RUSH UNIVERSITY



2024 RUSH Mentoring Programs Tenth Annual Symposium

Thursday, Sept. 26, 2024

In-Person Podium Presentations

Noon to 3 p.m. Billings/Herrick (Searle Conference Center – 5th Floor of Professional Building)

In-Person

Networking Reception

3:30 p.m. to 5 p.m. Brainard (Searle Conference Center – 5th Floor of Professional Building)

Virtual Poster Session

From Thursday, Sept. 26, at 3 p.m., through Friday, Sept. 27, at 5 p.m. VoiceThread (Asynchronous)

Office of Faculty Affairs Office of Mentoring Programs 2024 RUSH Mentoring Programs

Tenth Annual Symposium | Sept. 26, 2024

Noon - 12:05 p.m.	Introductory Remarks Amarjit S. Virdi, PhD Director, Rush Mentoring Programs Office of Faculty Affairs, Rush University
12:05 - 12:35 p.m.	Keynote Speaker Robert S.D. Higgins, MD, MSHA President and Chief Academic Officer, Rush University
	2024 Cohn Fellow Presentations
12:35 - 12:50 p.m.	MD2 As A Biomarker Of Metastasis And A Therapeutic Target For Metastatic Prostate Cancer Adrian P. Mansini, PhD Assistant Professor Department of Dermatology, Rush Medical College
12:50 - 1:05 p.m.	Mechanosensitive MAS-Related G Protein Coupled Receptor-D Expressing Nociceptors Contribute To Pain in Surgically Induced Murine Osteoarthritis Alia M. Obeidat, BDS, PhD Instructor and Postdoctoral Fellow Department of Internal Medicine, Division of Rheumatology, Rush Medical College
1:05 - 1:20 p.m.	Biomaterials and Cellular Preconditioning Enhance Survival and Efficacy Of Transplanted Cells Following Spinal Cord Injury Brian T. David, PhD Assistant Professor Department of Neurosurgery, Rush Medical College
1:20 - 1:35 p.m.	FatherlyACT: A Technology-Enhanced And Sport-Based Program To Reduce the Intergenerational Transfer of Domestic Violence Chuka N. Emezue, PhD, MPH, MPA, CHES® Assistant Professor Department of Women, Children, and Family Nursing, Rush College of Nursing
1:35 - 1:50 p.m.	Assessing Mechanisms of Shoulder Function and Control Following Reverse Total Shoulder Arthroplasty Jonathan A. Gustafson, PhD Instructor Department of Orthopedic Surgery, Rush Medical College
1:50 - 2:05 p.m.	Impact of Diagnostic Stewardship on Catheter-Associated Urinary Tract Infections Sarah E. Sansom DO, MS Assistant Professor Department of Internal Medicine, Division of Infectious Diseases, Rush Medical College
2:05 - 2:20 p.m.	Noise & Aging: Teasing Apart Effects on Hearing Uzma S. Akhtar, PhD, AuD Assistant Professor Department of Communication Disorders & Sciences, Rush College of Health Sciences
2:20 - 2:35 p.m.	Award Announcements 2024 Mentee, Mentor and Postdoctoral Mentor of the Year

2:35 - 2:45 p.m.	Break
	2024 Abstract Winner Presentations
2:45 - 3 p.m.	Proteomic Characterization of Amyloid Beta Peptide Variants Reveals Unique Protein Interactome of Pyroglutamate Amyloid Beta in Alzheimer's Disease Human Hippocampus Liudmila Romanova, PhD Assistant Professor Department of Neurological Sciences, Rush Medical College
3 - 3:15 p.m.	MIND Diet, Cerebrovascular Health and Cognition Among Community-Dwelling Older Adults Puja Agarwal, PhD Assistant Professor Rush Alzheimer's Disease Center,Department of Internal Medicine, Rush Medical College
3:15 - 3:30 p.m.	Distinct Expression Patterns of Prrx1+ Chondroprogenitors in Limb Growth Plates: Conditional Ablation of Prrx1 Elucidates Mechanisms Underlying Chondrodysplasia Sai Rama Krishna Meka, PhD Postdoctoral Fellow Department of Orthopedic Surgery, Rush Medical College
Starts at 3:30 p.m.	Networking Reception - In Person (Brainard) From 3:30 p.m. to 5 p.m.
Starts at 3 p.m.	Virtual Poster Session - VoiceThread (Asynchronous) From Sept. 26 at 3 p.m. to Sept. 27 at 5 p.m.

