

# Understanding Ion Channel Activity



Francesco Tombola

Assistant Professor, Physiology & Biophysics, School of Medicine

## CURRENT RESEARCH

How targeting ion channels may hold solutions to combat strokes, cancers, and neurological diseases

Our body is made of trillions of cells, that share the same DNA blueprint but are specialized to perform different tasks. As in a society made of multiple individuals, our cells need to constantly exchange information to coordinate their activities, while being aware of their surroundings at all times. But how does a cell detect and process information from the external world? Dr. Francesco Tombola, Assistant Professor of Physiology & Biophysics at University of California, Irvine, addresses this fundamental question, focusing on molecular events that happen at the plasma membrane, the interface between the "inside" and the "outside" of the cell. Understanding how cells in our body receive and process information from their surroundings through the activation of membrane proteins known as ion channels will provide new pharmacological targets for treating many diseases, including cancer, stroke, autoimmunity, and autism spectrum disorders.

Membrane proteins, or ion channels, allow ions to enter or exit the cell when properly activated by a stimulus. The movement of ions then triggers important biological processes such as muscle contraction, hormone release, cellular proliferation, migration, or differentiation. Malfunctioning ion channels can thus render a cell unable to detect external signals, or cause the cell to respond to signals in the wrong way, for example by proliferating excessively, by migrating to the wrong location, or by shutting down defenses against invading pathogens. In collaboration with prominent researchers like Drs. [Medha Pathak](#) and Lisa Flanagan at UC Irvine and with the...

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## AFFILIATION



University of California, Irvine

## EDUCATION

- Postdoctoral in Biophysics 2008, University of California, Berkeley
- Postdoctoral in Biophysics 2003, University of Padua, Italy
- Ph.D. in Cell Biology & Pathology 2001, University of Padua, Italy
- B.S., M.S. in Chemistry 1994, University of Padua, Italy

## AWARDS

- American Heart Association WSA Postdoctoral Fellowship, 2004-2006
- University of Padua Postdoctoral Fellowship, 2002
- Young Researcher Award of the University of Padua, 2001
- Italian National Research Council Fellowship, 2001
- Doctoral Fellowship of the Italian Ministry of Education, 1997-2000

## RESEARCH AREAS

Life Science, Immunology / Inflammatory, Neurological / Cognitive, Regenerative Medicine

## FUNDING REQUEST

Your contributions will support the continued research of Dr. Francesco Tombola at University of California, Irvine, as he probes membranes proteins to understand their mechanisms and design therapeutics. Donations will help fund the \$500K/year required to support personnel, experiment supplies, and the cutting-edge instrumentation involved in this research. Partner with Dr. Tombola to identify new targets through ion channels, for cancer, stroke, neurodegenerative diseases, and autism spectrum disorders!