“Boundary Lubricating Properties (and More) of PRG4 / Lubricin on Articular Cartilage, the Ocular Surface, and Other Biomaterials & Biointerfaces”

Presented By: Tannin Schmidt, PhD, Associate Professor of Biomedical Engineering at the University of Connecticut

Abstract: Proteoglycan 4 (PRG4), also known as lubricin, is a mucin-like glycoprotein found throughout the body in various tissues and fluids, classically defined by its boundary lubricating properties.

The overarching goal of this work is to understand the fundamental mechanisms and properties of PRG4, also known as lubricin (a critical lubricating protein found throughout the human body, recently discovered to also have anti-inflammatory properties), at relevant biointerfaces and biomaterials, and to apply that knowledge to the development of recombinant human PRG4-containing biotherapeutics and biomaterials. To accomplish this biomechanical, biochemical, and biophysical methods are employed in collaboration with biologists, engineers, and clinicians.

Four current objectives of this work are: 1) elucidating the molecular basis of synovial fluid’s articular cartilage boundary lubricating function, and providing the framework for development of PRG4-containing OA biotherapeutics; 2) understanding PRG4’s role on the ocular surface, and characterizing/developing novel PRG4-containing contact lens biomaterials and artificial tears for the treatment of dry eye disease; 3) assessing PRG4’s potential as a boundary lubricant of biomaterials for a variety of other clinical applications, e.g. orthopaedic biomaterials; 4) examining PRG4’s biological properties and its potential as a therapeutic treatment of a variety of inflammatory conditions, tissue adhesions, and cancer.

Biography: Tannin A. Schmidt, PhD, is an Associate Professor in the UCH - Biomedical Engineering Department, School of Dental Medicine, University of Connecticut Health Center. He spent 9 years at the University of Calgary prior to joining UCH, jointly appointed in the Faculty of Kinesiology and the Schulich School of Engineering, recently as a Tier II Canada Research Chair Biomedical Engineering - Biomaterials. He received his BASc in Engineering Science from the University of Toronto, his MS and PhD in Bioengineering from the University of California San Diego, and did post doctoral training in Biochemistry at Rush University Medical Centre (Chicago). His research interests in bioengineering lie within biomaterials and biotherapeutics, biomechanics, biotribology, and biochemistry. He focuses on articular cartilage and ocular surface lubrication, as well as orthopaedic and ophthalmic biomaterial development and characterization for the treatment of diseases. He is also a co-founder of Lubris BioPharma, LLC, a clinical stage biotech startup commercializing the use of recombinant human lubricin for the treatment of arthritis, dry eye, and other diseases. Novartis recently exercised an option to in-license recombinant human lubricin for ophthalmic indications worldwide (outside Europe) including the treatment of dry eye.