Rush Mentoring Programs

Class of 2024 Cohn Fellows

Adrian P. Mansini, PhD Assistant Professor Department of Dermatology Rush Medical College

Brian T. David, PhD Assistant Professor Department of Neurosurgery Rush Medical College

Jonathan A. Gustafson, PhD Instructor

Department of Orthopedic Surgery Director of Research for the RUSH-IBTS International Fellowship Program Rush Medical College

Uzma S. Akhtar, PhD, AuD

Assistant Professor Department of Communication Disorders & Sciences Rush College of Health Sciences



Alia M. Obeidat, BDS, PhD Instructor and Postdoctoral Fellow Department of Internal Medicine, Division of Rheumatology Rush Medical College

Chuka N. Emezue, PhD, MPH, MPA, CHES® Assistant Professor Department of Women, Children, and Family Nursing Rush College of Nursing Sarah E. Sansom, DO, MS Assistant Professor Department of Internal Medicine, Division of Infectious Diseases Rush Medical College

Rush Mentoring Programs 2024 Award Winners



2024 Mentee of the Year

Kirsten Dickins, PhD, AM, APRN, FNP-C

Assistant Professor Community, Systems, and Mental Health Nursing RUSH College of Nursing

Awarded by the Rush Mentoring Programs in recognition of excellence in scholarly work, leadership and involvement in the Mentoring Program.

From nominator Barbara Swanson, PhD, RN, FAAN:

In the 30 months since completing her postdoctoral studies at Massachusetts General Hospital, Kristen Dickins has launched a remarkable program of research that will establish her as a pathfinder for developing scalable trauma-informed care for African American women experiencing homelessness. In this short time she obtained external funding from the Daisy Foundation, Chicago Chronic Conditions Equity Network, and the National Institutes for Health (KL2). She also received the Hillman Emergent Innovation Award, published 15 peer-reviewed papers, delivered 20 podium presentations and was awarded first place in the American Journal of Nursing Book of the Year (Research Category) for her book "Literature Review and Synthesis: A Guide for Nurses and Other Healthcare Professionals." Dickins also received five years of funding (on the first submission) for an R01 application to NIH/NINR in the amount of \$3.3M.

In FY24, she published three peer-reviewed publications, delivered six refereed presentations and four invited presentations at national/regional conferences, including one at NIH. She was awarded the top poster at the September 2023 Annual Workshop of the National Institute of Minority Health and Health Disparities Research Coordinating Center to Reduce Disparities in Multiple Chronic Diseases.

Dickins is committed to translating her work in service of promoting health equity through policy. Last year, the Chicago Department of Health invited her to join the 2024 – 2028 Chicago Housing Plan Steering Committee. The Steering Committee is charged with formulating plans to equitably build and distribute affordable housing throughout Chicago's 77 community areas. This invitation speaks to Dickins' already established reputation as a leader in translating empirical evidence into actionable policy.

In a short time, Dickins has built the foundation for what will certainly be a lifelong program of research to favorably change and save the lives of people who have experienced profound, and often persistent, trauma. Dickins' proposal to adapt Narrative Exposure Therapy (NET), an evidence-based trauma intervention, is not only innovative, but elegant in its simplicity. NET can be implemented in virtually any setting, is low cost, and can be facilitated by both health care providers or peers who do not hold advanced degrees or specialized knowledge.

