ABSTRACT

Title:
Fibro-adipogenic precursors (FAPs): novel players in muscle plasticity.

PI and name of the lab:
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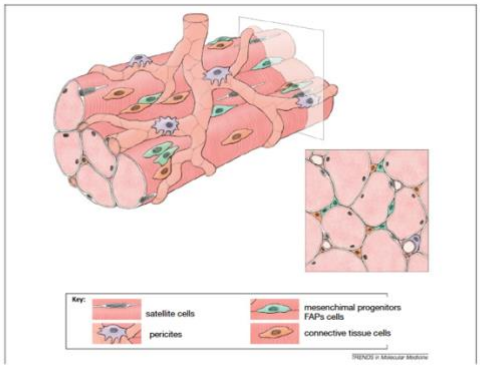
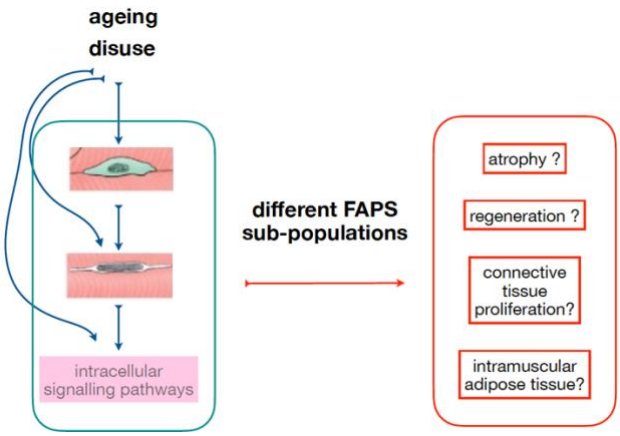
Research Theme/Topic:
Physiology, Cell biology, Regenerative medicine

Main Abstract:
Skeletal muscle plasticity is of paramount importance in muscle and whole body homeostasis. Muscle mass can increase in response to contractions against high loads, shrink when loading or neuromuscular activity are decreased and regenerate after injury. Most studies on muscle plasticity focused on muscle fibers and satellite cells, i.e., muscle stem cells. Indeed, adaptations of muscle mass and function are modulated by a complex network of signals within muscle fibers. Satellite cells are necessary for hypertrophy, donating nuclei to muscle fibers, and for repairing or regenerating damaged or necrotic muscle fibers following injury or diseases.
However, besides satellite cells, a relevant population of interstitial adult stem cells exists. Indeed, 19% of nuclei in a muscle belong to one of such populations, namely to fibro-adipogenic precursors (FAPs).
Although FAPs do not directly regenerate muscle fibers, they are necessary for the regenerative function of satellite cells and play a key role in muscle integrity and function engaging in a complex network of cellular interactions through autocrine and paracrine signaling. They could be major players in orienting muscle adaptions towards **muscle mass maintenance and regeneration** or towards **maladaptive phenomena** such as muscle replacement by connective and adipose tissue. FAPS comprise many subpopulations with likely different roles.
The project will address the **role of FAPS and of their subpopulations** in muscle adaptations to conditions such as **ageing** and **disuse** relating analyses of FAPS subpopulations, satellite cells, intracellular signaling pathways and of structural and functional features of skeletal muscle from human and mice models.





Techniques:
High resolution microscopy, antibody staining, cell culture, cell sorting, RT-PCR, proteomics, analysis of muscle fibres contractile and metabolic function.