



## Seattle Institute for Biomedical and Clinical Research

October - December 2020

### SPOTLIGHT ON SCIENCE

#### WILLIAM R. LEDOUX, PHD



William R. Ledoux received his PhD in Bioengineering from the University of Pennsylvania in 1999 and has been employed since at the Center for Limb Loss and MoBility CLiMB, where he is a VA Research Career Scientist and the Director of the Biomechanical Testing and Biplane Fluoroscopy Laboratories. Dr. Ledoux is also an Affiliate Professor in the Departments of Mechanical Engineering and Orthopaedics & Sports Medicine at the University of Washington.

Dr. Ledoux's research has been devoted to preventing limb loss, either functionally or anatomically. He has used CT, MRI, motion analysis, and more recently, a custom-developed biplane fluoroscope, to quantify reduced lower limb function in different pathological foot types (flat feet and high arched). He has studied the functional aspects of various orthopaedic foot maladies using the custom developed robotic gait simulator, a unique apparatus for simulating the interaction between cadaver feet and the "ground". Additionally, he has explored functional differences between ankle fusion and ankle joint replacement for end-stage ankle arthritis. Dr. Ledoux's work on anatomical limb loss prevention has involved quantifying the mechanical, histological and biochemical differences between normal and diabetic plantar soft tissue. He has also developed a patient-specific finite element foot model, including customized anatomy and tissue properties, for the purpose of quantifying the effects of increased tissue stiffness and foot deformity on internal tissue stresses. Finally, Dr. Ledoux has explored the complex relationship between foot type and diabetic ulceration.

Most recently, Dr. Ledoux was funded by VA RR&D to quantify great toe kinematics in controls and patients with hallux rigidus using the biplane fluoroscope. In a companion project, the National Institute of Arthritis and Musculoskeletal and Skin Diseases has funded Dr. Ledoux to explore a great toe joint replacement using the robotic gait simulator. Together, these grants will provide increased understanding of the pathomechanics and treatment of great toe arthritis.

Fun fact: Outside of work, Dr. Ledoux enjoys reading, running, playing hockey and coaching all three of his kids on the ice.

#### EMPLOYEE APPRECIATION

Thank you to all SIBCR employees for your contributions and dedication to the VA/SIBCR research and education missions. And congrats to these employees celebrating anniversaries:

**25 years:** Molly Chinn,  
Research Program Manager, MIRECC

**20 years:** Danielle Fleumer, Executive Director  
Susan Lim, HR/Media Manager  
Laurie Maus, Research Coordinator, AL-MH

**15 years:** Teresita Cornell, Research Associate, CRU  
Carol Xiang, Data Manager, MIRECC

**10 years:** Wesley Chinn, Data Analyst, MIRECC  
Robert Plumley, Data Manager, HSR&D  
Jon Reid, Research Assistant, MIRECC  
Linda Robinson, Research Technician, GRECC  
Aleen Saxton, Lab Screening Manager, GRECC

**5 Years:** Alisha McCall, Sub-Committee Coordinator