

Ferguson Lab is On the Move: *New Lab Space Coming in 2026*

The Ferguson Laboratory for Orthopaedic and Spine Research is preparing for an exciting transition as it, along with the core Department of Orthopaedic Surgery bench-top laboratories, move into a new, state-of-the-art 25,000 square foot space.

Background:

The Creation of the BMRC

The move is part of the creation and ongoing development of the Bethel Musculoskeletal Research Center at the University of Pittsburgh (BMRC). The University of Pittsburgh and the Department of Orthopaedic Surgery established the Bethel Musculoskeletal Research Center (BMRC), a groundbreaking initiative bolstered by a generous \$25 million gift from the Orland Bethel Family Foundation and matched by the University of Pittsburgh. This \$50 million endeavor is transforming the field of musculoskeletal research at Pitt and UPMC. The BMRC was envisioned and is led by founding executive director **Joon Y. Lee, MD**. Dr. Lee is the Orland Bethel Professor in Spine Surgery in the Department of Orthopaedic Surgery and clinical director of the Ferguson Laboratory for Orthopaedic and Spine Research.

The BMRC stands out in its approach to musculoskeletal research. Unlike traditional research centers that focus predominantly on basic science, the BMRC is a blend of basic, bench-top science and clinical research groups and priorities. This structure is intended to foster translational



Ferguson Lab team packs to move to a temporary space while their new, permanent home is under construction.

research, ensuring discoveries are swiftly and effectively translated into clinical practice at the bedside.

About the New Laboratory Space

The new space being constructed to house the Ferguson Lab and several other

labs focused on musculoskeletal research in the Department of Orthopaedic Surgery and Department of Physical Medicine and Rehabilitation represents a significant upgrade in facilities and capabilities, designed to foster collaboration and advance research in musculoskeletal health.

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Ferguson Lab is On the Move *(continued)*

“This move is an incredible opportunity to integrate resources, bring together diverse research teams, and create a dynamic space for innovation,” says **Laurie Dearolf, PhD**, administrative director of the BMRC, who is overseeing the creation of the new lab space.

A Purpose-Built Space for Innovation

The new space will occupy half of the 16th floor of the BST, offering modernized research facilities tailored to the needs of BMRC-affiliated labs, including the Ferguson Lab. Key features of the new multidisciplinary space include shared lab resources, centralized equipment, and flexible workspaces designed to support interdisciplinary collaboration.

Among the highlights for the new facility will be a new surgical education center, where residents and medical students – and faculty – can refine their skills using advanced tools and techniques while working in a new space that offers the chance for closer collaboration across disciplines.

“Having a dedicated surgical education center will allow us to provide hands-on training for the next generation of clinicians,” says Dr. Dearolf. “Additionally, centralizing specialized equipment and resources will streamline our operations and enhance productivity across all of the BMRC’s affiliated labs.”

The construction and move also reflects a thoughtful approach to the design and location, one which is close to UPMC Presbyterian, enabling seamless interactions between researchers, surgeons, and clinical care teams.

Enhanced Collaboration and Shared Resources

A central goal of the new space is to foster collaboration in research – across labs and research disciplines – basic, clinical, and translational science.

The Ferguson Lab will share the facility with other BMRC-affiliated groups, including the Mechanobiology Lab, Joint Tissue Biology and Engineering Lab, and several other of the core research labs at the BMRC. This co-location will create opportunities for resource sharing, including access to advanced imaging technologies, molecular biology tools, and other specialized equipment.

The launch of the BMRC, the Bethel Orthopaedic Biobank, and move into this innovative new space serves as a catalyst for our research programs and our drive to become a global leader in orthopaedic and musculoskeletal research.

MaCalus V. Hogan, MD, MBA
*David Silver Professor and Chair
Department of Orthopaedic Surgery/
Chief, UPMC Orthopaedic Service Line*

“By bringing these groups together, we’re building an environment where synergistic collaboration happens naturally,” says **Nam Vo, PhD**, co-director of the Ferguson Lab and professor and vice chair of research in the Department of Orthopaedic Surgery. “For example, having shared animal models and research resources in one place makes it much easier to coordinate efforts and share findings.”

Another advantage of the shared space is the ability to house novel research tools in a common location.

“When labs are spread out across different buildings, it can be logistically challenging to share equipment. In this new facility, we’ll be able to maximize the utility of cutting-edge resources,” says Dr. Vo.

Advancing Research Directions

The new facility also will support the Ferguson Lab’s expanding research agenda.

The development of new model systems for aging processes that affect the musculoskeletal system broadly, and specific orthopaedic conditions is a priority area. These models will be shared across labs to enable integrated research into musculoskeletal health.

“For example, we’re establishing new model systems that allow us to study multiple tissues from a single subject, such as the spine, knee, and hip,” says Dr. Vo. “This integrated approach not only improves efficiency but also our work.”

The move also positions the lab to continue its major research projects, such as the LB3P study, which focuses on phenotyping chronic low back pain patients to develop targeted therapies.

“We’re in the renewal phase right now for the LB3P project, but we expect this important work will keep going and benefit greatly once we move to our new home next year,” says Dr. Vo.

With expanded capabilities and new tools, the future home of the Ferguson Lab will be well-equipped to explore innovative directions in musculoskeletal research.

“This new space is more than just a physical upgrade for our research teams – it’s a big step forward for our entire Pitt Orthopaedic research community,” says Dr. Vo. “We’re excited for the opportunities it will bring to our faculty, staff, and trainees.”

Ferguson Lab Trainee Spotlight: *Anna Bailes, DPT, PhD*



Anna Bailes, DPT, PhD, recently completed the dual DPT/PhD program at the University of Pittsburgh’s School of Rehabilitation Sciences and the Swanson School of Engineering.

