

## **MS2-5:'Mechanics of Biomaterials: from implant to Tissue Engineering''**

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Materials for bone and joint replacement regeneration and for dental applications must resist quite demanding cyclic loading conditions for a long life span and under a specific, body, environment. It is therefore crucial to develop materials with sufficient mechanical properties and reliability, but also to design on purpose materials that can resorb at a given rate, under mechanical stresses and cell interactions.

The interaction between cardiovascular implants and the soft biological tissue of the patient is a crucial aspect to consider for the performance and outcomes of such implants. This interaction involves various materials, such as metallic, polymeric, and fabric, which can impact factors like biocompatibility, durability and overall effectiveness of the implant.

Cells are also strongly influenced by the mechanical properties and stimuli of their microenvironment. Indeed, the activation and modulation of mechanotransduction pathways are involved in tissue development and homeostasis and even in pathological processes. Thus, when developing biomaterials aimed at mimicking the native extracellular matrix for tissue engineering or for therapeutic application of implants, their mechanical features should be closely designed and characterized.

In this mini symposium, we invite submissions on the most recent advances in the study, development, and characterisation of biomaterials, including polymers, metals, ceramics and hybrid/composite materials, with specific mechanical properties designed for the development of engineered tissues and/or for effective therapeutic implantations. Experimental, computational, and theoretical studies across all length scales from micromechanical material studies to simulations of full devices, together with works on the design requirement definition, are invited.