

# Leading the Way in Musculoskeletal Health

From Discovery to Impact

2024/25 Annual Report



**MCCAIG**INSTITUTE  
FOR BONE AND JOINT HEALTH



**UNIVERSITY OF  
CALGARY**

## From the Director, Dr. Cheryl Barnabe



Inspired, inspiring and committed, members of the McCaig Institute for Bone and Joint Health actively advance discovery and implement research that empowers mobility for life. Orthopaedics, rheumatology and bone health research and education anchor our activities, while we support emergent areas of expertise in musculoskeletal oncology, spine health and pediatric musculoskeletal health.

An external review of the McCaig Institute was conducted in the fall of 2024 and highlighted the collegial and dynamic environment we are so fortunate to work in. The reviewers praised our achievements in research and training, noting the beneficial impacts on movement, function and musculoskeletal care access and treatment in the population, across the lifespan and in diverse communities.

Thank you to all faculty, staff and trainees who enthusiastically contribute to our mission, and to our partners who continuously demonstrate their support for bone and joint health research. We will continue promoting the McCaig Institute within our local communities and the arthritis and bone health research ecosystem nationally and globally.

## New Recruits



In July 2024, **Dr. Maggie Larché** joined the University of Calgary as a Professor and Division Head of Rheumatology. As director of the Canadian Scleroderma Research Group, she is expanding their longitudinal database with clinical data and biospecimens to guide research and patient care.



In August 2024, **Dr. Cassandra Turcotte** joined the University of Calgary as an Assistant Professor of Cell Biology and Anatomy. She focuses her research on the relationship between life history and the musculoskeletal system.

## Our Members

**120**

Faculty

(from Cumming School of Medicine, Kinesiology, Schulich School of Engineering, Veterinary Medicine, U of A, MRU, and UBC)



**131**

Staff

**102**

MSc Students

**64**

PhD Students



**30**

Postdoctoral  
Fellows

**51**

Undergraduate Students,  
and Clinical Residents  
and Fellows

## Finances

<b>2024-2025 Revenue:</b>	<b>\$ 1,152,321</b>
Philanthropy	\$ 554,365
McCaig Chair	\$ 250,000
Endowments	\$ 38,600
SPARC Partnerships	\$ 135,000
Contributions to Summer Studentships	\$ 44,500
Alumni Partnership	\$ 9,500
Biomechanics Lab Support	\$ 33,219
Carry-over Funds	\$ 87,137
<b>2024-2025 Expenses:</b>	<b>\$ 1,084,664</b>
Institute Operations	\$ 542,422
Community Events	\$ 41,674
Strategic Initiatives (MoJo, M4L, Biomechanics)	\$ 174,194
SPARC Awards	\$ 180,000
Studentship Awards	\$ 87,841
Other Education and Research Programs	\$ 58,533

# Centre for Mobility and Joint Health (MoJo)

The MoJo provides research teams with access to world-class imaging equipment, customized imaging protocol development, tailored reporting, flexible participant appointment scheduling and imaging access through a specialized system for managing and accessing imaging data. The MoJo supports over 60 studies and clinical trials across four faculties at the University of Calgary, in addition to industry-led research.



## STUDY HIGHLIGHT

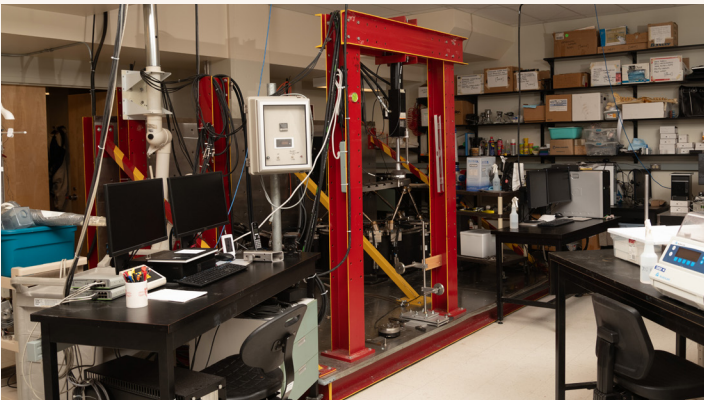
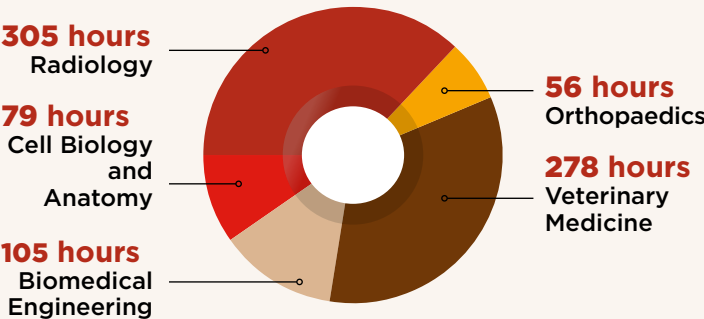
**ARTININ** (AI initiative for prediction of fracture risk)  
*PI: Dr. Steven Boyd*  
This study aims to acquire clinical dual-energy CT scans and develop AI-driven machine learning methods to identify specific bones relevant to osteoporosis. This critical step will help advance techniques for predicting fragility fractures.

