

**Dipartimento di Biotecnologie e Bioscienze – UNIMIB**

giovedì 21 aprile, 2022, ore 16:30, aula U3-04 / Webex

# **Mechanical dysfunction in genetic-based cardiomyopathies: perspectives for the use of engineered heart tissues and biomimetic polymers**

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**Abstract:** Natural muscles provide billions of work cycles involving tension development or movement and convert the chemical energy to mechanical energy with an exceptional high efficiency. The contractile material of the cardiomyocyte may be primarily affected by gene mutations, with detrimental mechanical and energetic consequences. Faster cross-bridge detachment and increased tension cost, for instance, are hallmark of hypertrophic cardiomyopathy, identified in human myocardial samples and recapitulated by in vitromodels. Among them, human engineered heart tissues generated from induced pluripotent stem cell-derived cardiomyocytes and biomimetic polymers defined as “smart” materials.

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