Service to professional societies:

I am an active member of the Biomedical Engineering Society. I have and continue to review conference abstracts every year, and I chaired the following sessions: Cancer mechanobiology, 3D Molecular and Immunoengineering, and 3D cellular engineering models. I also reviewed Chapter Development Reports (CDR) last year.

Since 2022, I became the chair for our VCU departmental booth at the BMES conference to increase VCU's presence and recruitment efforts. There were many behind-the-scenes logistics I took care of leading up to the event: First, I compiled all logistics and wrote a protocol (including timeline) of things to do in advance of the event. Second, I learned from the College of Engineering Graduate Program Director how to successfully recruit prospective students (i.e. swag items, booth management, etc), and recruited the Biomedical Engineering Graduate Student Council (BGSC) to develop recruitment training material for future students. Third, I worked with our marketing department to generate a library of brand-new marketing materials (life-size banners, postcard ads, pamphlets, digital ads and presentations, etc) that are still used at BMES today as well as our department-related recruiting events. Other departments were so impressed that they now use our materials as models when generating their own materials. During BMES, I set up a schedule for graduate students and faculty to speak with perspective students. I worked out logistics to bring administrative support for 24-7 booth coverage and marketing personnel to provide live conference coverage (i.e. social media, news stories). Finally, I organized a VCU networking banquet for all current, prospective VCU students and alumni. Students reflected that the event helped them broaden their network within VCU and in the larger BME community. I continue to chair the BME booth; every year, based on student feedback, I strive to improve the booth and elevate our presence at BMES. For example, this year, students suggested more alumni engagement, so we are working with our alumni office to generate events at BMES 2025.

Outside of Biomedical Engineering, I was invited to chair the "Microfluidics in Leader Cell Driven Collective Migration" Session at the Annual Association for Cancer Research Conference (AACR 2023). I also review abstracts for the Summer Biotransport, Biomechanics, and Bioengineering (SB3C) Conference (Masters and PhD). Finally, I am the chair-elect for the Biophysical Society Bioengineering sub-group.

Why I want to serve on the CMBE SIG and my vision for the SIG:

As a graduate student, I received a graduate student travel award from the CMBE, and recently as a young investigator, I received a Rising Star award. When I received the graduate student award, that gave me the confidence to pursue my passion in CMBE-research. As a young investigator, the Rising Star award helped me expand my network and provided an amazing platform to share my research. I am currently contributing to the Perspectives Piece from the conference in the sub-topic of "Mechanobiology". As these awards have been instrumental for my success, I want to give back. I want to make an impact not only by helping advance research in the field, but also to help elevate and recruit the next generation of researchers in the CMBE field. I love the vision of the CMBE, and I am so inspired by the successes of prior leadership to not only advance novel and high-impact science, but also elevate the next generation to success.

I am committed to keeping this vision and also expanding it. I want to help plan future conferences where we can continue to bring together researchers while also having even more trainee engagement. One area I would love for the SIG to expand is in the space of community engagement. This past year, a key theme of the SIG was "mechanomedicine" – how do we link mechanobiology to medicine? To further this impact, we must incorporate the community: whether that includes more clinicians, or patients with lived-in experience to bring the "real-world" perspective, or even outreach to K-12. To do this, we could have a special session at the conference where community members can provide feedback about ongoing research in mechanomedicine. This can generate new collaborations, and a longer reach goal could be for the SIG to provide "micro-grants" to foster these relationships or support outreach measures to K-12 with focus in mechanobiology.

PRISCILLA Y HWANG

Assistant Professor
Virginia Commonwealth University
Department of Biomedical Engineering

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General Research Interests

- **Cell Mechanobiology:** Investigating how cell-cell and cell-matrix interactions drive disease progression
- **3D Microphysiological Systems:** Design biomimetic systems to study microenvironmental features that contribute to cellular activity in healthy and diseased states
- **Biomaterials:** Development and evaluation of novel materials that can provide biochemical and biophysical signals for cell-based tissue repair

Professional Experience

Tenure Track Assistant Professor, *Virginia Commonwealth University*
Biomedical Engineering
(November 2019- Present)
Associate Member, *Massey Comprehensive Cancer Center*
Member, *VCU Institute of Molecular Medicine*

Postdoctoral Research Fellow, *Washington University in St Louis*
(August 2015- August 2019)
Mentor: Drs. Gregory Longmore and Steven C George

Education

Doctor of Philosophy with Certificate in College Teaching, Duke University, 2015
Biomedical Engineering
Thesis Title: *Cadherin-mediated cell-cell interactions regulates phenotype and morphology of nucleus pulposus cells of the intervertebral disc*
Mentor: Dr. Lori A. Setton

Masters of Science, Biomedical Engineering, Duke University, 2012

Bachelors of Science, Biomedical and Electrical Engineering, Duke University, 2008