Her work is distinguished by an emphasis on scalability and translation toward the goal of narrowing health disparities among socially disadvantaged women and has the potential to touch thousands of lives. She is an extraordinary and visionary scientist who has applied her substantial talents to directly address the toxic effects of structural racism, thus advancing social justice and narrowing of the health disparities gap. Perhaps most impressively, Dickins is a dynamic, out of the box thinker who has already established a remarkable record of scholarship in her nascent career. Her potential for generating knowledge that will transform practice and patients' lives has no ceiling. She exemplifies the vision, boldness, and commitment to the highest scientific standards.



2024 Mentor of the Year

Olimpia Paun, PhD, PMHCNS-BC Professor

Department of Community, Systems, and Mental Health Nursing Rush College of Nursing

Awarded by the Rush Mentoring Programs in recognition of outstanding contributions to mentees success, commitment and involvement in the Mentoring Program.

From nominator Hyejin Kim, PhD, RN:

Olimpia Paun has been dedicated to mentoring me since I joined Rush in January 2022. Since then, we have met every Thursday from noon to 1 pm, during which she offers invaluable guidance and support. She has consistently made herself available whenever I needed her advice, offering prompt feedback that made me feel both supported and appreciated. Under her mentorship I have grown in the right direction as a nurse researcher.

Working with Paun has influenced my career development and professional growth. Her mentorship has been invaluable, particularly in providing research guidance for my study on dementia caregiver stress among immigrant populations. Paun has over 20 years of experience in dementia caregiving research. This experience has enhanced the rigor of my research.

A key example is my first external grant submission to the Alzheimer's Association (AA), Paun offered detailed feedback, helping me refine my research aims, clarify hypotheses, and strengthen the methodological approach. Her insights were pivotal in improving the quality of my submission, ultimately leading to securing funding. Paun has also consistently supported my research efforts by connecting me with other researchers, inviting me to her National Institutes for Health (NIH) grant meetings and co-authoring several manuscripts with me. Through this collaborative process, I have learned how to design and conduct impactful research. These experiences have not only advanced my professional achievements but have also deepened our mentor-mentee relationship.

When I joined Rush, I was eager to apply for the NIH K grant, a career development award for junior faculty aimed at fostering independence and leading to R-level NIH funding. However, as a non-US citizen, I felt overwhelmed by the eligibility requirement of US citizenship. Paun, who also faced similar challenges as an immigrant researcher, recognized my struggle. She shared her own experiences and connected me with other international researchers who had successfully navigated similar obstacles. Paun helped me set realistic goals and advised me to apply for the Alzheimer's Association (AA) grant, which is open to international researchers, while simultaneously pursuing US permanent residency for future NIH grant applications. This guidance was pivotal, leading to my selection as an AA grant recipient—an achievement equivalent to the NIH K grant and a significant milestone in my career as junior faculty.

Paun has made valuable contributions to the Mentoring Programs through her active role as a speaker. She presented her NIH-funded research, focusing on the development of randomized controlled trials and the execution of rigorous studies specifically tailored for early-career faculty and postdoctoral fellows.



2024 Postdoctoral Mentor of the Year

Markus A. Wimmer, PhD

Professor Department of Orthopedic Surgery Rush Medical College

Awarded by the Rush Postdoctoral Society in recognition of outstanding contributions to the postdoctoral fellow's success, commitment and involvement in the Mentoring Program.

From nominator Mohammed AbuAlia, MD:

Markus A. Wimmer has been more than just a mentor to me. He has been a guiding force, a role model, and, in many ways, a father figure during my time at Rush University.

Moving to Chicago for my medical career was a significant step, one that came with its own set of challenges. Wimmer became not just my mentor but a cornerstone of my professional and personal life. My journey with Wimmer began when I was still a medical student, I was eager to gain research experience, and Wimmer saw something in me—a connection to my background as an auto mechanic. He recognized the parallels between the meticulous work I had done with engines and the precision required in orthopedic research. Under Wimmer's mentorship, I joined his lab as a Predoctoral Research Fellow on the T32 grant, and later as a Postdoctoral Research Fellow. His approach to mentorship is holistic—he doesn't just guide your research; he guides you as a person. In the lab, he encouraged me to think critically, to question the status quo, and to push the boundaries of what we know about orthopedic tribology and motion analysis.

