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# MORPHOGENESIS AND GROWTH MECHANICS OF BIOLOGICAL STRUCTURES
# TRACK NUMBER (400 - BIOMECHANICS AND MECHANOBIOLOGY)

**C. Peco[1*], F. Costanzo[2], D. Millán[3], H. Gomez[4], and K. Garikipati[5]**

[1] Engineering Science and Mechanics, Penn State University, USA (christian.peco@psu.edu)
[2] Engineering Science and Mechanics, Penn State University, USA (fxc8@psu.edu)
[3] CONICET y Facultad de Ciencias Aplicadas a la Industria, Universidad Nacional de Cuyo, Argentina (dmillan@mendoza-conicet.gob.ar)
[4] School of Mechanical Engineering, Purdue University, USA (hectorgomez@purdue.edu)
[5] Mechanical Engineering and Mathematics, University of Michigan, USA (krishna@umich.edu)

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## ABSTRACT

Biological materials are challenging to study due to their complex composition and the concomitance of different physics at several spatial and temporal scales. The mechanics of biomaterials involve the combination of solid and fluid responses, the ability to withstand large deformations, and fined tuned responsiveness to a variety of stimuli. As the characterization of isolated units/patches advances (from polymer bilayers to individual cells to vesicles) so does the interest in the emerging properties of biological material superstructure and organization. The aggregation of natural/synthetic biological units generates a new biomechanical hierarchy level, which adds a layer to its complexity and presents a whole plethora of relevant phenomena. Tissues and organisms exhibit a truly remarkable capacity to develop and adapt to different circumstances, self-organizing, and reacting to external agents. The study of these superior levels of organization is critical to 1) understand processes that we observe in nature (e.g., embryo structure forming, bacterial and fungal infections growth) and 2) to make predictions and achieving control for potential applications in engineering (targeted tissue development, tumor growth inhibition, healing materials, self-assembly). One fundamental trait of these types of structures and their evolution is that they are "bottom-up" in nature. That is, they are able to reach outstanding levels of complexity based on very simple rules, which are executed by each one of their composing units.

The goal of this minisymposium is to bring together outstanding works in the field of biological structure development, along with the arising physical, chemical, and electrical interactions with the surrounding media. We welcome contributions focusing in any of the different scales involved, comprehensive multiscale studies, and artificial intelligence applications in biomechanical growth and morphogenesis. Cell-to-cell communication, cell aggregation, tissue and infection growth, and even colony type organisms or robotic biomimetic equivalents are subject of interest of this gathering. We also encourage original contributions in the form of numerical methodologies that could improve the lens through which these phenomena are evaluated. We make extensive this call to contributions related to the development of bio-printing technology and its potential application in biomaterial analysis and tissue engineering.