Honors and Awards

Rising Star, Cellular and Molecular Bioengineering, Biomedical Engineering Society 2025
Early Career Award, Massey Comprehensive Cancer Center, VCU 2024
VCU National/International Research Award, VCU 2023
NSF CAREER Award, NSF BMMB 2022
Best Talk and Poster Award, NCI CSBC/PS-ON/BD-STEP Junior Investigator Meeting 2020
Fox2 Interview, American Cancer Society, St Louis MO 2018
Invited Expert Panelist, American Cancer Society Cancer Action Network (CAN) Cancer Talks, St Louis MO 2018

Invited Research Speaker, American Cancer Society Making Strides for Breast Cancer, St Louis MO 2018
Best Poster Award, Breast Cancer Research Program (BCRP) Forum, St Louis MO 2017
Graduate Student Award, Cell and Molecular Bioengineering Conference, US Virgin Islands 2015
Best Poster Award in Cell Mechanobiology, 2nd International Spine Research Symposium, Philadelphia PA 2013
Chordoma Foundation Travel Scholarship 2011
Best Poster Award, Duke Biomedical Engineering Department Retreat 2011
Graduation with Distinction, Duke University 2008
Pratt School of Engineering M.U.S.I.C. Teaching Fellowship, Duke University 2005
IBM Corp Watson Scholarship (4-year award) 2004

Associated awards presented to my colleagues for our collaborative work:
William H. Sweet Award (AANS Pain Section, presented to MF Shamji, MD, PhD) 2011
Mayfield Basic Science Award (AANS Spine Section, presented to MF Shamji, MD, PhD) 2011

Research Support

NIH NIGMS R35 7/1/2024-7/1/2029
Dissecting mechanisms of collective migration
In this proposal we investigate what are leader cells, leader cell mechanics and function, and mechanisms driving collective migration in developmental processes such as tubulogenesis. The major goals of this proposal are: 1. to investigate the relationship between ECM biomechanical cues and leader cell development that govern collective migration, 2. To investigate leader cell dynamic mechanoreceptors governing collective migration, and 3. To understand how cell junction forces and cell matrix interactions communicate to effect migration.
Role: PI

NIH NCI R01 8/1/2024-8/1/2029
Modulating growth, progression and metastasis in breast cancer by inhibiting MDA-9
The major goals of this proposal are to understand how MDA-9/CXCL5 signaling regulates cell migration of breast cancer cells and elucidate MDA-9/CXCL5 as a potential therapeutic target for treatment of breast cancer
Role: co-I

NSF REU 5/2024-5/2027
REU in Mechanobiology
This grant provides research opportunities for undergraduate students to spend 10 weeks over the summer engaged in a research project in the field of mechanobiology.
Role: co-PI

NSF CAREER 2/1/2022-2/1/2027
CAREER: Biomechanics of leader cells
This grant will investigate the mechanobiology regulating leader cell interactions with the extracellular matrix as well as other cells within a cluster during collective migration
Role: PI

NIH NCI R01 5/2022-5/2027
Leader cell development and function in breast tumor collective migration
This grant will investigate cellular signaling pathways regulating leader cell protrusions effecting breast cancer metastasis
Role: Consortium Agreement with Washington University in St Louis

American Cancer Society, Theorylab Collaborative Grant 1/1/2022-12/31/2022

Dissection of immune cell effects on tumor cell behavior
This grant provides pilot funding, in collaboration with Dr Paula Bos (VCU, pathology) to understand how immune cells modulate the tumor microenvironment, which regulates collective cell migration
Role: co-PI

VCU Presidential Research Quest Fund (PeRQ) 7/1/2021-12/1/2022
Investigating the mechanical coupling of leader and follower cells to drive collective cell migration
This grant provides pilot funding to quantify mechanical forces between leader and follower cells during collective migration
Role: PI

American Cancer Society Institutional Research Grant 10/1/2020-10/1/2021
Cadherin-3 regulated leader cell driven collective migration
This grant provides pilot funding to investigate how Cadherin-3 positive leader cells regulate collective cell migration
Role: PI

Post-doctoral Research Support
Post-doctoral Research Fellow, American Cancer Society 2018-2019
Microenvironment cues alter leader cell development in collective migration
Role: PI; Mentor: Gregory Longmore and Steven George

Post-doctoral Research Fellow, WM Keck Foundation 2017-2018
Developing microfluidic models to investigate features of collective migration
Role: PI; Mentor: Gregory Longmore and Steven George

Pre-doctoral Research Support
Graduate Research Fellow**,** National Science Foundation (NSF GRFP) 2012-2015
Extracellular matrix (ECM) proteins and substrate stiffness may regulate cell survival and metabolism of the bone tumor-forming cancer, Chordoma
Role: PI; Mentor: Lori A Setton

