

CV

I am currently a PhD student in Medicine and Experimental Therapies at the University of Perugia. My scientific path has been driven by a strong and growing interest in ion channel physiology, which has progressively shaped my research focus and experimental expertise.

I obtained my Master's degree in Biology at the University of Perugia, where my thesis focused on the role of astrocyte-derived small extracellular vesicles in glioma growth. During my predoctoral training, I conducted research on ion channels involved in cancer cell physiology, particularly Ca^{2+} -activated potassium channels and mechanosensitive channels such as Piezo1, investigating their contribution to cell volume regulation, survival, and adaptation to microenvironmental stress in glioblastoma models.

Through this work, I developed solid experience in patch-clamp electrophysiology, integrated with molecular and cellular biology techniques, including qPCR, Western blotting, immunocytochemistry, and functional assays. I further strengthened my research background during an Erasmus traineeship at the Max Planck Institute for Multidisciplinary Sciences, where I studied the role of ion channels in cancer within an international and multidisciplinary environment.

This research background and my passion for ion channel biology naturally led me to my current PhD project focused on CFTR, a key ion channel in epithelial physiology and disease. My doctoral research aims to investigate CFTR function and regulation using an integrated experimental approach, with the goal of contributing to a deeper understanding of ion channel-mediated mechanisms in pathological conditions.

LAB EXPERTISE

During my research activity, I have developed strong expertise in ion channel physiology and cellular electrophysiology, with a particular focus on the role of ion channels in pathological conditions. My work has been primarily conducted on glioblastoma cellular models, where I investigated how ion channels contribute to cell volume regulation, survival, and adaptation to microenvironmental stress.

I performed patch-clamp electrophysiology experiments to study the functional properties of Ca^{2+} -activated potassium channels, mechanosensitive channels such as Piezo1, and other ion conductances involved in tumor cell physiology. These studies were integrated with molecular and biochemical approaches, including qPCR, Western blotting, and immunocytochemistry, allowing me to correlate ion channel activity with expression levels and signaling pathways.

A significant part of my research focused on mechanotransduction mechanisms, investigating how hypoxic conditions activate the Piezo1/IK axis and modulate cell volume regulation and cell survival. In parallel, I studied the role of astrocyte-derived small extracellular vesicles in glioblastoma,

analyzing their impact on tumor growth and ion channel modulation, thus incorporating cell–cell communication into the study of tumor physiology.

In addition to experimental work, I gained experience in electrophysiological data analysis and ion channel modeling, applying Markov models to investigate the inactivation processes of wild-type and mutant hERG channels, and correlating functional data with structural and computational analyses.

This experimental background provided the foundation for my current **PhD project focused on CFTR**, where I am applying electrophysiological, molecular, and functional approaches to study **CFTR regulation and activity** in epithelial models, with the aim of understanding its role in disease and its potential as a therapeutic target.