

Interfacing organelles and cell physiology via ion channels: from biophysics to therapy

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Although over 80% of transport processes occur inside the cells, the ion flux mechanisms across intracellular membranes remain at the moment poorly understood. The importance of organellar channels is becoming increasingly evident since they are involved in many different pathologies, ranging from neurodegenerative diseases to ischemia, viral infections, diabetes and cancer. Molecular identification of many of these ion channels/transporters has made it possible to study their physiological functions by genetic and pharmacological manipulation. Importantly, in vitro and in vivo pharmacological targeting of diverse intracellular ion channels, e.g. in various cancer models, illustrate the great potentiality of exploiting these proteins and promote them to the class of promising targets against various pathologies. During the Ph.D. project, the function of two specific mitochondrial ion channels will be studied in the context of cancer models and of neurodegenerative diseases. The final aim is to identify new small molecules with possible therapeutic application against these diseases. The student will have the opportunity to learn different techniques ranging from biophysics to in vivo experiments and will benefit from national and international collaborations of the group.