Graduate Fellow, Morton Friedman Fellowship, Duke University 2011-2012
Corresponding changes in midbrain pain receptor expression, gait and behavioral sensitivity in an autologous nucleus pulposus model of radiculopathy
Role: PI; Mentor: Lori A Setton

Whitaker International Fellow, Whitaker Foundation 2008-2009
Development of ex vivo culture method to study endplate ossification
Role: PI; Mentor: Keita Ito

Undergraduate Research Support
Pratt Research Fellow, Pratt School of Engineering, Duke University 2006-2008
Development of injectable chitosan hydrogel formulations for local drug delivery of anti-TNF therapeutics
Role: PI; Mentor: Lori A Setton and Mohammed Shamji

Peer-Reviewed Full-Length Publications

Leonard CE, Lichtenberg JY, Rolston J, Pearson A, **Hwang PY** (2024, *in preparation)* Matrix architecture regulates cell-mediated deformations and cell-matrix interactions to determine collective invasion dynamics of tumor cell clusters. APL Bioengineering

Garcia-Santillan A, Lichtenberg JY, Shen H, Rodriguez J, Barra-Carrasco J, Clark N, Du W, Martinez L, Hadjis A, Caliccia T, Dozmorov M, Bravo-Cordero JJ, Olex A, **Hwang PY**, Bos PD (2024, *under review*) Regulatory T cells contribute to tumor cell dissemination by extracellular matrix remodeling. *Cell Reports*

Morikis V, Avila D, DiMauro A, Cao Y, **Hwang PY**, Pathak A, Longmore GD (2024, *under review*) Cadherin mediated cohesivity at the leader-follower boundary is important for collective migration. *Journal of Cell Biology*

Williamson J, McKean J, Friedman M, Donahue H, **Hwang PY** (2025, *under review*) Genetic variability and sex affect the response of skeletal muscle to extended immobilization. *Journal of Applied Physiology*

Tran S, Lichtenberg JY, Leonard CE Sterling HR, Panek GK, Pearson AH, Lopez S, Lemmon CA, Conway DE, **Hwang PY** (2025) P-cadherin dependent adhesions are required for single lumen formation and HGF-mediated cell protrusions during epithelial morphogenesis. *iScience*

Lodi MK, Lodi M, Osei K, Ranganathan V, **Hwang PY**, Ghosh P (2024) CHAI: Consensus clustering through similarity matrix integration for cell-type identification. *Briefings in Bioinformatics*

Lichtenberg JY*, Leonard CE*, Sterling HR, Santos Agreda V, **Hwang PY** (2024) Using microfluidics to align matrix architecture and generate chemokine gradients promotes directional branching in a model of epithelial morphogenesis. *ACS Biomaterials Science and Engineering*
*co-first author

Lichtenberg JY, Ramamurthy E, Young AD, Redman TP, Leonard CE, Das SK, Fisher PB, Lemmon CA, **Hwang PY** (2024) Leader cells mechanically respond to aligned collagen architecture to direct collective migration. *PLoS One*

Lichtenberg JY, Tran S, **Hwang PY** (2023) Mechanical Regulation of Tumor Progression. *Advances in Cancer Research*

Hwang PY, Mathur J, Cao Y, Almeida J, Ye J, Morikis V, Cornish D, Clarke M, Stewart S, Pathak A, Longmore GD. (2023) A Cdh3-β-Catenin-Laminin signaling axis by a subset of breast tumor leader cells control leader cell polarization and directional collective migration. *Developmental Cell*

Humphries BA, **Hwang PY,** Kendrick AA, Kulkarni RP, Pozzar RA, San Martin R (2021). Overstretched and overlooked: solving challenges faced by early-career investigators after the pandemic. *Trends in Cancer*, DOI: https://doi.org/10.1016/j.trecan.2021.07.005

Barcus, CE, **Hwang PY**, Morikis V, Brenot A, Pence P, Clarke M, Longmore GD (2021). Tyrosine kinase independent actions of DDR2 in tumor cells and CAFs influence tumor invasion, migration, and metastasis. *Journal of Cell Science*, DOI: 10.1242/jcs.258431

Bayer SV, Grither WR, Brenot A, **Hwang PY**, Barcus CE, Ernst M, Pence P, Walter C, Pathak A, Longmore GD (2019**)** DDR2 controls breast tumor stiffness and metastasis by regulating integrin mediated mechanotransduction in CAFs. *Elife*.

