi, C Lavini, P Frankel, M Gutova, CE Brown, **JM Munson**, RC Rockne*. Repeatability of tumor perfusion kinetics from dynamic contrast-enhanced MRI in glioblastoma. *Neuro-oncology Advances*. 3(1):vdab174 (2021) https://doi.org/10.1093/noajnl/vdab174
12. R DeVita & **J Munson** Special Issue on the Advances in Engineering for Women's Health. *Annals of Biomedical Engineering*. 49: 1785-1787 (2021).

13. O Turk†, R Woodall, M Gutova, CE Brown, RR Rockne, **JM Munson***. Delivery strategies for cell-based therapies in the brain: overcoming multiple barriers. *Drug Delivery and Translational Research.* 11(6): 2448-2467 (2021). 10.1007/s13346-021-01079-1
14. JA McGuire, JL Monclova, AC Salazar Coaniti, CA Stine, KC Toussaint, **JM Munson**, DA Dillard, R DeVita*, Tear propagation in vaginal tissue under inflation. *Acta Biomaterialia.127: 193-204.* (2021)
15. T MacDonald, J Liu, A Malhotra**, JM Munson**, JC Park, K Wang, B Fei, RV Bellamkonda, JL Arbiser. Liposome-Imipramine Blue Inhibits Sonic Hedgehog Medulloblastoma In Vivo. *Cancers.* (2021)
16. KC Chatterjee, N Atay, D Abler, P Sahoo, S Bhargava, RC Rockne, **JM Munson***. Utilizing Dynamic Contrast-Enhanced Magnetic Resonance Imaging (DCE-MRI) to Analyze Interstitial Fluid Flow and Transport in Glioblastoma and the Surrounding Parenchyma in Human Patients. *Pharmaceutics*. 13(2): 212. (2021)
17. JH Hammel, SR Cook, MC Belanger, **JM Munson***, RR Pompano*. Modeling Immunity in vitro: Slices, chips, and engineered tissues. *Annual Review of Biomedical Engineering*. *23.* (2021)
18. LM Roberts, **JM Munson***, Modulating microenvironments for treating glioblastoma, *Current Tissue Microenvironment Reports*, (2020) 1-13.
19. CT Curley, BP Mead, N Kim, K Negron, GW Miller, W Garrison, KM Kingsmore**, JM Munson**, A Klibanov, J Soo, J Hanes, RJ Price*, Blood-brain tumor barrier opening with MR image-guided focused ultrasound augments interstitial flow and facilitates nanoparticle-mediated transfection. *Science Advances*. 6(18): eaay1344 (2020).
20. KT Chatterjee, CM Esparza, JM Munson*, Measuring, manipulating and modeling fluid flow in the brain. *J Neuroscience Methods.* 333: 108541 (2020). https://doi.org/10.1016/j.jneumeth.2019.108541
21. S Galarza, H Kim, NJ Atay, SR Peyton*, JM Munson*, 2D or 3D? How in vitro cell motility is conserved across dimensions and predicts in vivo invasion. *Bioengineering & Translational Medicine.* E10148 (2019) DOI: 10.1101/627281.
22. CA Stine, **JM Munson**, Convection enhanced delivery: role of increased interstitial fluid flow. *Frontiers: Oncology*. 9: 966 (2019). DOI: 10.3389/fonc.2019.00966
23. **JM Munson**, Interstitial fluid flow under the microscope: is it a future drug target for high grade brain tumours such as glioblastoma? *Expert Opinion on Therapeutic Targets.* 23(9): 725-728 (2019). DOI: 10.1080/14728222.2019.1647167
24. EA Brooks, S Galarza, MF Gencoglu, RC Cornelison, **JM Munson**, SR Peyton, Applicability of drug response metrics for cancer studies using biomaterials. *Phil Transactions of the Royal Society B*. 374(1779), 20180226 (2019). DOI:10.1101/408583.
25. KM Tate, **JM Munson**, Assessing drug response in engineered neural microenvironments. *Brain Research Bulletin*. 150: 21-34 (2019). DOI: 10.1016/j.brainresbull.2019.04.027
26. S Shim, M Balanger, AR Harris, **JM Munson**, RR Pompano, Two-way communication between ex vivo tissues on a microfluidic chip: application to tumor-lymph node interaction. *Lab on a chip*. 19, 1013-1026 (2019). DOI: 10.1039/C8LC00957K .
27. RC Cornelison, CE Brennan†, KM Kingsmore, **JM Munson*** Convective forces increase CXCR4-dependent glioblastoma cell invasion in GL261 murine model" *Scientific Reports, **8*** 17057 (2018)**.** DOI: 10.1101/451286
28. S Da Mesquita, A Louveau, A Vaccari, I Smirnov, RC Cornelison, KM Kingsmore, C Contarino, S Onengut-Gumuscu, E Farber, D Raper, KE Viar, W Baker, N Dabhi, G Oliver, S Rich, **JM Munson,** CC Overall, ST Acton, J Kipnis*, Functional aspect of meningeal lymphatics in ageing and Alzheimer's disease. *Nature*. (2018). *COVER.*
29. RC Cornelison, **JM Munson***. Perspective on Translating Biomaterials Into Glioma Therapy: Lessons From in Vitro Models. Frontiers in materials. 2018 May; 5(27).
30. Kingsmore KM, Vaccari A, Abler D, Cui SX, Epstein FH, RC Rockne, ST Acton, **JM Munson*** MRI analysis to map interstitial flow in the brain tumor microenvironment. Applied physics letters: Bioengineering. 2, 031905 (2018). Doi : 10.1063/1.5023503. *COVER.*
31. AR Harris, MJ Perez, **JM Munson**. Docetaxel facilitates lymphatic-tumor crosstalk to promote lymphangiogenesis and cancer progression. *BMC Cancer*. 2018 Jul 6;18(1):718. doi: 10.1186/s12885-018-4619-8. PubMed PMID: 29976154; PubMed Central PMCID: PMC6034223.
32. JX Yuan, AR Harris, **JM Munson** "Assessing multiparametric drug response in tissue engineered tumor microenvironment models" *Methods,* 134-135:20-31 (2017). doi: 10.1016/j.ymeth.2017.12.010.

33. JX Yuan, **JM Munson**, Quantitative immunohistochemistry of the cellular microenvironment in patient glioblastoma resections, *Journal of Visualized Experiments* 125 (2017). doi: 10.3791/56025.

34. DK Logsdon, GF Beeghly†, **JM Munson**, Chemoprotection across the tumor border: cancer cell response to doxorubicin depends on stromal fibroblast ratios and interstitial therapeutic transport, *Cellular Molecular Bioengineering,*1-19 (2017). doi: 10.1007/s12195-017-0498-3.

35. KM Kingsmore, DL Logsdon, BW Purow, **JM Munson**, Interstitial flow differentially increases patient-derived glioma stem cell invasion via CXCR4/CXCL12/CD44-mediated mechanisms, *Integrative Biology.* 8(12):1246-60 (2016) . DOI: 10.1039/c6ib00167j.

36. JX Yuan, FF Bafakih, JW Mandell, BJ Horton, **JM Munson**, Quantitative Analysis of the Cellular Microenvironment of Glioblastoma to Develop Predictive Statistical Models of Overall Survival, *Journal of Neuropathology and Experimental Neurology*. nlw090 (2016). doi:10.1093/jnen/nlw090.

