

Osteoarthritis and Biomechanics Symposium Speaker – CSB 2018

Salvatore Federico, PhD, P.Eng.

Affiliation: Department of Mechanical and Manufacturing Engineering, The University of Calgary

Title of Talk: *Continuum Modelling of Healthy and Osteoarthritic Cartilage*

Abstract: Continuum Mechanics is the study of matter at a length-scale at which the existence of the atomic structure can be neglected, and matter can be treated as continuous rather than discrete. Research in our group is devoted to the mathematical foundations of Continuum Mechanics and its applications to the Biomechanics of Soft Tissue. We are particularly interested in articular cartilage, which we model as a porous proteoglycan matrix, reinforced by a network of statistically oriented collagen fibres and saturated by the interstitial fluid. Like all biological tissues, articular cartilage can undergo growth and remodelling, which are two aspects of the same biological process. We believe that the study of the relationship between the tissue structure and its function, both in the healthy and in the diseased tissue, leads to understanding the causes of the initiation of degeneration, and suggest possible treatments to prevent disease.

Bio: Salvatore Federico received his Laurea in Mechanical Engineering in 2000 and his PhD in Structural Mechanics in 2004 from the University of Catania (Italy). In 2005, he joined the University of Calgary, where he has been a post-doctoral fellow in the Human Performance Laboratory (2005-2007) and subsequently a faculty member in the Department of Mechanical and Manufacturing Engineering and the Centre for Bioengineering Research and Education (2008-present), with an adjunct position in Kinesiology, Human Performance Laboratory (2012-present). He teaches Strength of Materials, Biomechanics, and Continuum Mechanics, and his research focuses on the mathematical foundations of Continuum Mechanics and its applications to Soft Tissue Biomechanics