Hwang PY, Brenot A, King AC, Longmore GD*, George SC* (2019). Microenvironmental cues stimulate migration and polarization of K14+ cells to guide collective migration. *Cancer Research*

Shirure VS, Sewell-Loftin MK, Lam SF, Todd TD, **Hwang PY**, George SC (2016, book chapter). Building better tumor models: organoid systems to investigate angiogenesis. *Cancer Drug Discovery and Development: Tumor Organoids*

Hwang PY, Jing L, Chen J, Lim FL, Tang R, Choi H, Cheung KM, Risbud MV, Gersbach CA, Guilak F, Leung VY, Setton LA (2016) N-Cadherin is key to expression of the nucleus pulposus cell phenotype under selective substrate culture conditions. *Scientific Reports* 6, 28038

Hwang PY, Jing L, Michael KW, Richardson WJ, Chen J, Setton LA (2015, invited publication) N-cadherin-mediated signaling regulates cell phenotype for nucleus pulposus cells of the intervertebral disc. *J Cellular and Molecular Bioengineering,* 8(1): 51-62; PMCID: 25848407

Hwang PY, Chen J, Jing L, Hoffman BD, Setton LA (2014) The Role of Extracellular Matrix Elasticity and Composition in Regulating the Nucleus Pulposus Cell Phenotype in the Intervertebral Disc: A Narrative Review. *J Biomechanical Engineering*, 136: 021010-1 – 021010-9; DOI: 10.1115/1.4026360

Francisco AT, **Hwang PY**, Jeong CG, Jing L, Chen J, Setton LA (2014) Photocrosslinkable Laminin-Functionalized Polyethylene Glycol Hydrogel for Intervertebral Disc Regeneration. *Acta Biomaterialia*, 10(3): 1102-11. PMCID: 24287160

Hwang PY, Allen KD, Shamji MF, Jing L, Mata BA, Gabr MA, Huebner JL, Kraus VB, Richardson WJ, Setton LA. (2012) Corresponding Changes in Midbrain Pain Receptor Expression, Gait and Behaviorial Sensitivity in an Autologous Nucleus Pulposus Model of Radiculopathy. *Open Orthopaedic Journal*, 6:383-391. PMCID: PMC3434701

Shamji MF, **Hwang P**, Bullock RW, Adams SB, Nettles DL, Setton LA. (2009) Release and Activity of Anti-TNFa Therapeutics from Injectable Chitosan Preparations for Local Drug Delivery. *Journal of Biomedical Materials Research: Part B Applied Biomaterials*, 90(1), 319–26. PMCID: PMC2775925

Adams SB, Shamji MF, Nettles DL, **Hwang P**, Setton LA. (2009) Sustained Release of Antibiotics From Injectable and Thermally Responsive Polypeptide Depots. *Journal of Biomedical Materials Research: Part B Applied Biomaterials*, 90(1), 67-74. PMCID: PMC2694231

Shamji MF, Jing L, Chen J, **Hwang P,** Ghodsizadeh O, Friedman AH, Richardson WJ, Setton LA. (2008) Treatment of Neuroinflammation by Soluble Tumor Necrosis Factor Type II Fused to a Thermally Responsive Carrier: Laboratory Investigation. *Journal of Neurosurgery: Spine*, 9(2): 221-8. PMCID: PMC2746856

Talks and Invited Seminars

*indicates presenter

Hwang PY* (Spring 2025; invited speaker) 2025 Biophysical Society (BPS) Annual Meeting. Los Angeles CA.

Hwang PY* (2024; invited speaker: Early Career Award) *Cancer Biology Retreat*, Massey Comprehensive Cancer Center, Richmond VA

Lichtenberg JY*, Leonard CE, **Hwang PY** (2024; podium) Breast cancer clusters generate greater matrix deformation in aligned fibers during collective migration *Ann Mtg. Biomedical Engineering Society*, Baltimore MD

Williamson J*, Friedman MA, McKean JL, Donahue HJ, **Hwang PY** (2024; podium) Effects of genetic variability on muscle adaptation to mechanical unloading. *Ann Mtg. Biomedical Engineering Society*, Baltimore MD

Tran SK*, Lichtenberg JY, Conway DE, **Hwang PY** (2024; podium) Investigating the role of P-cadherin in acini formation and HGF-induced tubulogenesis. *Ann Mtg. Biomedical Engineering Society*, Baltimore MD

Hwang PY* (2024; invited speaker) Microphysiological systems to interrogate mechanisms of leader cell driven collective invasion. *Research Seminars in Drug Development.* Virginia Commonwealth University, Department of Pharmaceutics

Hwang PY* (2023; invited speaker) Microphysiological systems to study cancer cell migration. *Seminar Series Biomedical Engineering*. University of Virginia, Charlottesville VA

Hwang PY* (2023; *invited podium presentation*) Leader cell biomechanics regulating collective migration. *American Association for Cancer Research*, Orlando FL

Hwang PY* (2023; *invited speaker)* Microphysiological systems to study cancer cell migration. Medical Engineering Conference, George Mason University, Fairfax VA

Hwang PY* (2023; *invited seminar speaker*) Utilizing 3D lab-on-a-chip systems to investigate leader cell driven collective migration in breast cancer. Department of Physiology, Virginia Commonwealth University, Richmond VA.

