

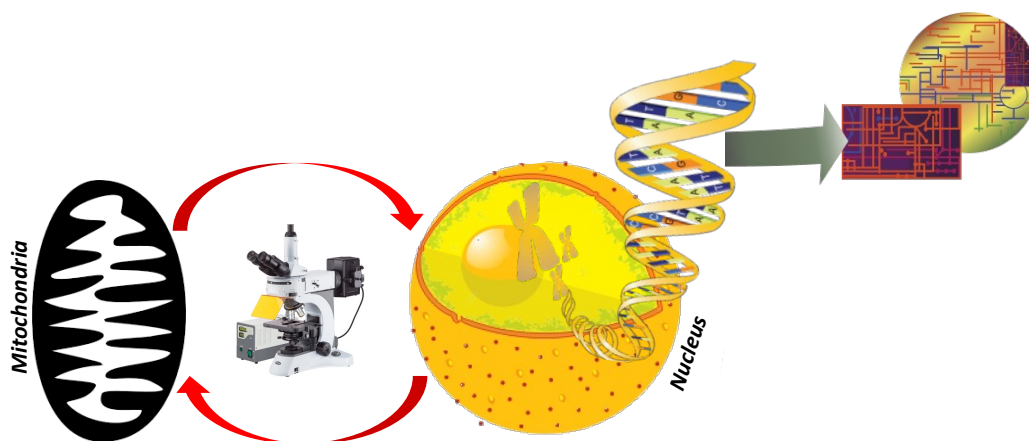
Title: Investigating the transcriptional regulation of Mitochondria-related nuclear genes

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Background:

The relationship between nucleus and mitochondria is crucial for metabolic and, more generally, cellular homeostasis. In fact, these two organelles continuously exchange information in order to coordinate their functions. Despite the importance of this functional relationship, our knowledge on the identity and roles of the signaling cascades involved in nucleus-mitochondria communication, but also on the importance of the relative spatio-temporal distribution of the two organelles remains limited. The PhD student will develop a series of sensors for the detection of mitochondrial and nuclear signals but also of modulators of the relationships between the two organelles which can be used in live cells. Once this toolbox of "molecular tools" has been validated, the PhD student will interfere with nucleus-mitochondria communication and will follow how its actions alter the transcription of mitochondrial genes expressed by the nucleus through single cell sequencing.

At the end of this path the PhD student will have a multidisciplinary training having acquired techniques and topics in the areas of signaling and Cell physiology and Molecular biology.



Techniques: Real-time live cell and organelle imaging, cell culture, Nucleic acid isolation, confocal microscopy, transcriptome analysis, gene silencing, western blotting.