37. BA Corliss, MS Azimi, **JM Munson**, SM Peirce, WL Murfee, Macrophages: An Inflammatory Link between Angiogenesis and Lymphangiogenesis, *Microcirculation.* 23(2): 95-121 (2016). doi: 10.1111/micc.12259.

38. **JM Munson,** AC Shieh, Interstitial fluid flow in cancer: implications for disease progression and treatment, *J Cancer Management and Research,* 6, 317-328 (2014). doi: 10.2147/CMAR.S65444.

39. **JM Munson**, RV Bellamkonda & MA Swartz, Interstitial flow increases glioma invasion via CXCR4-dependent autologous chemotaxis in a 3D microenvironment. *Cancer Research* 73(5): 1536-1546 (2013) doi: 10.1158/0008-5472.CAN-12-2838.

40. **JM Munson**, MY Bonner, L Fried, JL Arbiser, RV Bellamkonda, Identifying new small molecule anti-invasive compounds for glioma treatment. *Cell Cycle* 12 (14):1-10 (2013). doi: 10.4161/cc.25334.

41. BR Roller, **JM Munson**, PA Santangelo, B Brahma, RV Bellamkonda, Evans blue nanocarriers visually demarcate margins of invasive gliomas, *Drug delivery and Translational Research* 5(2): 116-24 (2015). doi: 10.1007/s13346-013-0139-x.

42. **JM Munson**, L Fried, SA Rowson†, MY Bonner, L Karumbaiah, B Diaz, SA Courtneidge, UG Knaus, DJ Brat, JL Arbiser, RV Bellamkonda, Anti-invasive adjuvant therapy with Imipramine Blue enhances chemotherapeutic efficacy against glioma. *Science Translational Medicine* 4, 127ra36 (2012). doi: 10.1126/scitranslmed.3003016.

43. IC Clements, **JM Munson** & RV Bellamkonda, "Biomaterials for Neural Engineering," Biomaterials Science. 3rd ed., Elsevier Press, ed. B Ratner, 2012.

44. **JM Munson** & WT Godbey. "Gene Therapy," Biomedical Engineering Handbook: Tissue Engineering and Artificial Organs, 4th ed., CRC Press, ed. J. Fisher and A. Mikos, 2006.

ENTREPRENEURSHIP

1. **Co- Founder, President, Chief Research Officer,** Cairina, Inc., Medical image analysis company with applications in cancer treatment planning, Roanoke, VA
   - Roanoke Accelerator Mentorship Program, 2023 Cohort
   - Proof-of-Concept Award, Virginia Tech LAUNCH Program, 2023, $50,000
   - Virginia Innovation Partnership Corporation Funding, 2023, $25,000

PATENTS

JM Munson, JA Arbiser, RV Bellamkonda, Nanocarrier therapy for treating invasive glioma. US Patent Number PCT/US2010/031914

JM Munson, RW Woodall, RC Rockne, Interstitial Fluid Transfer from Medical Imaging Data, Provisional Filing

CURRENT FUNDING

1. **Sebastian Strong Foundation** 8/1/2022-7/31/2024
   $670,000 ($200,000 subaward)
   Co-I (PI: Javad Nazarian)**:** Focused Ultrasound Coupled Therapy for DMG

2. **Seale Innovation Fund (Internal VT)** 1/1/2022-12/31/2022
   $100,000

PI: Sonodynamic sensitizers for DIPG

3. **National Cancer Institute MERIT R37CA222563** 12/15/2017-11/30/2024
   $2,600,146
   PI: Interstitial fluid flow regulates glioma cell invasion

4. **National Institute of Bioimaging and Bioengineering U01EB029127** 9/17/2019-9/30/2024
   $2,906,527 ($890,000 subaward to Munson)
   Co-I (PI: Rebecca Pompano)**:** A spatially organized microphysiological model of a human lymph node

5. **National Institute of Neurological Disorders and Stroke R01NS115971** 4/1/2021-3/31/2026
   $4,147,089
   PI (Multi-PI: Christine Brown and Russell Rockne**)**: The impact of interstitial fluid flow on CAR T cell trafficking, distribution, and efficacy

6. **National Institute on Aging R01 AG071661-01** 5/1/2021-4/30/2026
   $ 3,569,118
   PI: Interstitial fluid flow in Alzheimer's Disease Progression

7. **Ivy Foundation Emerging Leaders Award** 7/1/2021-6/30/2023
   $500,000
   PI: Patient specific therapies based on interstitial fluid flow

8. **National Institute of Bioimaging and Bioengineering R21EB027979** 2/1/2020-1/31/2024
   $602,632
   Co-I (PI: Eli Vlaisavljevich)**:** Nanoparticle-mediated Histotripsy (NMH) for Noninvasive and Targeted Ablation of Metastatic Breast Cancer

9. **Lipedema Foundation** 10/1/2021-9/30/2023
   $250,000 ($120,000 subaward to Munson)
   PI (Multi-PI with Evangelia Bellas): Characterization of biotransport through engineered lipedemic tissues

PENDING FUNDING

COMPLETED FUNDING

- **ICTAS-REAP $50,000** 10/1/2020-9/30/2022
  Co-PI: Pharmacological Characterization of NMDA Receptor Modulators Using Engineered Microenvironments
- **National Institute of Aging R37CA222563S2 $390,720** 8/1/2019-11/30/2020
  PI: Interstitial fluid flow in Alzheimer's Progression
- **Center for Engineered Health, ICTAS, Virginia Tech $15,000** 10/15/2019-6/1/2020
  PI: Biophysical outcomes of radiation treatment in glioblastoma
- **VT Provost Office New Faculty Mentoring Grant $1,500** 2018-2020
  PI: Attendance at Faculty Leadership Program, Boston, MA
- **School of Medicine Research and Development $25,000** 6/1/2016-5/31/2017
  PI: An in vitro model of the glioblastoma-neural interface
- **Cancer Center Transdisciplinary Project Award (University of Virginia) $100,000** 12/1/2014-11/30/2016
  Co-PI: An engineered model of the premetastatic niche for mechanistic and therapeutic studies
- **American Cancer Society- Institutional Research Grant (ACS/University of Virginia) $25,000** 12/2014-12/2015
  PI: The Role of Interstitial Flow in Glioma Progression and Therapeutic Response
- **Coulter Foundation (University of Virginia) $140,000** 7/1/2014-6/30/2016
  PI: Screening system and decision-making strategy for brain cancer therapeutic intervention
- **Cancer Center Transdisciplinary Project Award (University of Virginia) $100,000** 11/1/2014-10/31/2015
  Co-I: Targeting radiation resistance in glioma