Lichtenberg JY*, **Hwang PY** (2023; podium) Stromal cells modulate chemo-mechanical factors in the mechanical tumor microenvironment required for leader cell driven collective migration. *Summer Biomechanics, Bioengineering, and Biotransport Conference,* Aspen, CO.

Leonard, C*, Lichtenberg JY, **Hwang PY** (2022) Developing an in vitro model for the study of biomechanical cues in the breast tumor microenvironment. *Ann Mtg. Biomedical Engineering Society*, San Antonio TX

Valladares M*, Lichtenberg JY, Lemmon C, **Hwang PY**. (2021) Investigating traction forces of breast cancer K14+ leader cells *Ann Mtg Biomedical Engineering Society*, Orlando FL

Hwang PY*, Cornish D, Andhey P, King A, Bramel E, Artyomov M, Longmore G (2020). Leader cell heterogeneity in directing collective cell migration. *NCI CSBC/PS-ON/BD-STEP Junior Investigator Meeting*, NIH, Bethesda MD (virtual)

Hwang PY*, Bremel E, Andhey P, King A, Artyomov M, Longmore G (2019). Cell-cell interactions between leader cells and stromal fibroblasts in heterogeneous tumor organoids alter directed collective migration. *Ann Mtg. Biomedical Engineering Society*, Philadelphia PA

Hwang PY*, Brenot A, King A, George S, Longmore G (2018). Leader cells reorganize within tumor organoids to lead directed collective migration. *Ann Mtg. Biomedical Engineering Society*, Atlanta GA

Hwang PY*, Brenot A, King AC, Longmore G, George SC (2017). Tumor Microenvironment Alters Collective Migration. *Midwest Tumor Microenvironment Meeting*, St Louis, MO.

Hwang PY*, Brenot A, Longmore G, George SC (2017). Using Microfluidic Systems to Investigate Directional Tumor Cell Migration. *Cell-to-cell communications in cancer/developmental biology*. St Louis, MO

Hwang PY*, George SC (2016). The Hypoxic Tumor Microenvironment Alters CXCR4 Expression and Collective Cell Migration of Breast Tumor Cells. *Ann Mtg. Biomedical Engineering Society,* Minneapolis, MN.

Hwang PY*, Jing L, Fitch R, Isaacs R, Richardson WJ, Gersbach CA, Chen J, Setton LA (2015). Laminin-functionalized Hydrogels Promote Juvenile Cell Phenotype and Morphology for Nucleus Pulposus Cells of the Intervertebral Disc. *Ann Mtg Biomedical Engineering Society*, Tampa, FL.

Hwang PY*, Jing L, Richardson WJ, Isaac RE, Brown CR, Chen J, Setton LA (2015). N-cadherin-mediated Cell-cell Contacts Regulate Juvenile NP Cell Phenotype on PEG-LM Hydrogels. *Cell and Molecular Bioengineering Conference*, US Virgin Islands

Hwang PY*, Francisco AT, Jing L, Richardson WJ, Isaacs R, Brown C, Chen J, Setton LA (2014). The Use of Laminin-functionalized Hydrogels to Restore Pathological Nucleus Pulposus Cells of the Intervertebral Disc. *Ann Mtg Biomedical Engineering Society*, San Antonio, TX.

Hwang PY*, Jing L, Richardson WJ, Isaacs RE, Michael KW, Chen J, Setton LA (2014). N-cadherin is Key to Regulating Nulceus Pulposus Cell Behaviors on Substrates of Varying Stiffness and Extracellular Matrix Composition. 7th *World Congress of Biomechanics*, Boston, MA.

Hwang PY*, Shamji MF, Jing L, Gabr M, Mata BA, Allen KA, Chen J, Richardson WJ, and Setton LA (2010). Response of pain receptors in the midbrain due to painful radiculopathy. *Ann Mtg Biomedical Engineering Society*, Austin, TX.

Conference Poster Presentations

*indicates presenter

Leonard Corinne, Rolston J, Lichtenberg JY, Tran S, Petry L, and **Hwang PY** (2023) Quantification of CDH3 mediated 3D cell forces using bead tracking technology *Ann Mtg Biomedical Engineering Society,* Seattle WA

Lichtenberg JY, Leonard CE, Redman TP, Das S, Fisher P, and **Hwang PY** (2023) K14+ leader cells use integrin-a2 to promote directed collective migration. *Ann Mtg Biomedical Engineering Society,* Seattle WA

Lichtenberg JY and **Hwang PY**. (2022) Evaluation of breast tumor K14 leader cells polarization in 3D aligned collagen fibers. *Ann Mtg Biomedical Engineering Society*, San Antonio TX