Pictured left: McCaig trainee and CT machine.

## Biomechanics Lab

The McCaig Institute Biomechanics Lab provides mechanical testing of bone, joint and soft tissue samples varying in sizes and including rodent, human and equine species.

### Lab Usage Hours by Department



### Department of Biomedical Engineering

**Biomechanical effects of ankle-foot orthosis**  
Dr. Emily Rogers-Bradley & graduate student

**Material characterization of additively manufactured elastomers**  
Dr. Amin Komeili & graduate student

**Collagenous structure changes in patients with spinal disorder**  
Dr. Neil Duncan & 2 graduate students

### Department of Cell Biology & Anatomy

**Non-invasive ACL rupture in mice**  
Dr. Roman Krawetz & graduate student

**Effects of antiepileptic drugs on bone remodeling**  
Dr. Roman Krawetz & graduate student

### Department of Surgery/Section of Orthopaedic Surgery

**Contribution of degenerated discs to spinal disorders**  
Dr. Ganesh Swamy & 2 graduate students

**Biomechanical analysis of femoral neck fixation**  
Dr. Prism Schneider & 2 residents

### Faculty of Veterinary Medicine

**Model of equine stifle soft-tissue injury**  
Dr. Holly Sparks & 2 graduate students

**Tendon and ligament strain in the equine forelimb**  
Dr. Holly Sparks & graduate student

### Department of Radiology

**Atlas of articular cartilage across species**  
Dr. Sarah Manske & graduate student



## Our Research Priorities

We approach bone and joint research valuing innovation and collaboration, aiming to improve quality of life for the community and beyond by preserving mobility. Our multidisciplinary teams tackle some of the most challenging health issues related to bone and joint health. Here are some of the important research initiatives we are undertaking:



### OSTEOARTHRITIS

Identifying the contributors to osteoarthritis development and informing prevention and treatment.

### MUSCULOSKELETAL ONCOLOGY

Developing treatments for sarcoma and metastatic bone disease to improve patient outcomes.

### SPINE HEALTH

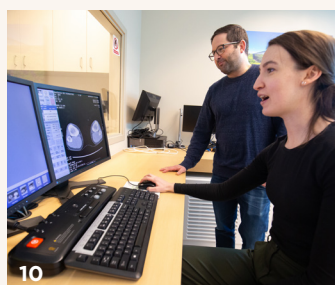
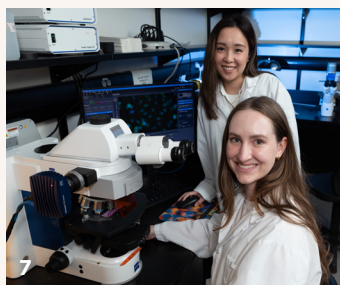
Investigating spinal diseases and post-surgical outcomes.

### RHEUMATOLOGY

Advancing early diagnosis and personalized treatment for autoimmune rheumatic diseases.

### OSTEOPOROSIS AND BONE HEALTH

Developing new ways to improve bone health and stop bone loss.



**1. Dr. Sarah Manske** is pioneering high-resolution imaging approaches to track changes in joints over time.

**2. Dr. Antoine Dufour's** proteomics research is uncovering new therapeutic targets for osteoarthritis.

**3. Dr. Michael Monument's** immunotherapy research aims to reduce sarcoma tumor sizes before surgery, enhancing surgical effectiveness.

**4. Dr. Joe Kendal's** SMaRT Bone initiative is improving care delivery for patients with metastatic bone disease.

**5. Dr. Ganesh Swamy's** research investigates biomarkers in scoliosis and sciatica, aiming to understand their progression and identify optimal treatments.