One of the most profound impacts Wimmer had on me was during the process of publishing my first paper as a first author. This was a monumental task, filled with setbacks and moments of self-doubt. Wimmer taught me that setbacks are not just obstacles but opportunities to learn and grow. His guidance helped me navigate the complexities of academic writing, and the paper that was eventually published stands as a testament to his mentorship.

Wimmer's mentorship has shaped my career development through his hands-on involvement in every aspect of my research. From the beginning, he made it clear that his role was not just to oversee my work but to actively participate in my growth as a scientist. He provided meticulous feedback on my grant proposals, helping me understand the importance of crafting clear and compelling narratives that can secure funding. His guidance didn't stop at the proposal stage—he was deeply involved in the design and execution of experiments, ensuring that every aspect of our research was meticulously planned and executed. Wimmer's mentorship in this area has been invaluable, transforming the way I approach research and writing. His feedback was always constructive, often challenging me to delve deeper into the data and consider alternative interpretations. This process wasn't just about getting the paper published; it was about developing the skills and mindset needed to succeed in academic research.

Wimmer's mentorship is best illustrated not just by the papers we've published or the grants we've secured, but by the personal connection we've developed—a connection that has profoundly shaped both my professional and personal growth. One of the most memorable aspects of our relationship is our shared love for motorcycles and music. Early on in our time together, I shared with Wimmer my passion for building motorcycles. It wasn't just a passing interest for him; he took the time to appreciate the intricacies of my work, drawing parallels between the meticulousness required in both our hobbies and our research. This shared appreciation for craftsmanship deepened our bond and underscored his unique ability to connect with his mentees on a personal level.

Wimmer once told me, "Research is important, but it's the connections we make along the way that truly define our success." This philosophy has stayed with me and continues to guide how I approach both my work and my life.

Wimmer has been a cornerstone of the Rush Postdoctoral Society through his active and ongoing contributions. As a member of the Postdoctoral Committee at Rush, he has played a significant role in shaping the policies and programs that support postdoctoral fellows across the institution. His involvement goes beyond attending meetings—he actively contributes ideas and strategies to enhance the mentoring experience for postdocts, ensuring that the program remains robust and responsive to the needs of the community. He is also involved in the T32 Postdoctoral Program at Rush, where he serves as both a mentor and a co-director. His leadership and commitment to the mentoring program have not only strengthened the postdoctoral community at Rush but have also set a standard for mentorship that is recognized across the institution.

Rush Mentoring Programs Class of 2025 Cohn Fellows

Every year the Cohn Family Foundation provides grant funding to support junior faculty at Rush University who are mentees in the Rush Research Mentoring Program. The Cohn Fellowship allows mentees to gather preliminary data for research proposals and continue their research activities.

The following faculty members were selected as the Class of 2025 Cohn Fellows after a very competitive process.



Ana V. Chee, PhD, is an assistant professor in the Department of Orthopedic Surgery at Rush Medical College. Her research focuses on understanding the underlying molecular mechanisms of back pain and designing and testing biological therapies to combat these diseases. Using intervertebral disc tissue cultures, she has studied inflammatory chemokines and cytokines released by disc cells; the function of immune cell receptors on disc cells; and tested antiinflammatory treatments to reverse the inflammatory process. Using preclinical models, she has studied disc degeneration and back pain and tested cell therapies and anti-inflammatory treatments. Her Cohn Fellowship research will utilize intervertebral disc tissues retrieved from spine surgeries to characterize T cell populations in the intervertebral disc that contribute to inflammation and chronic back pain, and to identify sources of intervertebral disc inflammation that induce T cell migration and activation. Her studies will give us a better understanding of the role of T cells in back pain and help discover potential biological targets for back pain treatment.