INVITED TALKS

1. Title: TBD. UNC-NCSU, Department of Biomedical Engineering, Raleigh, NC, September 2023
2. Title: TBD. Virginia Commonwealth University, Department of Biomedical Engineering, Richmond, VA, August 2023
3. Title: TBD. University Texas-Dallas, Department of Biomedical Engineering, Dallas, TX, September 2023
4. Fluid flows in brain cancer. Before Mechanobiology had a Name Symposium, IBEC, Barcelona, Spain, May 2023
5. Engineering patient-informed cellular models of glioblastoma for therapeutic testing. AACR Annual Meeting Education Day, Orlando, FL, April 2023
6. Flow in the brain: cancer and Alzheimer's Disease. Facultea Talk. Ambler Johnston Hall (West). February 2023.
7. Interstitial fluid flow in the brain tumor microenvironment. Tulane University, Department of Biomedical Engineering, New Orleans, LA, September 2022
8. Interstitial fluid flow in the brain tumor microenvironment. University of Wisconsin, Department of Biomedical Engineering, Madison, WI, September 2022
9. Interstitial fluid flow as a driver of glioma progression. Precision Neuroscience Conference, Roanoke, VA, May 2022
10. Brain drain: fluid flow in the brain. HokieTalks. Virginia Tech. March 2022.
11. Leveraging interstitial fluid flow to identify and predict progression in glioma. World Congress of Biomechanics, Taipei, Taiwan, July 2022
12. Brain drain: fluid flow in the brain. Virginia Tech Alumni Weekend. Virginia Tech. July 2022.
13. Interstitial fluid flow as a driver of glioma progression. International Cerebrospinal Fluid Dynamics Symposium, University of Florida, Gainesville, FL, June 2022
14. Interstitial fluid flow as a driver of glioma progression. Neuro-oncology symposium, University of Minnesota, Minneapolis, MN, May 2022
15. Targeting interstitial fluid flow and its effects in glioblastoma. Carilion Department of Neurosurgery VT-RUN Series, Roanoke, VA, February 2022
16. Interstitial fluid flow in the brain tumor microenvironment. Signaling and Biotechnology Symposium, Virginia Tech-Wake Forest, Virtual, November 2021
17. Tissue engineering the glioma microenvironment (with interstitial flow). Advanced Biomanufacturing Symposium, University of Virginia, July 2021
18. Measuring and modeling interstitial flow in the brain. Mid-career mechanobiology symposium, University of Florida, October 2021
19. Interstitial fluid flow in the brain microenvironment. University of Minnesota, Department of Biomedical Engineering, Mpls, MN, February 2020
20. Interstitial fluid flow in the brain: contributions to glioma progression. City College New York Department of Biomedical Engineering, NY, NY, December 2019
21. Interstitial fluid flow in the brain microenvironment: impact on cancer. Cornell University Department of Biomedical Engineering, Ithaca, NY, December 2019
22. Interstitial fluid flow in the brain tumor microenvironment. Renssaeler Polytechnic Institute Department of Biomedical Engineering, Troy, NY, October 2019
23. Interstitial fluid flow in the brain tumor microenvironment. University of Arkansas Department of Biomedical Engineering, Fayetteville, AR, November 2019
24. Role of interstitial fluid flow in drug delivery, Society of Neuro-Oncology SCIDOT Annual Meeting, Phoenix, AZ , November 2019
25. Harnessing in vitro models to study therapeutic response at the tumor-lymphatic interface. NAVBO Vascular Biology, Pacific Grove, CA, October 2019.
26. Targeting interstitial fluid flow and its effects in glioblastoma. Society for Biological Engineering Bioengineering and Translational Medicine, Durham, NC, October 2019.
27. Interstitial fluid flow in the brain tumor microenvironment. Cancer and Cognition Group, Wake Forest School of Medicine, Winston-Salem, August 2019.
28. Interstitial fluid flow as a driver of glioma invasion. Molecular Cellular Biology Program, University of Massachusetts-Amherst, May 2019.
29. Interstitial fluid flow in the brain tumor microenvironment. Computational Tissue Engineering Graduate Program, Virginia Tech, Blacksburg, VA.
30. Interstitial flow in the brain: contributions to glial response and disease. Wake Forest Comprehensive Cancer Center Brain Tumor Center of Excellence, Winston-Salem, NC, November 2018

31. Imaging interstitial fluid flow in brain tumors. Biomedical Engineering Society Annual Meeting, Imaging and Instrumentation, Atlanta, GA, October 2018.
32. Interstitial flow in the brain: contributions to glial response and disease. 6th International Conference on Glial Biology in Medicine, Roanoke, VA, June 2018.
33. In vivo imaging of interstitial flow and histological correlation within the brain tumor microenvironment. World Congress of Biomechanics, Brain Biotransport, Dublin, Ireland, July 2018.
34. Going with the flow: how tumor cells use fluid flow to move. Biotechnology Educators Conference, Biocomplexity Institute, Virginia Tech, Blacksburg, VA, July 2018.
35. Interstitial fluid flow in the brain tumor microenvironment. City of Hope Cancer Center, Los Angeles, CA, April 2018.
36. Using patient data to inform in vitro models for testing of therapeutics: impact of the tumor microenvironment, Virginia Nanosymposium, Roanoke, VA, April 2018.
37. Chemoprotection across the tumor border: cancer cell response to doxorubicin depends on stromal fibroblast ratios and interstitial therapeutic transport. Cellular and Molecular Bioengineering Young Innovators, BMES Annual Meeting, Phoenix, AZ.
38. Interstitial fluid flow in the brain tumor microenvironment Virginia Tech Department of Biomedical Engineering & Mechanics, Blacksburg VA, December 2016.
39. Interstitial fluid flow in the brain tumor microenvironment. 2017: Columbia University Department of Biomedical Engineering, New York, NY, January 2017.
40. Interstitial fluid flow and the cellular tumor microenvironment: effects on invasion and therapeutic outcomes. University of Michigan, Department of Biomedical Engineering, Ann Arbor, MI, January 2017.
41. Interstitial fluid flow in brain tumors. Biomedical Engineering Society Rita Schaffer Award Presentation, Minneapolis, MN.
42. Role of microenvironment in glioblastoma prognosis. University of Virginia, Department of Pathology, Charlottesville, VA, 2016.
43. Lymphatics in progression of breast cancer University of Virginia, Department of Hematology/Oncology, Charlottesville, VA , 2016.
44. Interstitial fluid flow in glioma invasion University of California San Francisco Cancer Center Microenvironment subgroup, San Francisco ,CA, 2015.
45. Interstitial fluid flow in glioma invasion. Virginia Commonwealth University Department of Chemical Engineering, Richmond, VA, 2015.
46. Interstitial fluid flow in the brain tumor microenvironment, University of Virginia, Department of Neuroscience, Charlottesville, VA.
47. Contributions of the tumor microenvironment to disease progression. University of Virginia Cancer Center, Charlottesville, VA, 2014.
48. Lymphatic-fibroblast crosstalk in breast cancer World Congress of Biomechanics, Boston, MA, August 2014.