Lopez S, Tran S, Conway DE, **Hwang PY**. (2022) Examining the role of P-cadherin in epithelial collective cell migration *Ann Mtg Biomedical Engineering Society*, San Antonio TX

Redman T, Lichtenberg JY, **Hwang PY**. (2022) K14+ Leader cell and cancer-associated fibroblast interactions control cancer cell migration Annual Meeting of the BMES Society, San Antonio TX

Tran S, Lopez S, Pearson A, Lemmon C, Conway DE, **Hwang PY**. (2022) Investigating P-cadherin mediated traction forces in epithelial collective cell migration *Ann Mtg Biomedical Engineering Society*, San Antonio TX

Ramamurthy E, Lichtenberg JY, Lemmon C, **Hwang PY**. (2022) Investigating traction forces of breast cancer K14+ leader cells in tumor organoids *Ann Mtg Biomedical Engineering Society*, San Antonio TX

Pearson A, Tran S, **Hwang PY**. (2022) Examining the relationship between P-cadherin and the hippo signaling pathway in collective cell migration. *Ann Mtg Biomedical Engineering Society* San Antonio TX

Lichtenberg J, Leonard C, **Hwang PY.** Aligned collogen matrices promote elongation of breast cancer tumor organoids, *Ann Mtg Biomedical Engineering Society*, San Antonio TX

Hwang PY*, Brenot A, King AC, Longmore G, George SC (2017). Tumor Microenvironment Alters Collective Migration of Breast Cancer Cells. *Breast Cancer Research Program*, St Louis MO.
Award for best poster presentation at conference

Hwang PY*, George SC (2017). CXCR4 and Hypoxia Drive Directional Cancer Cell Migration. *Cell and Molecular Bioengineering Conference*, Hawaii

Hwang PY*, Jing L, Bowles RD, Gersbach CA, Chen J, and Setton LA (2015). CDH2 Regulates Juvenile Nucleus Pulposus Cell Phenotype and Morphology. *Philadelphia Spine Research Symposium*, Philadelphia PA.

Hwang PY, Jing L, Richardson WJ, Isaacs RE, Michael KW, Chen J, Setton LA* (2014). N-cadherin-mediated cell signaling in nucleus pulposus cells of the intervertebral disc. *World Forum for Spine Research*, Xi'an China.

Hwang PY*, Francisco AT, Jing L, Richardson WJ, Chen J, Setton LA (2013). Laminin and Collagen Differentially Regulate Cell Cluster Formation and Cellular Biosynthesis for Nucelus Pulposus Cells. *2nd International Spine Research Symposium*, Philadelphia, PA
Award for best poster in cell mechanobiology at conference

Hwang PY*, Gilchrist CL, Chen J, and Setton LA (2012). Nucleus Pulposus Cell Morphology and Phenotypic Dependence on Substrate Stiffness and Ligand. *Ann Mtg Biomedical Engineering Society*, Atlanta, Georgia.

Hwang PY*, Gilchrist CL, Francisco AT, Chen J, and Setton LA (2012). Cell Morphology and Migration of Nucleus Pulposus Cells Depends on Substrate Stiffness and Ligand. *ASME Bioengineering Conference*, Puerto Rico.

Hwang PY, Shamji MF, Jing L, Gabr M, Mata BA, Allen KA, Chen J, Richardson WJ, and Setton LA* (2011). Pain receptor expression in the midbrain in a rodent model of radiculopathy. *Intl Society for the Study of the Lumbar Spine (ISSLS),* Goteburg, Sweden.

Hwang PY*, Gilchrist Cl, Alcorta DA, Kelley MJ, Austin CP, Xia M, Huang R, Setton LA (2011). Response of molecularly targeted therapeuticsc in U-CH1 cells depends on 3D microenvironment. *Third Chordoma Research Community Conference*, Bethesda, MD.

Shamji MF*, **Hwang PY**, Allen KD, Gabr MA, Jing L, Chen J, Richardson WJ, Setton LA (2011). Midbrain neurotransmitter receptor expression and descending supraspinal control of nociception and pain behavior in radiculopathy. *Ann Meeting of the American Society of Neurological Surgeons*, Denver, CO.
2011 William H Sweet Award, presented to surgical collaborator MF Shamji, MD, PhD

Shamji MF*, **Hwang PY**, Allen KD, Gabr MA, Jing L, Chen J, Richardson WJ, Setton LA (2011). Evidence of descending supraspinal control of nociception and pain behavior in experimental disc-herniation radiculopathy. *27th Ann Meeting of the AANS/CNS Section on Disorders of the Spine and Peripheral Nerves*, Phoenix, AZ
2011 Mayfield Basic Science Award, presented to surgical collaborator MF Shamji, MD, PhD

Allen KD*, Adams SB Jr., Mata BA, Gabr MA, **Hwang PY**, and Setton LA (2010), Intra-articular delivery of an interleukin-1 antagonist partly reverses altered effects of rat knee instability. *Ann Mtg Biomedical Engineering Society*, Austin, TX.