Catherine Yuh, PhD, is an instructor in the Department of Orthopedic Surgery at Rush Medical College. Her research includes characterizing mechano-biological relationships in mechanoactive tissues and studying relationships between joint anatomical shape and tissue properties, in the context orthopedic disorders including femoroacetabular impingement syndrome and intervertebral disc degeneration. Her Cohn Fellowship will investigate how joint shape is associated with underlying tissue structure and biochemistry in hips with femoroacetabular impingement syndrome. This research will contribute to a long-term collaborative effort to establish a platform of multi-modal approaches, including tissue characterization, imaging, motion analysis, and computational simulation, to study the multifaceted etiology of pre-arthritic hip disorders.



Hyejin Kim, PhD, RN, is an assistant professor in the Department of Adult Health and Gerontological Nursing at Rush University College of Nursing. Her research focuses on psychological and social aspects of late-life cognitive changes such as Alzheimer's disease and related dementias (ADRD) and mild cognitive impairment. Her training on ADRD caregiving stress in ethnically diverse populations has led her to a technology-based approach for detecting stress in Korean-American home care workers of persons with ADRD, a significant yet understudied ethnic group. Her Cohn Fellowship research will use wearable technology (i.e., Ōura ring) to assess heart rate variability, an emerging stress biomarker, over time in Korean-American HCWs who provide care to Korean-Americans diagnosed with ADRD.



Jeffrey Schneider, PhD, is an assistant professor in the department of Microbial Pathogens and Immunity at Rush Medical College, where he is currently investigating HIV, COVID-19, breast cancer, and Alzheimer's Disease. Schneider got his PhD from the University of Chicago where he studied biochemistry. He did his postdoctoral fellowship at Northwestern University in the laboratory of Dr. Thomas Hope, where he used these skills to tease apart mucosal antibody interactions in the context of HIV infection. During this time, he helped develop a platform to track antibodies in vivo through fluorophore conjugation and contributed to this body of research by helping to show that it takes a week for antibodies to reach the vaginal mucosal surface following IV injection. He received a K01 to use this platform to investigate how the timing of broadly neutralizing antibody injection affects distal site accumulation of virus following intravaginal challenge. In this Cohn fellowship, Schneider will tease out the cellular populations involved in HIV rebound in the brain, following cART cessation, in order to gain insight into potential ways of targeting this viral reservoir.



Steven P. Mell, PhD, is an instructor in the Department of Orthopedic Surgery. His research focuses on studying the mechanical behavior of natural and artificial human joints. Specifically, he is interested in studying the in vivo behavior, failure and disease processes of orthopaedic implants and natural joints through computational modeling. During his PhD, he investigated total knee replacement wear through both computational and experimental methods. He has been active in the study of patella-femoral joint mechanics, total hip replacement taper assembly, and the mechanical behavior of articular cartilage. For his Cohn Fellowship research, Mell will study how FAI disease severity affects hip joint contact mechanics. He will use motion analysis and musculoskeletal modelling to compare joint contact forces before and after hip arthroscopy for cam type femoroacetabular impingement (FAI) using high throughput markerless motion capture and develop finite element models of a cam type FAI population using statistical shape modeling. If successful, this research will provide insight into how arthroscopic surgery and FAI disease severity affect hip joint mechanics, with an overarching goal of identifying modifiable factors of FAI associated with hip osteoarthritis development.

Rush Mentoring Programs 2024 Graduating Mentees

Mentees graduate from the Rush Research Mentoring Program and become junior mentors after they have been in the program for five years.



Amanda R. Mathew, PhD Associate Professor Department of Preventive Medicine Rush Medical College



Hemil Gonzalez, MD Assistant Professor Department of Internal Medicine Rush Medical College



Brian T. David, PhD Assistant Professor Department of Neurosurgery Rush Medical College



Jori Fleisher, MD, MSCE, FAAN Associate Professor Department of Neurological Sciences Rush Medical College



Frank C. Ko, PhD Assistant Professor Department of Anatomy & Cell Biology Rush Medical College



Meghan Moran, PhD Assistant Professor Department of Anatomy & Cell Biology Rush Medical College



Heide Cygan, DNP, RN Associate Professor Department of Community, Systems and Mental Health Nursing Rush College of Nursing



