# Basic science & clinic around skeletal muscles

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In the past three years, ISMuLT has been active nationally and internationally in scientific meetings on the physiology and pathology of muscles, ligaments and tendons. This issue of Muscles, Ligaments and Tendons Journal focuses on the basic science aspects of muscles in human, in animals and in a number of *in vitro* models. Highlighting the structure and function of muscle tissue, starting from simple models, is, in fact, of great importance to understand its behavior in pathology. Muscle response to mechanical trauma or denervation, with progressive atrophy and possibly sarcopenia, appears very similar to what is well described in muscular or neuromuscular diseases. The combination of morpho-functional and biochemical approaches, together with molecular and proteomic techniques, appears crucial to identify the mechanisms underlying muscle changes in these disorders. In this issue, the role of muscle mitochondria is explored: their behaviour, crucial for the physiological function of our muscles, appears deeply modified in pathology. Many congenital muscle diseases have been described where ultrastructural and functional changes occur in the mitochondria. Interestingly, mitochondrial involvement in muscles has been reported in a murine model of Down syndrome. Cell death and apoptosis have been recognized as a peculiar pathogenetic mechanism in a number of muscle disorders. This response has been experimentally induced in *in vitro* murine myoblasts and differentiated myotubes, and characterized in a variety of experimental models. Apoptotic and necrotic cell deletion has been identified and investigated: autophagy, a recently described process of cell survival, seems to modulate the phenomenon, and has been proposed to justify the resistance of differentiated muscle to cell death stimuli. Myotendinous junction is a highly specialized structure, which connects skeletal muscle to the tendon, and, with its changes in physical exercise, represents a very interesting entity both from a biological and functional point of view. Its progressive modifications in developing rats, from birth to adulthood, has been described by ultrastructural and morphological techniques. Rhabdomyolysis occurs in a variety of conditions, including trauma, extreme temperatures, drug treatments, exposure to toxins, as well as myopathies, has been here discussed. A review, with a wide reference report, describes clinical aspects, complications, treatment and prognosis. We hope that this issue could represent a stimulating occasion to better deepen the knowledge on skeletal muscle biology. We need to understand physiology to shed light on pathology: this issue puts the bases for a translational approach to conditions affecting skeletal muscle. Have fun!

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