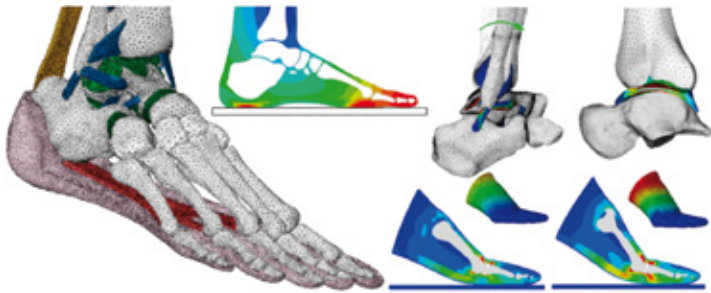
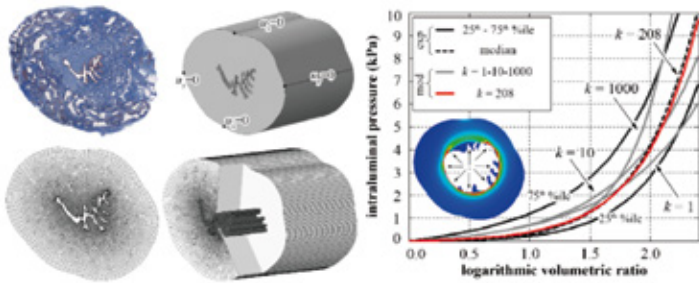


# Mechanics of Biological Tissues and Structures

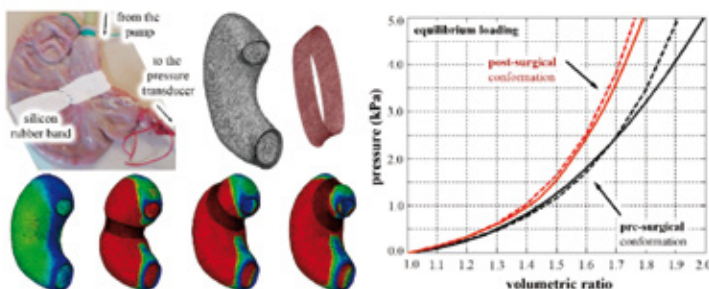
The activity is reported with reference to the Center for Mechanics of Biological Materials established at University of Padova ([www.cmbm.unipd.it](http://www.cmbm.unipd.it)). Integrated research and advanced education is performed within different departments that belong to engineering and medical area, with an interdisciplinary approach in treating the problems of biological tissues, biomaterials and biological structures mechanics. Experimental and numerical investigations are performed with regard to both hard and soft tissues. Computational mechanics approach is addressed to material and geometric non linear problems, by defining advanced constitutive formulations and procedures for parameters identification. Visco-hyperelastic, plastic, damage and multiphase models are developed with regard to different tissues, according to their histo-morphometric configuration and phenomenological functional response. Healthy and degenerated conditions are considered, investigating the evolutionary behavior caused by ageing, pathology and trauma. Modelling of complex biological structures is performed with regard to dental, foot, urological, gastroenterological, etc. mechanics. The mechanics of biological tissues is studied also with regard to phenomena occurring by the adoption of prosthetic devices, in particular evaluating the interaction phenomena occurring at tissue-implant interface, on the evolutionary healing trend or degeneration. The analysis of the mechanical response of biomaterials represents a fundamental part of the investigation, in direct correlation with the industrial design and manufacturing of biomedical devices, for evaluation of biomechanical compatibility. Extended relationships are maintained with European and North American Universities, research centers and industries, aiming at the development of international research projects.



foot biomechanics



urological biomechanics



gastrointestinal biomechanics

Bioingegneria, biotecnologia e tecnologie per la salute  
*Bioengineering*

DII research group  
Mechanics of Biological Tissues and Structures



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Main research topics:

- Integrated experimental and computational investigation of the mechanical behavior of biological tissues and structures
- Computational methods for the analysis of biomechanical functionality in healthy and degenerative conditions
- Computational tools for the design and the assessment of surgical/diagnostic procedures in correlation with medical practice
- Design and reliability investigation of biomedical devices