CONFERENCE PRESENTATIONS (PRESENTER; †UNDERGRADUATE AUTHOR)

1. S Esparza, K Eden, N Alinezhadbalalami, SS Verbridge, JM Munson. Temporal microvascular remodeling follows high-frequency irreversible electroporation therapy in a breast cancer mouse model. Lymphatic Forum. Banff, Canada. June 2023.
2. JJ Cunningham, CM Esparza, CA Stine, N Atay, **JM Munson**, Interstitial Fluid Flow as a Predictor for GBM Invasion, Progression, and Recurrence. Gordon Research Conference Physical Science of Cancer, February 2023.
3. CM Esparza, **JM Munson**, Investigating location as a local driver of interstitial fluid flow, invasion, and delivery. Gordon Research Conference Physical Science of Cancer, February 2023.
4. LM Roberts, Y Macias-Orihuela, A Venkanagari, S Krishnamoorthy, **JM Munson**. A motely crew: linking intrautmoral heterogeneity to invasion and interstitial fluid flow in glioma Gordon Research Conference Physical Science of Cancer, February 2023.
5. CA Stine, IF Kimbrough, **JM Munson**. Intravital imaging to simultaneously manipulate and measure interstitial fluid flow and its effects. Gordon Research Conference Physical Science of Cancer, February 2023.
6. GG Mendes, JP Arroyo, C Brocke, M Gutova, CB Brown, **JM Munson**. Evaluating the impact of interstitial fluid flow on CAR T cell therapy for GBM. Gordon Research Conference Physical Science of Cancer, February 2023.
7. JH Hammel, JJ Cunningham, E Bellas, **JM Munson**, Imaging of interstitial transport in normal and diseased tissues. Lipedema Foundation Annual Retreat, December 2022, Reston, VA.

8. S. Haynes, A. Bock, K. Herrema, A. Kumar, J. Sims, N. Cook, **J. Munson**, and A. E. Staples, 75th Annual Meeting of the APS Division of Fluid Dynamics, American Physical Society, Indianapolis, Indiana, A focus group study of DEI climate and needs in an engineering department at a STEM-focused Research I institution, November 22nd, 2022; Bulletin of the American Physical Society, 67 (17): Z27.00007.
9. SA Howerton, **JM Munson**, S1PR3 is differentially expressed at the tumor invasive front across patients with glioblastoma, Precision Neuroscience, June 2022, Roanoke, VA.
10. JH Hammel, RR Pompano, **JM Munson**, In vitro organization of lymph node stromal networks: impacts of matrix composition and interstitial fluid flow, Microphysiological Systems Summit, May 2022, New Orleans.
11. CA Stine, IF Kimbrough, **JM Munson**, Intravital Imaging to Simultaneously Manipulate and Measure Interstitial Fluid Flow and its Effects in Glioblastoma Mouse Model. Gordon Research Symposium/Conference: Physics of Cancer. Canceled 2022.
12. LM Roberts, Y Macias-Orihuela, **JM Munson**, Intratumoral heterogeneity and invasion profiles of sub-clonal populations in GBM, Biomedical Engineering Society Annual Meeting, Orlando, FL, October 2021.
13. N Atay, I Athanasiadi, S Kodikalla†, M Kumar†, **JM Munson**, Chemotaxis of Patient-Derived Glioma Stem-Like Cells Towards Irradiated Hyaluronan, Biomedical Engineering Society Annual Meeting, Orlando, October 2021.
14. S Esparza, G Beeghly†, **J Munson**, S Verbridge, , Biomedical Engineering Society Annual Meeting, Orlando, FL, October 2021
15. JH Hammel, L Jonart, P Gordon**, JM Munson**, Novel Meningeal Lymphatic Model for Evaluation of Leukemia CNS Invasion, Biomedical Engineering Society Annual Meeting, Orlando, FL, October 2021
16. KM Tate, K Herrema†, **JM Munson**, Patient Specific Alzheimer's Disease Model for Assessing Amyloid Beta Clearance, Biomedical Engineering Society Annual Meeting, Orlando, FL, October 2021
17. C Carman-Esparza, **JM Munson**, Investigating Cerebral Location as a Driver of IFF Heterogeneity in Healthy and Tumor-Bearing Mice, Biomedical Engineering Society Annual Meeting, Orlando, FL, October 2021
18. AC Suarez, AJ, K Donaldson, LM Roberts, R De Vita, **JM Munson**, Increased Lymphatic Vessel Density in the Uterus of Past Breeder Mice, Biomedical Engineering Society Annual Meeting, Orlando, FL, October 2021.
19. N Atay, RC Cornelison, JX Yuan, **JM Munson**, The effect of interstitial fluid flow and astrocytes / microglia on invasion, proliferation and stemness of patient-derived glioma stem cells, Society for Neuro-Oncology Annual Meeting, Virtual, November 2020.
20. CM Esparza, LM Roberts, S Kancherla†, RC Cornelison, **JM Munson**, The relationship between interstitial fluid flow and vasculature in murine tumors, BMES Annual Meeting, Virtual, October 2020
21. KT Chatterjee, DA Abler, RC Rockne, **JM Munson**, Magnetic Resonance Imaging And Analysis Of Interstitial Fluid Flow In Preclinical And Clinical Glioblastoma, Summer Biomechanics, Bioengineering and Biotransport Conference, Virtual, June 2020.
22. RC Cornelison, AR Petrosky†, KM Tate, **JM Munson**, Glial Cells React to Heightened Fluid Forces By Upregulating Sphingosine-1-Phosphate Receptor 3, Summer Biomechanics, Bioengineering and Biotransport Conference, Virtual, June 2020.
23. CA Stine, **JM Munson**, Autologous CXCL12 gradient formation around single cells in the glioma microenvironment, Cancer Researchers UK-American Association for Cancer Researchers Joint Conference: Engineering and Physical Sciences in Oncology, London, England, October 2019.
24. AR Petrosky†, RC Cornelison, **JM Munson**, Effect of Interstitial Fluid Flow and Shear Stress on Glial Activation and S1P3 Expression, Biomedical Engineering Society Annual Meeting, Philadelphia, PA, October 2019.
25. CA Esparza, LM Roberts, RC Cornelison, **JM Munson** Changes in Blood Vasculature in response to over-expression of VEGFC in a murine model of glioma, NAVBO, Monterrey, CA, October 2019.
26. KM Tate, RC Cornelison, **JM Munso**n, Investigating S1PR3-mediated glioblastoma invasion mechanisms using 3D hydrogel - tissue model, Society for Neuro-Oncology Annual Meeting, November 2019.
27. **JM Munson,** Interstitial fluid flow in glioma motility and the microenvironment, Gordon Research Conference Physics of Cancer, Galveston, TX, 2019. Poster
28. **JM Munson,** Interstitial fluid flow defines features of the glioma microenvironment, Society for Neuro-oncology Annual Meeting, New Orleans, LA, 2018. Poster
29. RC Cornelison, JX Yuan, KM Kingsmore, CE Brennan†, **JM Munson**, Interstitial flow stimulates glial cells to promote glioma invasion: Implications for glioma therapy, BMES Annual Meeting, Atlanta, USA, 2018. Podium
30. **JM Munson**, SR Peyton, J Field 2D or not 2D: whether to culture MDAMB231 in the third dimension, BMES Annual Meeting, Atlanta, USA, 2018. Poster.
31. S Shim, AR Harris, **JM Munson**, RR Pompano, Microfluidic Device for Two-Way Tumor-Lymph Node Communication, BMES Annual Meeting, Atlanta, USA 2018.

32. CA Stine, KM Kingsmore, **JM Munson**, Design of an adapter for high-throughput interrogation of multiple interstitial flow velocities, BMES Annual Meeting, Atlanta USA 2018.

