BDR SEMINAR in Kobe

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Pompeu Fabra University (UPF) and ICREA

Tuesday, March 12, 2019

16:00-17:00, 7F Seminar Room, DB Building A

Understanding muscle stem cell regenerative decline with aging

Summary

Skeletal muscle has a remarkable capacity to regenerate by virtue of its resident Pax7-expressing stem cells (satellite cells), which are normally quiescent in the adult. Upon injury, quiescent satellite cells activate and proliferate, to subsequently differentiate and form new myofibers or self-renew to restore the quiescent satellite cell pool. Through a combination of global gene expression/bioinformatics and molecular/cellular in vitro and in vivo assays, we found that resting adult satellite cells have basal autophagy activity and are subjected to circadian control, and that they undergo circadian reprogramming with aging. Interestingly, autophagy was identified as one of the intracellular processes that are oscillatory in adult, but not aged, muscle stem cells. Thus, we propose that, through controlling distinct activities, proteostasis maintains muscle stem cell homeostasis and rhythmicity, while its decay is causally implicated in stem cell aging, a process that can be targeted for rejuvenation.

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