

The Mechanobiology of Ion Channels: May the Force Be with You!

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Venue: Ming Wai Lau Centre for Reparative Medicine, Science Park, Sha Tin

Please register by emailing mwlc@ki.se

Abstract

Opening of stretch-activated ion channels (SACs) is the earliest event occurring in mechanosensory transduction. The molecular identity of mammalian SACs has long remained a mystery. Only very recently, Piezo1 and Piezo2 were shown to be essential components of distinct SACs and moreover, purified Piezo1 forms non-selective cationic channels (i.e. permeable to sodium, potassium and calcium) when reconstituted into artificial bilayers. Human mutations in Piezo1/2 are associated with a variety of disease states, including xerocytosis, lymphatic dysplasia, arthrogryposis and muscle contracture. In addition, the 3D structures of mechanosensitive two-pore domain potassium channels (K_{2P}) TREK1/2-TRAAK (i.e. selective for potassium), as well as Piezo1, have recently been solved, providing valuable information about selectivity and gating mechanisms of SACs. These recent studies allow a better understanding of the molecular basis of cellular mechanotransduction. I will review these new “exciting” findings, which hopefully will pave the road for the identification of novel therapeutic strategies.



Biography

Prof Eric Honoré is the Director of Research at the Institute of Molecular and Cellular Pharmacology of the “Centre National de la Recherche Scientifique (CNRS)” in Valbonne, France. In 1986, he received a PhD in Physiology from the University of Lille (France). During his doctoral work, performed in part at the University of Calgary (Canada), he studied cardiac electrophysiology. During his postdoctoral work at the University of Bordeaux (France), he focused on smooth muscle ion channels. After moving to the University of Nice-Sophia Antipolis (France) in 1989, he studied molecular physiology and pharmacology of K^+ channels in the laboratory of Prof Michel Lazdunski. Eric Honoré was a visiting scientist for two years (1995-1996) at the laboratory of molecular embryology directed by Dr Ali Hemmati-Brivanlou, Rockefeller University (NY, USA). Dr Honoré is currently the head of the renovascular physiopathology group at the IPMC-CNRS (Valbonne, France). *More info:* <https://www.ipmc.cnrs.fr?page=honore>