

The University of Calgary is recruiting for a graduate student position leading to the degree of Masters of Science (MSc) in Kinesiology, Biomedical Engineering, or Medical Sciences. The student will have the opportunity to work at the McCaig Institute for Bone and Joint Health and the world-renowned Human Performance Laboratory on a multidisciplinary research project relating to musculoskeletal biomechanics, dermatology, rheumatology, and biomedical imaging.

Research Topic

Psoriasis is a chronic inflammatory skin disease characterized by red, scaly plaques. Up to one third of patients with psoriasis develop psoriatic arthritis (PsA), an inflammatory arthritis that can lead to irreversible joint and tendon changes that affect mobility, with a particular propensity to affect the foot and ankle. It has long been thought that mechanical loading may precipitate both psoriasis skin plaques as well as the development of psoriatic arthritis; however, there is little scientific data available to understand the immunology and pathomechanics relating to this process. In the proposed graduate student thesis, patients with psoriasis and psoriatic arthritis will be recruited to complete a variety of tests which include (a) blood serum inflammatory biomarker profiling, (b) clinical CT imaging of the foot and ankle with extraction of bone architectural properties, (c) ankle joint and Achilles tendon biomechanical analysis using ultrasound and isometric dynamometry. The relationship between these data will be determined to reveal the interplay between biomechanics, inflammation and bone changes in the foot and ankle in patients with psoriasis and psoriatic arthritis. Ethics approval has already been granted and testing facilities are operational allowing for early commencement of research as a graduate student.

Supervisors

- Dr. Brent Edwards, PhD – Faculty of Kinesiology and Biomedical Engineering Graduate Program
- Dr. Ryan Lewinson, MD, PhD – Faculty of Kinesiology and Division of Dermatology
- Mentorship from clinical and scientific faculty members within the Faculty of Kinesiology's Human Performance Lab, the Schulich School of Engineering, Division of Rheumatology, Division of Dermatology, Division of Biochemistry and Cell Biology, and Division of Radiology.

Funding

The selected student will be offered two years of guaranteed funding (\$17,500 per year for MSc). There are also numerous additional sources of competitive funding available through the Natural Sciences and Engineering Research Council of Canada (NSERC), the Canadian Institutes of Health Research (CIHR), Alberta Innovates, and the University of Calgary.

Qualified applicants will have the following:

- A 4-year undergraduate degree in kinesiology, engineering, medical science, basic sciences or equivalent, or a medical degree (MD) with demonstrated interest and/or achievement in biomechanics, imaging, rheumatology or dermatology.
- Completed honours thesis research is an asset.
- Completed coursework in biomechanics and or/engineering mechanics is an asset.
- A strong GPA in the past two years to ensure competitiveness for external funding.
- Availability to commence their graduate degree program January 2020, May 2020 or September 2020 with ability to commit to a 2 year training program.

Location

The University of Calgary is located in Calgary, Alberta Canada – a multicultural city in Western Canada with a population over one million, a one hour drive to the Canadian Rocky Mountains and averaging 333 days of sunshine per year. Calgary is home to professional sports teams, world-class outdoor activities including hiking and skiing, as well as diverse dining and shopping options and vibrant nightlife.

The University of Calgary was recently ranked the #1 University in the world under 50 years old, and is considered among Canada's top research institutions. The McCaig Institute for Bone and Joint Health is comprised of scientists and clinicians from a variety of academic faculties and departments with collective interests in musculoskeletal health, and is the location of the state-of-the-art Centre for Mobility and Joint Health (MoJo) laboratory, where the research will primarily occur. The graduate student will also work within the renowned Human Performance Laboratory (HPL), which is considered one of the premier biomechanics training and research centres in the world.

How to Apply

Motivated and qualified candidates should submit their electronic Curriculum Vitae (CV), post-secondary transcripts and letter of interest to Dr. Ryan Lewinson at lewinson@ucalgary.ca. In your letter of interest, please include an overview of your career goals, your research and academic interests and a statement on why you believe you would be a good fit for this opportunity.