33. **JM Munson**, KM Kingsmore, Use of MRI to measure and map interstitial fluid flow in the glioma microenvironment: correlation to anatomical and histological features, BMES Annual Meeting, Atlanta, USA 2018.

34. KM Kingsmore, **JM Munson,** Quantifying interstitial fluid flow in glioblastoma using dynamic contrast enhanced MRI, Society for Neuro-oncology Annual Meeting, San Francisco, USA, 2017. Podium and poster.

35. RC Cornelison, JX Yuan, CE Brennan†, **JM Munson**, Shear stress and interstitial fluid flow modulate glial cell-mediated chemotaxis of glioma, Society for Neuro-oncology Annual Meeting, San Francisco, USA, 2017. Poster.

36. **JM Munson**, CMBE Young Innovator Award: Chemoprotection Across the Tumor Border: Cancer Cell Response to Doxorubicin Depends on Stromal Fibroblast Ratios and Interstitial Therapeutic Transport, BMES, Phoenix, USA, 2017. Podium invited.

37. JX Yuan, RC Cornelison, BW Purow, BJ Horton, **JM Munson**, A patient-designed glioblastoma microenvironment model to examine therapeutic response., BMES Phoenix, USA, 2017. Podium.

38. LS Sequeira†, JX Yuan, DK Logsdon, **JM Munson**, Agent-based modeling of the glioblastoma tumor microenvironment, BMES, Phoenix, USA, 2017. Poster, undergraduate.

39. GF Beeghly†, C Thomas†, JX Yuan, AR Harris, **JM Munson**, Engineering patient-driven models to examine breast cancer cell behavior after metastasis to the brain, BMES, Phoenix, USA, 2017. Poster, undergraduate.

40. **JM Munson**, Tissue engineered models for therapeutic testing, Virginia Nanosymposium, Charlottesville, USA, 2017. Oral Presentation.

41. RC Cornelison, JX Yuan, BJ Horton, **JM Munson**, Glial cell analysis in the brain tumor microenvironment elucidates contributions to glioblastoma patient progression, Summer Biomechanics, Bioengineering, and Biotransport Conference, Tucson, USA, 2017. Podium.

42. **JM Munson**, Rita Schaffer Award: Interstitial flow in the glioma microenvironment, BMES, Minneapolis, USA, 2016

43. RC Cornelison, KM Kingsmore, CE Brennan†, **JM Munson,** Invasion of GL261 Cancer Cells In Vivo is Regulated by Interstitial Flow and Depends on CXCR4 Signaling, BMES, Minneapolis, USA, 2016. Poster

44. MJ Perez, JV Cross, **JM Munson**, Flow Response of Myeloid-Derived Suppressor Cells in the Breast Tumor Microenvironment, BMES, Minneapolis, USA, 2016.

45. JX Yuan**, JM Munson,** Recapitulating the glioblastoma tumor microenvironment in a physiologically-relevant in vitro model, EACR Goodbye Flat Biology, Berlin, Germany, 2016, Poster. *Top rated abstract.*

46. KM Kingsmore, **JM Munson**, Interstitial flow increases patient-derived glioma stem cell invasion via CXCR4, CXCL12, and CD44-mediated mechanisms in distinctive cell populations, AACR-Engineering and Physical Sciences in Oncology, Boston, 2016, Poster.

47. RC Cornelison, KM Kingsmore, JX Yuan, BW Purow, **JM Munson**, Interactions of interstitial flow with the glioma microenvironment, Central Virginia Society for Neuroscience Meeting, Charlottesville, USA, 2016

48. AR Harris, **JM Munson,** Lymphatics in triple-negative breast cancer: contribution to chemotherapeutic efficacy in vitro and in vivo, AACR-Tumor Microenvironment Meeting, San Diego, CA, 2016. Poster

49. JX Yuan, KM Kingsmore, AS Berr†, **JM Munson,** Use of a patient-derived 3D glioblastoma model to assess the effect of microenvironmental factors on cancer invasion and response to radiotherapy, Biomedical Engineering Society Annual Meeting, Tampa, USA, 2015. Poster

50. KM Kingsmore, SX Cui, FH Epstein, **JM Munson**, Role of Interstitial Flow in Glioma Microenvironment as Assessed by Dynamic Contrast Enhanced MRI, Biomedical Engineering Society Annual Meeting, Tampa, USA, 2015. Poster

51. JX Yuan, FF Bafakih, BW Purow, **JM Munson**, Rational design of a 3D brain cancer model, Biomedical Engineering Society Annual Meeting, Tampa, USA, 2015. Podium Presentation

52. KM Kingsmore, JX Yuan, **JM Munson**, Interstitial flow and invasion response of human glioma stem cells in a physiologically relevant microenvironment. Beatson International Cancer Conference, Glasgow, UK, 2015. Oral presentation and poster

53. **JM Munson**, MAS Broggi IM Van Mier, MA Swartz, Lymphatic induced stromal activation identified in a 3D in vitro co-culture breast cancer model translates to similar findings in vivo using mouse models, Biomedical Engineering Society Annual Meeting, Tampa, 2015. Podium Presentation

54. JX Yuan, FF Bafakih, JW Mandell, **JM Munson**, Features of the cellular and extracellular microenvironment correlate with glioblastoma patient survival, American Association of Neuro-pathologists Annual Meeting, Denver, USA, 2015. Poster
55. AS Berr†, OC Cossio†, **JM Munson** Glioma Stem Cells Respond Differentially to Treatment in Tissue Engineered Brain Tumor Microenvironments. Biomedical Engineering Society Annual Meeting, San Antonio, USA, 2014. Poster
56. **JM Munson** Lymphatics and interstitial flow involvement in stromal activation: implications for therapy, World Congress of Biomechanics, Boston, MA, USA, 2014. Podium Presentation