Vaskar Das, PhD Assistant Professor Department of Anesthesiology Rush Medical College

Rush Mentoring Programs Poster Presentations

- 1. AbuAlia, M. et al. Exploring the Mechanical Role of COMP & Other Small Molecules in a Cartilage Model: A Rheological Approach
- 2. Bucklin, M. et al. Income Predicts Chronic Low Back Pain but Not Lumbar Disc Height: Data for the UK Biobank Image Dataset
- **3.** David, B. et al. Delayed Administration of a TNF-α Inhibitor in Microscaffolds for the Mitigation of Inflammation Following Spinal Cord Injury
- 4. Day, J. et al. 3D Printing as a Novel Means of Thyroid Volumetrics and Goiter Visualization
- 5. Gonzalez, F. et al. Identifying Gait Subgroups in Low Back Pain Patients with Artificial Intelligence: Implications for Personalized Interventions
- 6. Gonzalez, F. et al. Leveraging Artificial Intelligence to Uncover Unique Biomechanical Running Profiles
- 7. Gonzalez, F. et al. Three-Dimensional Motion Analysis in Medial Meniscus Posterior Root Tears: Investigating Biomechanical Risk Factors After Surgery
- 8. Gonzalez, F. et al. The Rising Challenge of Total Knee Arthroplasty in Young Patients: A Review of Implant Survivorship, Biokinetic Risk Factors, Revision Rates, Sports Participation, and Surgical Techniques
- 9. Handoklow, L. et al. Comparative Analysis of Deep Learning Models for Quantifying Differences in Intervertebral Disc Histology
- **10. Kirby, A. et al.** Motoric and motivational effects of subthalamic deep brain stimulation in a 60HDA rat model of early Parkinson's Disease
- 11. Lee, H. et al. Examining Endothelial-Mesenchymal Transition in Intramembranous Bone Regeneration
- 12. Leporace, G. et al. Plantar Flexion Strength is Related to Foot and Ankle Running Biomechanics in Runners with Achilles Tendinopathy
- Meka S.R.K. et al. IL-36R-α Selectively Modulates IL-1β and IL-36α-Induced Inflammation in Articular Chondrocytes with Distinct Regulatory Effects
- **14. Mishra, P. et al.** Understanding novel-tissue parameters in single-cell RNA sequencing through systematic, human-in-the-loop pipelines
- **15. Obeidat, A. et al.** Mechanosensitive MAS-Related G Protein Coupled Receptor-D Expressing Nociceptors Contribute to Pain in Surgically Induced Murine Osteoarthritis
- 16. Pallone, L. et al. The broken windlass: lower-limb biomechanics in patients with plantar fasciitis
- **17. Pallone, L. et al.** Women with patellofemoral pain syndrome exhibit different movement patterns in comparison to men: a systematic review and meta-analysis
- 18. Perrone, M. et al. An Image Autoencoder for Learning Latent Disc Geometry from Segmented Lumbar Spine MRI
- 19. Perrone, M. et al. Deep Learning-Based Predictions of Polyethylene Insert Wear in Total Knee Replacements
- 20. Wiseman, I. et al. Upregulation of Glucose Transporter Type 1 in Lumbar Disc after Annulus Fibrosus Injury
- **21.** Yuh, C. et al. Comparison of Proximal Femur Shape in Patients with Cam-type Femoroacetabular Impingement Before and After Hip Arthroscopic Surgery: A Statistical Shape Modeling Study

Rush Mentoring Programs Special Thanks

The Cohn Family

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Office of Faculty Affairs

Armour Academic Center 600 S. Paulina St., Suite 1044 Chicago, IL 60612 faculty_affairs@rush.edu rushu.rush.edu/about/faculty-affairs

Office of Mentoring Programs

Armour Academic Center 600 S. Paulina St., Suite 1037 Chicago, IL 60612 mentoringprograms@rush.edu

rushu.rush.edu/mentoringprogram



Amarjit S. Virdi, PhD Director Office of Mentoring Programs (312) 563-3146 amarjit_virdi@rush.edu

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