Hwang PY*, Shamji MF, Bullock RW, Adams SB, Setton LA (2008). Injectable chitosan for local delivery of disease-modifying tumor necrosis factor drugs. *Ann Mtg Biomedical Engineering Society*, St Louis MO.

Bullock RW*, Shamji MF, **Hwang PY**, and Setton LA (2008). Delivery of small molecules, rhein and curcumin, from chitosan-glycerophosphate gels. *Ann Mtg Biomedical Engineering Society*, St Louis MO.

Shamji MF*, **Hwang PY**, Jing L, Chen J, Friedman AH, Richardson WJ, Setton LA (2008). Antagonism of TNF-alpha-induced inflammation and neurotoxicity in dorsal root ganglion explant cultures by an antagonist bonding protein. *Canadian Federation of Neurological Sciences*, Canada.

Adams SB*, Shamji MF, Nettles DL, **Hwang PY**, Easley ME, and Setton LA (2008). Sustained release of antibiotics from injectable cross-linked thermally responsive elastin-like polypeptide depots, *Orthopedic Research Society*, San Francisco, CA.

Shamji MF*, Chen J, **Hwang PY**, Jing L, Friedman AH, Richardson WJ (2008). Antagonism of TNF-alpha-induced inflammation and neurotoxicity in dorsal root ganglion explant cultures by an antagonist binding protein, *International Society for Study of the Lumbar Spine (ISSLS)*, Geneva, Switzerland.

Shamji MF*, **Hwang PY**, Nettles DL, and Setton LA (2007). Injectable chitosan for sustained protein delivery to treat painful radiculopahty, *NC Tissue Engineering Conference (NC TERM)*, Wake Forest, NC.

Hwang PY*, Black S, Bomze H, Skene JHP (2007). Use of BAC transgenic mice to express a CNS myelin protein, nogo, in peripheral myelin. *Duke University Neuroscience Annual Department Retreat,* Boone, NC.

Publications and Grant Review Activities

Journals

Co-editor, Frontiers in Materials
Reviewer, Nanoscale Advances
Reviewer, Oncogenesis
Reviewer, American Chemical Society
Reviewer, Acta Biomaterialia
Reviewer, PLoS One
Reviewer, Journal of Biomechanics
Reviewer, Soft Matter
Reviewer, Cells, Tissues and Organs

National Conferences

Reviewer, Annual Conference of the Biomedical Engineering Society, Abstract Reviewer and Chapter Development Reports
Reviewer, Summer Biomechanics, Bioengineering, and Biotransport Conference, Abstract Reviewer

National and International Grants

Ad-hoc Reviewer, NIH Study Section Cell Molecular Technologies (CMT); Innovative Molecular Analysis Technologies (IMAT)
Reviewer, NSF GRFP, BMMB, CMMI
Reviewer, Swiss National Science Foundation

Membership in Professional Societies

Biomedical Engineering Society – Member, 2010 - Present
American Society for Mechanical Engineers – Member, 2012 - Present

Students Mentored

Graduate Students

Gevick Safarians – Virginia Commonwealth University, Biomedical Engineering MD-PhD Doctoral Candidate 2030
Jessica Williamson – Virginia Commonwealth University, PhD Doctoral Candidate 2026

Corinne Leonard – Virginia Commonwealth University, PhD Doctoral Candidate 2026
Sydnie Tran - Virginia Commonwealth University, PhD Doctoral Candidate 2025
Jessanne Lichtenberg – Virginia Commonwealth University, PhD 2024
Logan Petry – Virginia Commonwealth University, Biomedical Engineering, MS 2023