Pre-2014

57. **JM Munson,** MA Swartz, Cancer lymphangiogenesis contributes to fibroblast activation via TGFβ production by lymphatics, Beatson International Cancer Conference, Glasgow, Scotland, 2013. Podium presentation
58. **JM Munson**, MA Swartz, Lymphatic endothelial cell-induced stromal stiffening caused by activation of fibroblasts in the tumor microenvironment, Cold Spring Harbor Asia/International Cancer Microenvironment Society Joint Conference on Tumor Microenvironment, Suzhou, China, 2012. Poster
59. **JM Munson,** VC Weaver, MA Swartz, Immunomodulation by biomechanical factors of the tumor stroma, Biomedical Engineering Society Annual Meeting, Atlanta, GA, 2012. Poster
60. T MacDonald, J Liu, **JM Munson**, J Park, K Wang, B Fei, R Bellamkonda, J Arbiser, The application of nanoparticle liposome-imipramine blue in the treatment of medulloblastoma in the SmoA1 transgenic mice, Society for Neuro-oncology Annual Meeting, Toronto, ON 2012. (Published in *Neuro-oncology* **14(s1):**i82-i105). Poster
61. **JM Munson**, RK Khan, JL Arbiser, RV Bellamkonda, Imipramine Blue-Doxorubicin Co-Loaded Nanoparticles Increase Survival In Glioblastoma Over Doxorubicin Alone In a Single Treatment, American Institute of Chemical Engineers National Meeting, Minneapolis, MN 2011.
62. **JM Munson**, RV Bellamkonda, MA Swartz, Interstitial flow increases glioma cell migration via CXCR4/CXCL12 mediated autologous chemotaxis, American Institute of Chemical Engineers National Meeting, Minneapolis, MN, 2011.
63. **JM Munson**, RK Khan, SA Alkindi, RV Bellamkonda, Treatment of glioblastoma with co-loaded nanocarriers yields increased survival, Biomedical Engineering Society Annual Meeting, Hartford, CT, 2011.
64. **JM Munson**, R Machaidze, M Kaluzova, R Bellamkonda, CG Hadjipanayis, Use of doxorubicin and doxorubicin/imipramine blue coloaded nanoparticles yields survival in aggressive human glioblastoma in mice, Society for Neuro-oncology Annual Meeting, Anaheim, CA 2011. (Published in *Neuro-oncology* **13**:S3, CB-45)
65. BT Roller, **JM Munson**, B Brahma, RV Bellamkonda, Nanocarrier encapsulated visible dye for intraoperative brain tumor border delineation in an invasive glioblastoma model, Pediatric Technology & Surgery Research Forum Atlanta, GA, 2011
66. **JM Munson**, L Fried, JL Arbiser, RV Bellamkonda, Novel nano-encapsulated compound, Imipramine Blue, halts brain tumor invasion in vitro and in vivo, Georgia Life Science Summit, Atlanta, GA 2010.
67. **JM Munson**, U Haessler, RV Bellamkonda, MA Swartz, Interstitial fluid flow increases glioma invasion via a CXCR4-dependent mechanism, Society for Neuroscience Annual Meeting, San Diego, CA 2010.
68. **JM Munson**, JA Arbiser, RV Bellamkonda Liposome-encapsulated Imipramine Blue halts glioma invasion *in vivo,* Biomedical Engineering Society Annual Meeting, Austin, TX 2010.
69. **JM Munson**, L Fried, JA Arbiser, RV Bellamkonda Novel nanoparticle-delivered compound, Imipramine Blue, halts glioma invasion by affecting actin dynamics, American Assoc. for Cancer Researchers Annual Meeting, Washington, DC 2010.
70. **JM Munson**, E De Hitta, RK Khan, L Fried, JA Arbiser, RV Bellamkonda Nanocarriers for treatment of invasive glioma, Society for Biomaterials Annual Meeting, San Antonio, TX 2009.
71. **JM Munson**, W Hsu, Characterization of TubeSpin system for CHO culture, American Institute of Chemical Engineers National Meeting, San Francisco, CA 2006.

MEDIA COVERAGE

- "Fralin Biomedical Research Institute scientist to chair premier cancer conference" VTNews 2/2023

- "Virginia Tech researcher's 3D model of brain tumor environment could aid personalized treatment" VTNews, 8/2022
- "New study may inform chemotherapy approaches for breast cancer" VTNews, 8/2022
- "Tissue Engineering Career Conversations" Podcast 4/2022
- "Virginia Tech, Temple University scientists awarded grant to research lipedema, an under-studied disease of fat tissues" VTNews, 1/2022
- "Meet Jenny Munson, a cancer scientist at the Fralin Biomedical Research Institute" VTNews, 12/2021
- "Keeping the machine well-oiled" With Good Reason Podcast, October 2021.
- "Ivy Foundation grant aids Fralin Biomedical Research Institute scientist's search for treatment for deadly brain cancer" VTNews, 9/2021
- "Virginia Tech scientists see fluid flow as potential key to fight Alzheimer's disease" VTNews, 5/2021
- "Scientists from Virginia Tech, City of Hope aim to improve therapy for deadly brain cancer" VTNews, 4/2021
- "Tracking fluid flow in tumors, tissues drives new Fralin Biomedical Research Institute at VTC scientist" VTNews, 1/2021
- "Meet our Scientists: Dr. Farris, Dr. Johnstone, Dr. LaMantia, Dr. Montague, Dr. Shin, and Dr. Munson" VTNews, 1/2021
- "Virginia Tech scientists, engineers to talk about steps to stop cancer in virtual public session" VTNews, 11/2020.
- "Fluid flow in the brain: sorting the good and the bad" VTNews, 9/2020
- "Researcher receives NIH grant to study noninvasive treatment for metastatic breast tumors" VTNews, 8/2020
- "UVA Team wins $3.4 million NIH grant to develop mini-lymph node model" UVAToday 10/2019
- "Using microfluidic chips to study flow in the brain" VTNews, 8/2018
- "Collaborative grant takes on brain cancer cell invasion" VTNews 1/2018
    - NPR Affiliate Roanoke: link
- "Study identifies possible treatment target for Alzheimer's, age-related cognitive decline" VTNews, 7/2018.
- "A First Look at Interstitial Fluid Flow in the Brain" American Institute of Physics, 7/2018.
- "Potential new treatment for deadliest brain diseases" NPR Affiliate Roanoke: link

TEACHING AND MENTORSHIP

COURSES

- **Instructor:** Frontiers in Physical Oncology, Fall 2023
- **Group Leader:** Translational Biology Medicine and Health Grant Preparation Course, Spring 2023
- **Guest Lecturer:** Fundamentals in Cancer Engineering, Spring 2023
- **Advisor:** Biomedical Engineering Senior Design (3 students)
- **Co-Advisor:** Special project Assessing Inclusion in the BME Department (6 students)
- **Guest Lecturer:** Experimental Neuroscience, Spring 2019-Spring 2021
- **Guest Moderator:** Introduction to Biomedical Engineering Design, Fall 2019-2020
- **Instructor:** Graduate Seminar, Virginia Tech, Fall 2018-Spring 2020
- **Instructor:** Advanced Biological Transport, Virginia Tech, Fall 2018
- **Instructor:** Biotransport, University of Virginia, Spring 2017
- **Co-Instructor:** Integrative Design and Experimental Analysis Lab, University of Virginia, Spring 2015, 2016
- **Instructor:** Tissue Engineering, University of Virginia, Spring 2014, 2015, Fall 2016
- **Instructor:** Current Topics in Cancer Bioengineering, EPFL, School of life sciences, Spring 2013
- **Co-Instructor:** Intro to Chemical Processes, Georgia Tech, School of Chemical & Biomolecular Engineering, Spring 2011

PEDAGOGY

- **Attendee:** Course Design Institute, Teaching Resource Center, University of Virginia, June 2014
- **Tech to Teaching Certificate,** Center for enhancement of teaching and learning, Georgia Tech, 2011
- **Attendee:** Graduate Research Groups NSF-Sponsored Workshop, Arlington, VA, 2011
- **JM Munson**, LJ Taite, C Sievers, Technical writing as a tool to promote conceptual understanding, American Institute of Chemical Engineers National Meeting, Minneapolis, MN 2011.