After graduating from Washington University in St. Louis with a Bachelor of Science in Bioengineering, Dr. Bailes joined the University of Pittsburgh’s combined Doctor of Physical Therapy (DPT) - PhD in Bioengineering (DPT/PhD) program. The program’s structure allowed her to integrate advanced clinical training with cutting-edge research, creating the foundation for her career at the intersection of clinical practice and biomechanics.

As a trainee in the **Ferguson Laboratory for Orthopaedic and Spine Research**, Dr. Bailes explored the interplay between chronic pain, psychology, and movement. She will soon begin a postdoctoral fellowship at Stanford University, focusing on pediatric chronic pain research.

In the days after successfully defending her doctoral dissertation and preparing to transition to Stanford, Dr. Bailes reflected on her experience in the program and her time in the Ferguson Lab.

“Take advantage of the interdisciplinary opportunities available. Engaging in both clinical practice and research can give you a unique perspective and open doors to innovative approaches in health care,” says Dr. Bailes.

Research Focus and Dissertation Work

Dr. Bailes’ research was conducted under the mentorship of **Gwendolyn Sowa, MD, PhD**, co-director of the Ferguson Lab and chair of the Department of Physical Medicine and Rehabilitation, and **Rakié Cham, PhD**, professor of Bioengineering at the Swanson School for Engineering and principal investigator at the Human Movement and Balance Lab (HMBL).

Her work focused on how negative appraisals of pain affect movement in individuals with chronic low back pain. These negative appraisals of pain can be termed ‘pain-related psychological factors’

and include things like fear of pain and catastrophic thinking.

“I had the incredible opportunity to work in two different labs since I was co-advised for my PhD,” says Dr. Bailes. “In the Ferguson Lab, I worked with the LB3P project, a large phenotyping study aimed at identifying subgroups of individuals with chronic low back pain to develop more targeted treatments. In the HMBL, we used motion tracking technology to study human movement. I focused on the impact of pain-related psychological factors on gait in people with chronic low back pain.”

Dr. Bailes’s doctoral dissertation utilized advanced motion tracking technologies, including accelerometers and optoelectronic motion capture systems to quantify movement patterns. She also examined the relationship between attention, a cognitive resource, and movement in people with chronic low back pain. Her findings provided new insights into how psychological and cognitive factors contribute to altered gait and rehabilitation challenges.

“Gait requires higher-level cognitive resources, such as attention. In chronic pain, these processes can be disrupted. For my dissertation, I studied whether attentional disruptions played a role in altered movement patterns,” says Dr. Bailes.

Experience in the Ferguson Lab

Dr. Bailes highlighted her time in the Ferguson Lab as a transformative period during her studies. The collaborative and multidisciplinary environment fostered her growth as both a researcher and physical therapist.

“The Ferguson Lab fosters a sense of community and collaboration. I was fortunate to work under mentors like Dr. Sowa, who has been an incredible advocate and guide throughout my training,” says Dr. Bailes.

The opportunity to collaborate with a diverse group of trainees, including undergraduates, medical students, and engineers, enriched her experience and broadened her perspective on the nature of interdisciplinary research and what it can accomplish in terms of transforming and creating new modes of care of patients.

Moving Forward: A New Chapter at Stanford

Dr. Bailes will soon begin a postdoctoral fellowship in the Department of Anesthesiology at Stanford University, focusing on pediatric chronic pain. Her research will examine conditions including amplified musculoskeletal pain syndrome and complex regional pain syndrome, aiming to better understand the mechanisms underlying these chronic pain conditions and develop improved treatment approaches.

“Chronic pain in children is an underexplored area, and I am excited to contribute to improving our understanding and management of these conditions,” says Dr. Bailes. “When a person is dealing with chronic pain, it can disrupt every facet of their lives and lead to reduced quality of life. I want to change that reality for the better.”

In addition to her focus on research, Dr. Bailes will maintain a clinical role, working as a physical therapist in Stanford’s pediatric outpatient clinic. She plans to continue integrating her clinical expertise with her research to develop interventions that address the multifaceted needs of patients with chronic pain.

“UPMC, the University of Pittsburgh, and the Ferguson Lab provided a dynamic and supportive environment where I developed technical skills and built lifelong connections with mentors and peers,” says Dr. Bailes. “Pittsburgh and the lab will always hold a special place in my career journey.”

UPDATES FROM THE BETHEL MUSCULOSKELETAL RESEARCH CENTER (BMRC)



Biobank Starts Processing First Tissue Samples

The BMRC and its recently established biobank began processing and storing tissue samples for the first time at the end of October 2024. The biobank was established with the aid of an \$18.5 million investment from the Orland Bethel Family Foundation in October 2024 and comes on the heels of several previous philanthropic donations during the last 18 months from the foundation to create the BMRC at the University of Pittsburgh.

The goal of the new biospecimen repository is to enhance research capabilities for understanding and treating arthritis and other debilitating musculoskeletal conditions that impact millions globally.

Read more about the new biobank at bethel.pitt.edu.

Fellowship Opportunity for Early-Career Researchers

The BMRC Postdoctoral/Resident Fellowship award is for one year and in the amount of \$20,000. The BMRC Junior Faculty Fellowship award is for one year and in the amount of \$30,000. All recipients must be active members of the Orthopaedic Research Society. Funding is to support generation of preliminary data for subsequent larger grant applications.

Letters of intent are due by **April 1, 2025**, with full applications to follow. This program aims to foster collaboration and accelerate impactful research.

For full details and to apply, visit www.bethel.pitt.edu/fellowships.

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