**6. Dr. Koren Roach's** advanced imaging techniques provide dynamic insights into spinal motion and post-surgery mobility.

**7. Dr. May Choi** is an international leader in developing advanced diagnostic tools for lupus and other autoimmune diseases, enhancing early detection and precision management strategies.

**8. Dr. Cheryl Barnabe** explores risk factors for the development of inflammatory arthritis and improves health service delivery for rheumatic disease care.

**9. Dr. Leigh Gabel's** STOP-EM project explores the effects of strength training on bone loss in peri-menopausal and menopausal women.

**10. Dr. Brent Edwards** is leading research on bone biomechanics, providing insights into fracture risk and prevention strategies.





## External Review

The McCaig Institute for Bone and Joint Health underwent an external review to gain insight into the institute's activities and future directions. Dr. Candace Feldman, Dr. Cheryle Seguin and Dr. Kishore Mulpuri led the review, evaluating the institute's strengths, areas for improvement and opportunities for growth.

From October 28-29, these experts engaged with dedicated members of the McCaig Institute, whose contributions were vital to the review process. The findings highlight the collaborative efforts that propel our mission.



### Strengths:

- Excellence in transdisciplinary research.
- A culture of collegiality that fosters deep allegiance among researchers.
- The range and impact of programs offered by the institute.

### Next Steps:

- Enhanced support and resources for Early Career Researchers, including networking opportunities.
- Strategic recruitment of clinician-scientists to bolster translational research and expand Canada Research Chairs. Targeted areas include metabolic bone diseases, pediatric radiology, sports medicine, and more.
- Bridge funding to support the continuation of research projects and infrastructure, with a focus on collective hires such as administrative support and shared research staff.

**These insights and recommendations will guide the McCaig Institute as we continue to innovate and contribute to the field of bone and joint health.**

## Community Events



Dr. Robyn Tamblyn presenting at the Cy Frank Legacy Lectureship



Science in the Cinema panelists (L to R) Drs. Barber, Choi and Barnabe



Dr. Fred Nicholls presenting at the Wood Forum

### DR. CY FRANK LEGACY LECTURESHIP 82 in-person & 62 virtual

Dr. Robyn Tamblyn, a professor at McGill University, delivered an insightful presentation on Innovations in Clinical Care. Her research focuses on enhancing the safety and quality of health care.

### WOOD FORUM 200 in-person & 60 virtual

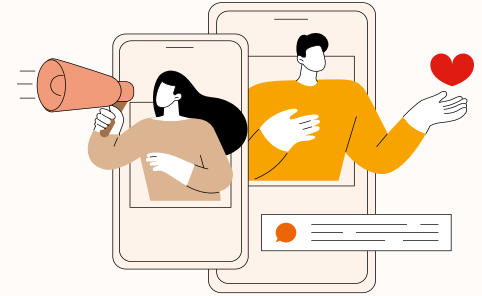
The 30th anniversary of the Wood Forum featured the theme "Back Matters: Advances in Spine Research." Leading experts, including Dr. Ganesh Swamy, Dr. Fred Nicholls and Dr. David

Cadotte, discussed topics such as back pain, sciatica, scoliosis, and the role of AI in spinal care. Dr. John McWhae shared his personal experience of living with a spine condition. The anniversary was also marked by the announcement of a generous gift from Dr. Donna Wood and her family, ensuring the forum's continued legacy.

### SCIENCE IN THE CINEMA 180 in-person

The screening of Wildcat took place as part of the Science in the Cinema series. Dr. Cheryl Barnabe moderated a discussion on lupus care, featuring Drs. May Choi and Claire Barber.

## Digital Engagement



### Research in Motion (quarterly newsletter)

**935+**  
subscribers  
(41% increase)

**Facebook**  
**455 ↑ 2%**

**Instagram**  
**645 ↑ 9 %**

**X**  
**871 ↓ 1 %**

**YouTube**  
**501 ↑ 6%**

**LinkedIn**  
**249 ↑ 76%**

## Contact

✉ [mccaig@ucalgary.ca](mailto:mccaig@ucalgary.ca)  
☎ 403-210-6774  
🌐 [mccaig.ucalgary.ca](http://mccaig.ucalgary.ca)

**McCaig Institute for Bone and Joint Health**  
Cumming School of Medicine  
University of Calgary  
HRIC 3A08, 3280 Hospital Drive NW  
Calgary, Alberta T2N 4Z6