UNDERGRADUATE STUDENT RESEARCHERS MENTORED

VIRGINIA TECH

- **Mentor:** Capstone Senior Design
    - **3D cell culture model device:** Kate Herrema, Spencer Massey, Laith Al-Jouani
- **Mentor:** Special project on assessing diversity in BEAM
    - Kate Herrema, Achutha Kumar, Jenna Sims, Abigail Bock, Samantha Haynes
- **c/o 2018:** Steven Tom
- **c/o 2020:** Alexis Petrosky
- **c/o 2021:** Saloni Bhargava, Conner Brocke, Zehra Demir
- **c/o 2022:** Lauren Pitz, Kate Herrema, Spencer Massey, Hannah Schwenker, Sruthi Kancherla, Ghaidaa Al Khafaji
- **c/o 2023:** Kaylie Maglicmot, Geo Umeadi, Shivanie Kodikalla, Samantha Haynes, Daniel McWilliams, Sarah Krishnamoorthy, Lindsy Stamenkovich
- **c/o 2024:** Adam Klumpp, Caroline O'Brien, Louna Abdalla
- **Visiting:** Richard Kline (Bridges to Baccalaureate), Gabryel Conley-Natividad, Beulah Dadala (Biotransport)
- **High school:** Sophie Schumacker, Ainsley Blevins

UNIVERSITY OF VIRGINIA

- **Mentor:** Capstone Senior Design, University of Virginia, 2014-2016 (12 students-5 projects)
- **c/o 2016:** Alexandra Berr (*Harrison Undergraduate Award*), Ossman Cossio, Melissa Skoff
- **c/o 2017:** Samantha Schwager, Nicholas Asby, Maya Singh, Candace Thomas, Garrett Beeghly (*Harrison Undergraduate Award*), Jillian Kirby
- **c/o 2018:** Caroline Brennan, Raju Arabandi
- **c/o 2019:** Nikhith Kalkunte, Elise Hoover, Sebastian Gutierrez, Lynette Sequeira

GRADUATE STUDENT RESEARCHERS MENTORED

VIRGINIA TECH

- **Caleb Stine (2017-2022):** Biomedical Engineering PhD Program
  Interstitial Fluid Flow Magnitude and Its Effect on Glioblastoma Invasion
- **Kinsley Tate (2018-2022):** Biomedical Engineering PhD Program
  The Role of Interstitial Fluid Flow in the Progression of Glioblastoma and Alzheimer's Disease
- **Yamilet Macias-Orihuelas (2020-2022)**: Biomedical Engineering MS Program, New Horizons Scholar
  The Development of a Printable Device with Gravity-Driven Flow for Live Imaging Glioma Stem Cell Motility
- **Conner Brocke (2021-2022):** Biological Systems Engineering, BS/MS Program
  In-Vitro Glioblastoma Treatment Focusing on Convection Enhanced Delivery
- **Savieay Esparza:** Biomedical Engineering PhD Program, New Horizons Scholar
- **Naciye Atay:** Biomedical Engineering PhD Program
- **Cora Esparza:** Biomedical Engineering PhD Program, New Horizons Scholar, NSF Graduate Research Fellow
- **Jenn Hammel:** Biomedical Engineering PhD Program, ICTAS Fellow, New Horizons Scholar
- **Aileen Suarez:** Biomedical Engineering PhD Program, IMSD Fellow, New Horizons Scholar
- **Samantha Howerton**: Translational Biology Medicine and Health PhD Program
- **Joseph Owens:** Translational Biology Medicine and Health PhD Program
- **Sarah Kremer:** Medical Student, VT-Carilion School of Medicine
- **Samantha Hayes:** Biomedical Engineering BS/MS Program
- **Rotation students: Julio Arroyo, Audra Barnes**

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- **Jessica Yuan (2014-2018):** Biomedical Engineering PhD Program, NIH Cancer Center Training Grant
  Tissue-engineered models of the glioblastoma tumor microenvironment
- **Kathryn Kingsmore (2014-2018):** Biomedical Engineering PhD Program, NSF Graduate Research Fellowship

Brain cancer cells go with the flow: the role of interstitial flow in glioblastoma invasion

- **Alexandra Harris, M.S (2014-2018).:** Pathology PhD Program, NIH Biotechnology Training Program
  Understanding the Role of the Lymphatic Vasculature in Chemotherapy and Cancer Progression
- **Daniel Logsdon (2015-2017):** Biomedical Engineering Master's Program
  Agent-Based Models of the Tumor Microenvironment: Predicting Flow-Mediated Invasion and Cancer Viability in Response to Interstitial Flow, Chemotherapy, and Stromal Cell Density

POSTDOCTORAL RESEARCHERS MENTORED

- **R. Chase Cornelison, Ph.D.** (PhD, UT Austin) Current: Assistant Professor UMass-Amherst
- **Krishnashis Chatterjee, Ph.D.** (PhD, Virginia Tech) Current: Research Scientist, Univ Pittsburgh
- **LaDeidra Monet Roberts, Ph.D.** (PhD, Cornell University) Current: Assistant Professor Virginia Tech
- **Peng Jin, Ph.D.** (PhD, Seoul National University)
- **Gabriela Mendes, Ph.D.** (PhD, Texas A&M)

RESEARCH STAFF SUPERVISED

- **Sharon K Michelhaugh, Ph.D.** Research Scientist
- **Jessica Cunningham, Ph.D.** Research Scientist
- **Yanping Liang,** Research Associate
- **Emily Walker (2021)** Lab manager

OTHER MENTEES

- **Olivia Turk,** PREP Program Scholar, 2020-2021
- **Sophia Schumaecker,** Roanoke Governor's School (High school), 2022-2023

See where lab alumni are now

SERVICE AND LEADERSHIP

FIELD

- **2023- :** Virginia Commonwealth Cancer Conference, Virginia Tech Representative
- **2023-:** Editorial Board, Progress in Biomedical Engineering
- **2023**: Co-chair, Gordon Research Conference on Physical Sciences in Cancer
- **2022:** Tumor Microenvironment study section, NIH, Ad hoc member
- **2022:** Owen Locke Foundation Grant Reviewer
- **2022:** Tumor Microenvironment study section, NIH, Mail reviewer
- **2022:** North American Vascular Biology Organization "Lessons Learned" blogpost
- **2022:** North American Vascular Biology Organization "Lab of the Month" feature
- **2021:** Guest editor, Bioengineering in Women's Health, Annals of Biomedical Engineering
- **2021:** Track Chair, Women's Health Engineering, Biomedical Engineering Society Annual Meeting
- **2021-present:** Biomedical Engineering Council of Diversity Member
- **2020-2021:** Secretary, Biomedical Engineering Council of Diversity Steering Committee
- **2020-present:** Associate Editor, Annals of Biomedical Engineering
- **2019:** Co-chair special session on Bioengineering in Women's Health, BMES Annual Meeting, Philadelphia, PA
- **2019-2021**: Junior Editor, Cells Tissues and Organs
- **2018-Present:** BMES Awards Committee Member
- **2018:** Co-organizer, Mid-Atlantic Biomanufacturing Symposium, Charlottesville, VA
- **2016-2017:** Integrated Molecular Analysis Technologies Study Section, National Cancer Institute
- **2016:** Session chair, Cellular motility, Biomedical Engineering Society
- **2015-2017:** Session chair, Cancer Technologies, Biomedical Engineering Society
- **2015-2017:** Session chair, Tissue engineering, Biomedical Engineering Society
- **2014-2016:** Biomedical Engineering Society Annual Meeting Abstract Reviewer

