DSV Seminars 2020

UNIVERSITÀ DEGLI STUDI DI TRIESTE

DIPARTIMENTO DI SCIENZE DELLA VITA

PhD Program in Molecular Biomedicine

Thursday, 16 January 2020 - 12:00

ICGEB Seminar room, W Building
Area Science Park, Padriciano 99 – Trieste

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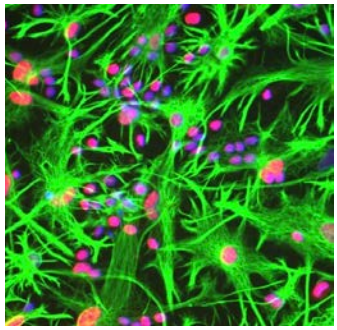
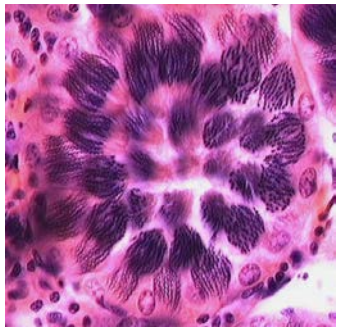


Host: Giannino del Sal

Power, metabolism and dysfunction: mitochondria in age-related diseases



Metabolism is the set of life-sustaining reactions in organisms. These biochemical reactions are organized in metabolic pathways, in which one metabolite is converted, through a series of steps catalyzed by enzymes, in another chemical compound. Metabolic reactions are categorized as catabolic, the breaking down of metabolites to produce energy, and/or anabolic, the synthesis of compounds that consume energy. The balance between catabolism of the preferential fuel substrate and anabolism define the overall metabolism of a cell or tissue.
Metabolomics is a powerful tool to gain new insights contributing to the identification of complex molecular mechanisms in human and animal cells. The long-range goal of my laboratory is to understand how metabolism is rearranged during the development of age-related diseases. In particular, we focused our attention on the role of mitochondria that represent the energy-generating hubs of the cell in a cellular model of neuron and adipocyte differentiation. The use of specific metabolic inhibitors as well as knock-down of a key protein regulating mitochondrial function coupled to steady-state and dynamic metabolomic analyses unraveled metabolic re-wiring of neuroblasts in the maturation to neuron and of mesenchymal stem cells in the transition to adipocytes. Results in these models highlighted the key role of mitochondria and energy metabolism to allow proper differentiation process. These are powerful studies to disentangle metabolic re-arrangements in the transition from physiology to pathophysiology as neurodegeneration and obesity/type II diabetes development.