

The myotendinous junction plasticity following aerobic exercise

Davide Curzi, Sara Salucci, Pietro Gobbi

Department of Biomolecular Sciences, University of Urbino Carlo Bo, 61029 Urbino, Italy

The myotendinous junction (MTJ) is the site where muscle contractile force is transmitted from the myofibrils across the plasma membrane to the tendon extracellular matrix (ECM), therefore it is a key structure for the locomotor system [1]. In this work, we investigated the relationship between ultrastructural adaptations and the MTJ protein complex modulation after aerobic exercise. In particular, the answer of this anatomical interface to a month of moderate aerobic exercise has been analysed in Sprague-Dawley rats by means of confocal and transmission electron microscopy. Morphological observations confirm the exercise ability to increase the contact area between tissues, increasing the complexity of tendon finger-like processes, which penetrate into the muscle mass. Moreover, these observations suggest a possible MTJ protein complex adaptation after exercise. Confocal images, associated to an immunofluorescence quantification, confirm these ultrastructural observations. Taking together these data reveal that MTJ is a plastic interface. This plasticity can be induced by exercise, which is able to increase the contact area between tissues and to induce a protein synthesis at MTJ level.

References

- [1] Curzi et al. (2012) How physical exercise changes rat myotendinous junctions: an ultrastructural study. *Eur J Histochem.* 56: e19.

Keywords

Myotendinous junction, exercise, muscle, tendon, morphology, training