

***ADVANCEMENTS IN BIOMEDICAL APPLICATIONS:
EMPOWERING ADDITIVE MANUFACTURING WITH NUMERICAL
SIMULATIONS***

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ABSTRACT

Additive manufacturing is a recent technological advancement that has significantly increased the capacity to design innovative biomedical devices, enabling personalized solution and reliable manufacturing process. We have currently access to a wide range of technologies and materials, allowing for diverse design needs. Numerical simulations can provide insight and information at different phases of the entire process chain from the clinical images of a patient to the manufacturing of the final device and its surgical implantation. An efficient end-to-end design process requires simulations of the device and its mechano-biological interaction with the host tissue, manufacturing process simulations, numerical models of the material's mechanical response, and additively manufactured devices.

The purpose of this symposium is to gather contributions in many numerical simulation domains pertaining to various facets of such a complex bioengineering context.

Scientific contributions are welcome in related area of research including, but not limited to:

- Tissue engineering scaffold design
- Multidisciplinary optimization methods
- Modeling scaffold material behavior
- Mechanobiology of scaffolds
- Predictive models for tissue regeneration within scaffolds
- Patient specific approaches to scaffold design;
- numerical simulations of manufacturing processes
- New computational methods for scaffold design, including machine learning and other artificial intelligence-based techniques.