- **2014-2017:** National Science Foundation Graduate Research Fellowship Reviewer
- **Reviewer for:** Cancer Research, Journal of Controlled Release, Integrative Biology, Molecular Cancer Therapeutics, Applied Physiology, Biochemical Engineering Journal, Biotechnology and Bioengineering, PLoSONE, Journal of Biomechanics, Trends in Biotechnology, Breast Cancer Research, Neuroscience, Breast Cancer Research, Science Advances

UNIVERSITY/DEPARTMENTAL

VIRGINIA TECH

- **2022-Present:** Biomedical Engineering & Mechanics New Faculty Grant Writing Group
- **2022-Present:** Virginia Tech Wake Forest School of Biomedical Engineering and Sciences Graduate Program Committee Member
- **2022-2023:** Biomaterials and Biointerfaces Search Committee
- **2022-2023:** Brain Cancer Faculty Search Committee for Children's National appointment
- **2021-2022:** Brain Cancer Faculty Search Committee for Children's National appointment
- **2021-Present:** Co-director, Virginia Tech Cancer Research Alliance
- **2021-Present:** Postdoctoral Committee at FBRI
- **2020-Present:** Associate Director, Small bore preclinical Imaging Facility, Fralin Biomedical Research Institute
    - Hired Director of facility, Dr. Maosen Wang.
    - Oversee the scientific mission and community use of 9.4T Bruker MRI/PET and Bruker MicroCT/PET
    - Responsible for maintaining protocols and compliance of facility for animal and biohazard work
- **2020:** National Science Foundation Graduate Research Fellowship Workshop Organizer
    - Developed materials to coach students through the NSF Application
    - Hosted and led workshops to discuss the application's individual parts
    - Organized internal faculty reviewers for applicants
- **2020:** Subgroup leader, Diversity and Inclusion, Fralin Biomedical Research Institute
- **2020:** Cardiovascular Research Search Committee, Fralin Biomedical Research Institute
- **2019-2021:** Chair, Inclusion and Diversity Committee, Biomedical Engineering & Mechanics
- **2019-2021:** Member, Undergraduate Curriculum Committee, Biomedical Engineering & Mechanics
- **2019-2021:** Member, College of Engineering Inclusion and Diversity Committee
- **2019-2021:** Group Leader, Cancer Bioengineering, Center for Engineered Health, ICTAS
- **2018:** Invited speaker seminar series organizer
- **2018:** CIMER Training for Graduate Mentorship (www.cimerproject.org)
- **2018:** Diversity Ally Certificate, Virginia Tech Human Resources and Professional Development
- **2018:** Women's welcome weekend attendee for recruitment
- **2018:** Student Transition Engineering Program Faculty Attendee (new student lunches)
- **2018:** Biomechanics and Biotransport summer research experience for undergraduates faculty mentor
- **2018:** Co-organizer, Center for Engineered Health Virginia Nanosymposium
- **2017:** Graduate Brown Bag Lunch Seminar, Biomedical Engineering
- **2017:** NSF Graduate Research Program Tips and Tricks, School of Engineering Seminar
- **2017-Present:** Cancer Journal Club, Biomedical Engineering & Mechanics

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- **2016-2017:** Undergraduate curriculum committee
- **2015-2016:** Biotechnology Training Grant Faculty Coordinator Student Seminar Series
- **2015/16:** Faculty Search Committee, Cross-departmental Biomaterials
- **2014/15:** Faculty Search Committee, Biomedical Engineering
- **2013/14:** Graduate Admissions Committee, Biomedical Engineering
- **2014:** Strategic hiring initiative committee, Biomedical Engineering
- **2014-2017:** Judge Biomedical Sciences Poster Symposium, Huskey Graduate Symposium, Undergraduate Research Network Poster Session

COMMUNITY AND ALUMNI OUTREACH

- **President's State of the University Address,** Virginia Tech, January 2023
- **Ut Prosim Dinner,** Virginia Tech, April 2022
- **Sesquicentennial Hokietalks,** Virginia Tech, February 2022. Link.
- **KidsTech University,** Virginia Tech, January 2019
- **High School Outreach,** December 2018
- **Virginia Tech Science Festival,** Virginia Tech, October 2018
- **Roanoke STEAM Day**, City of Roanoke , September 2018
- **Biotechnology Educators Conference** Speaker (2018), Virginia Tech
- **TECHGirls** participant (2014-2017), University of Virginia
- **Society for Women Engineers** high school day speaker (2015-2017), University of Virginia
- Outreach activities developed and catalogued on our website.

THESIS COMMITTEES

VIRGINIA TECH-WAKE FOREST

- **Kandace Donaldson** (Advisor: Raffaella De Vita) Biomedical Engineering PhD Program
- **Michelle Dickerson White** (Advisor: Pam Vandevord) Biomedical Engineering PhD Program
- **Maruf Hoque** (Advisor: John Chappell) TBMH Graduate Program
- **Zerin Khan** (Advisor: Scott Verbridge) Biomedical Engineering PhD Program
- **Joelle Martin** (Advisor: Harry Sontheimer) TBMH Graduate Program, Completed 2020
- **Nastaran Alinezhadbalalami** (Advisor: Scott Verbridge) TBMH PhD Program, Completed 2021
- **Nora Hlavac (**Advisor: Pam Vandevord) Biomedical Engineering PhD Program, Completed 2018
- **Shiny Rajan** (Advisor: Adam Hall/Alex Skardal) Biomedical Engineering PhD Program, Completed 2019

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- **Sameer Bajikar** (Advisor: Kevin Janes) Biomedical Engineering PhD Program, Completed 2016
- **Angela Zeigler** (Advisor: Jeff Saucerman) Biomedical Engineering MD/PhD, Completed 2017
- **Molly Kelly-Goss** (Advisor: Shayn Peirce-Cottler) Biomedical Engineering PhD Program, Completed 2018
- **Howard Clifton Ray** (Advisor: Paul Yates) Biomedical Engineering PhD Program, Completed 2018
- **Colleen Curley** (Advisor: Richard Price) Biomedical Engineering PhD Program, Completed 2019
- **Bruce Corliss** (Advisor: Shayn Peirce-Cottler) Biomedical Engineering PhD Program, Completed 2019
- **Natasha Sheybani** (Advisor: Rich Price) Biomedical Engineering PhD Program, Completed 2020
- **Jennifer Ortiz** (Advisor: Rebecca Pompano) Chemistry PhD Program, Completed 2021

CONSULTING AND EXTERNAL BUSINESS

- Co-Founder, **Cairina Inc.**
- Consultant, **Cadre Pharmaceuticals**

PROFESSIONAL AFFILIATIONS AND ACTIVITIES

SOCIETY MEMBERSHIPS

Society for Neuro-Oncology
American Association of Cancer Researchers
North American Vascular Biology Organization
Biomedical Engineering Society
Tau Beta Pi
Omega Chi Epsilon

OTHER TRAININGS AND WORKSHOPS ATTENDED

Introductory Course in Laboratory Animal Science, Lausanne Switzerland, EPFL, 2012 (80 hours)

Diversity Ally Certificate, Virginia Tech, January 2019 (30 hours)
Responsible Conduct of Research Series (20 hours)
CITI training for human subjects research