Biomechanics of growth and morphogenesis for advanced applications

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Growth and morphogenesis are fundamental processes that drive development and maintenance of many biological structures, the comprehension of how these processes are regulated and influenced by mechanical forces representing a key aspect to unravel the complexity of biological forms and functions. By investigating the interplay between genetic information, biochemical signalling and mechanical cues, the complex mechanisms underlying tissue growth, shape changes and active remodelling can be revealed in order to shed light on the physical principles that govern living organisms' adaptation. This can be in fact advantageously exploited to hold promising implications for research in tissue engineering, regenerative medicine, developmental biology and soft robotics. In this context, exploring the role of biomechanical growth and morphogenesis provides a holistic perspective on the nature of some inherent and unique abilities of disparate biological systems to self-organize and adapt in response to mechanical stimuli, paving new ways towards advanced applications in engineering.[1]

With this in mind, this mini-symposium aims to encourage collaborations among young researchers in order to promote the progress in the multidisciplinary ground of mechanics of biological and bioinspired materials and structures. Contributions covering the following topics will be warmly welcome:

- Coupled problems in the mechanics of growth, remodelling and morphogenesis;
- Mechanobiology of single-cells and cell systems;
- Mechanotransduction and chemo-mechanical phenomena;
- Bioinspired structures and metamaterials.

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