Undergraduate and High School Students
Nafisa Anjum – Virginia Commonwealth University, McNair Scholar, Biomedical Engineering, B.S. 2027
John McKean – Virginia Commonwealth University, Biomedical Engineering, B.S. 2025
Valentina Santos Agreda – Virginia Commonwealth University, Biomedical Engineering, B.S. 2025
Hazel Sterling – Virginia Commonwealth University, Biomedical Engineering, B.S. 2027
Grace Panek – Iowa State University, REU Student, Biomedical Engineering B.S. 2026
Arpita Das – Virginia Tech University, Neuroscience B.S. 2029
Santiago Lopez – Virginia Commonwealth University, Biomedical Engineering B.S. 2023
Amanda Pearson – Virginia Commonwealth University, Biomedical Engineering B.S. 2024
Jesse Rolston – Virginia Commonwealth University, Biomedical Engineering B.S. 2025
Trey Redman – Virginia Commonwealth University, REU Student Biomedical Engineering, B.S. 2023
Omar Zeineddine – Virginia Commonwealth University, Biomedical Engineering B.S. 2025
Anna Young – University of Virginia, Biomedical Engineering B.S. 2026
Joyce Xu – Godwin High School, HS diploma 2026
Sowmya Narra– Maggie L Walker Governor's School, HS diploma 2024
Nora Kalra – Virginia Commonwealth University, Biomedical Engineering B.S. 2025
Anna Young– Maggie L Walker Governor's School, HS diploma 2022
Ella Ramamurthy – UC Berkeley, REU Student, Biomedical Engineering, B.S. 2024
Melissa Valladeres – Penn State University, REU Student, Biomedical Engineering, B.S. 2022
Caroline Rucker – Maggie L Walker Governor's School, HS diploma 2021
Nicholas Rhodes – Virginia Commonwealth University, Mechanical Engineering, B.S. 2021
Caleb McCurdy – Cornell University, Biomedical Engineering, B.S. 2022
Ashley King - Crossroads College Preparatory High School, HS diploma 2019
Rachel Jacobsohn - Washington University in St Louis, Biomedical Engineering, B.S. 2018
Benjamin Aunins - Washington University in St Louis, Biochemistry, B.S. 2018
Timothy Walden - Duke University, Biomedical Engineering, M.S. 2013
Jin Yun - North Carolina School of Science and Math High School, HS diploma 2013
Nathan Braejer - Washington University in St Louis, Biomedical Engineering, B.S. 2014
Davia Young - Durham School of the Arts High School, HS diploma 2013

Teaching Experience

Instructor, Virginia Commonwealth University, Department of Biomedical Engineering, Richmond VA 2020- present
- EGRB111: Introduction to Biological Systems in Engineering (~20-45 enrolled undergraduate students)
- EGRB303: Biotransport Processes (~50-60 enrolled undergraduate students)
- EGRB209: Quantitative Physiology (~20 enrolled undergraduate students)
- EGRB591: Microfluidic devices (Graduate-level course) (~10 enrolled senior undergraduate and graduate students)

Instructor, Duke Talent Identification Program (TIP) Scholar Weekends and Academic Adventures, Durham NC, 2011- 2015
- Designed and taught middle school and high school curriculum of weekend-long courses covering various biomedical engineering topics, such as: drug delivery, biomedical instrumentation, genome engineering, and orthopaedic engineering

Instructor, Duke Biosciences and Engineering Summer Camp, Durham NC, 2013- 2014

- Designed and taught middle school curriculum for a two-week summer camp with hands-on lab activities to cover topics in biosciences and engineering while developing the students' analytical thinking and problem solving skills.

Teaching Assistant: Department of Biomedical Engineering, Duke University, 2013 (Spring)
- BME354: Biomedical Instrumentation (~60 enrolled undergraduate students)

Teaching Assistant: Department of Biomedical Engineering, Duke University, 2011 (Spring)
- BME201: Electrophysiology (~50 enrolled undergraduate students)

Teaching Fellow, National Science Foundation and Pratt School of Engineering, Duke University, 2005-2006

Professional Service and Outreach

Chair-elect, Biophysical Society Bioengineering Sub-group, 2025-Present
Steering Committee, VCU Medical Scientist Training Program (MSTP) Program, Richmond VA 2023-Present
Advisory Committee, VCU National Scholarship Office (NSO), Richmond VA 2023-Present
Mentor, Massey Comprehensive Cancer Center P20 SUCCEED Program, Richmond VA 2024-Present
Research experience for undergraduates from Virginia State University (HBCU)
Mentor, Massey Comprehensive Cancer Center CHiSEL Program, Richmond VA 2022-Present
Research experience for high school students from the greater Richmond area
Institutional Biosafety Committee (IBC), Virginia Commonwealth University, Richmond VA 2021-present
Training and Education Strategic Planning Focus Group, Massey Comprehensive Cancer Center, Virginia Commonwealth University, Richmond VA 2020- present
Planning Committee & Instructor, Catalysts for Change (STEM outreach for females in under-represented backgrounds), Washington University in St. Louis, 2016- 2019
Presenter, Science Day, Club Blvd Humanities Magnet Elementary School, Durham NC, 2014- 2015
Mentor, Women and Math Network Mentoring Program, Durham NC, 2011-2013
Lead Camp Counselor and Steering Committee, Niklaus Children's Hospital Cancer Camp (Miami), 2008- Present
Editor, Dukengineer Magazine, Duke University School of Engineering, 2006-2008
Employer Ambassador and Diversity Team Liaison, Duke University Career Center, 2006-2008
Resident Assistant, Duke University Residence Life and Housing, 2005-2008
Summer Volunteer, Duke Raleigh Hospital, Raleigh NC, 2005