QUANTITATIVE & SYSTEMS BIOLOGY COLLOQUIUM:
Keep Joints Moving: Protective Films on Cartilage

Roberto C. Andresen Eguiluz
Assistant Professor, University of California, Merced



Date:
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Time:
10:30 AM – 11:45 AM

Location:
SSB 130

About The Speaker:

Dr. Roberto C. Andresen Eguiluz has been an Assistant Professor in the Department of Chemical and Materials Engineering at the University of California, Merced since July 2019. He has a degree in Mechanical Engineering from the National Autonomous University of Mexico (UNAM), a Ph.D. in Materials Science and Engineering from Cornell University, and had postdoctoral appointments at the University of Illinois at Urbana-Champaign and the University of California, Santa Barbara. His research interests center on exploring how biomolecules on surfaces and under confinement regulate adhesion and lubrication.

Abstract:

Lubricant film formation is critical during locomotion to lubricate and protect the surfaces of articulated joints from wear. The molecular components of the cartilage extracellular matrix surface provide anchoring sites for lubricating molecules, serving as a platform for assembling load- and energy-dissipative films. The role of the extracellular matrix components at the surface of articular cartilage in mediating the adsorption of lubricating and wear-protecting molecules is a key step in developing efficient biomaterials interacting with synovial fluids, as well as informing molecular strategies for joint mechanical function recovery, such as in osteoarthritis. During this seminar, I will discuss how we are: i) developing articular cartilage surface models to control molecular compositions and conformations, ii) quantifying synovial fluid component adsorption, and iii) performing nanomechanical and nanotribological characterizations to establish relationships between articular cartilage surface molecular composition and conformation, synovial fluid film formation, and tribological performance.

For more information, contact: Bercem Dutagaci
bdutagaci@ucmerced.edu