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BUSTA 1 (estratta)

- Cellule staminali pluripotenti indotte: differenziamento e maturazione verso linee cellulari muscolari e di altra tipologia. Analisi dei segnali elettrici di membrana e dell'omeostasi del calcio intracellulare in cellule eccitabili e/o contrattili.
- Materiali sintetici per la rigenerazione muscolare e la crescita cellulare *in-vitro*: prospettive per l'utilizzo della stampa 3D.
- Lettura del seguente paragrafo:

T-tubule remodeling in human hypertrophic cardiomyopathy

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Abstract

The highly organized transverse T-tubule membrane system represents the ultrastructural substrate for excitation–contraction coupling in ventricular myocytes. While the architecture and function of T-tubules have been well described in animal models, there is limited morpho-functional data on T-tubules in human myocardium. Hypertrophic cardiomyopathy (HCM) is a primary disease of the heart muscle, characterized by different clinical presentations at the various stages of its progression. Most HCM patients, indeed, show a compensated hypertrophic disease (“non-failing hypertrophic phase”), with preserved left ventricular function, and only a small subset of individuals evolves into heart failure (“end stage HCM”). In terms of T-tubule remodeling, the “end-stage” disease does not differ from other forms of heart failure. In this review we aim to recapitulate the main structural features of T-tubules during the “non-failing hypertrophic stage” of human HCM by revisiting data obtained from human myectomy samples. Moreover, by comparing pathological changes observed in myectomy samples with those introduced by acute (experimentally induced) detubulation, we discuss the role of T-tubular disruption as a part of the complex excitation–contraction coupling remodeling process that occurs during disease progression. Lastly, we highlight how T-tubule morpho-functional changes may be related to patient genotype and we discuss the possibility of a primitive remodeling of the T-tubule system in rare HCM forms associated with genes coding for proteins implicated in T-tubule structural integrity, formation and maintenance.

Keywords Hypertrophic cardiomyopathy · T-tubules · Excitation–contraction coupling

BUSTA 2

- Tecniche di differenziamento, mantenimento e maturazione di linee cellulari derivate da cellule staminali pluripotenti indotte. Tecniche di misura del potenziale d'azione e dei flussi di calcio intracellulari in cellule eccitabili e/o contrattili.
- Stampa 3D di polimeri biocompatibili per l'accrescimento cellulare, la rigenerazione muscolare e la generazione di organoidi.
- Lettura del seguente paragrafo:

OPEN A versatile clearing agent for multi-modal brain imaging

SUBJECT AREAS:
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Extensive mapping of neuronal connections in the central nervous system requires high-throughput μm -scale imaging of large volumes. In recent years, different approaches have been developed to overcome the limitations due to tissue light scattering. These methods are generally developed to improve the performance of a specific imaging modality, thus limiting comprehensive neuroanatomical exploration by multi-modal optical techniques. Here, we introduce a versatile brain clearing agent (2,2'-thiodiethanol; TDE) suitable for various applications and imaging techniques. TDE is cost-efficient, water-soluble and low-viscous and, more importantly, it preserves fluorescence, is compatible with immunostaining and does not cause deformations at sub-cellular level. We demonstrate the effectiveness of this method in different applications: in fixed samples by imaging a whole mouse hippocampus with serial two-photon tomography; in combination with CLARITY by reconstructing an entire mouse brain with light sheet microscopy and in translational research by imaging immunostained human dysplastic brain tissue.

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