

## DIGITAL TWINS IN TISSUE ENGINEERING

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### ABSTRACT

Tissue Engineering (TE) is opening new doors to the challenge posed by several human diseases. In TE, bioreactors and scaffolds are of paramount importance to promote and sustain adequate *in vitro* conditions for cell differentiation, proliferation, growth and support. In addition to nutrient transport and waste removal, diverse bioreactor designs have been developed to provide mechanical and/or electromagnetic stimuli to cells to enhance physical environmental conditions for specific purposes. The traditional experimental try/error approach can be aided using mathematical and computational models that mimics experimental studies. Digital twins models have been developed to computationally predict the delivered biophysical effects and define protocol standards for cell stimulation targeting growth and differentiation allowing opening new understandings with increased precision for stimulation systems. This Symposium intends to discuss the importance of biophysical parameters involved when stimulation is applied, and new developments in digital twin models in TE. Additionally, it will clarify some misunderstandings reported in the literature. These digital models contribute to reduce/eliminate experimental tests saving time, costs and animals' life.