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Cross-talk between two partners regulates the gating of the KATP channel pore

Hussein Nori Rubaiy
University of Leeds, UK

ATP-sensitive potassium (KATP) channels, which are unique among potassium channels are ubiquitously expressed and link metabolic state to electrical excitability. KATP channels are crucial in the regulation of glucose-induced insulin secretion. In pancreatic β-cells, an increase in ATP/ADP ratio, which is generated by glucose uptake and metabolism, closes the KATP channels to elicit membrane depolarization, calcium influx and a secretion of insulin, the primary hormone of glucose homeostasis. KATP channels are composed of a hetero-octamer of two subunits types, a pore forming Kir6 subunit, which is a member of the inwardly rectifying potassium channel family and a sulfonylurea receptor (SUR), a regulatory subunit, which is a member of the ATP binding cassette family of proteins. In response to nucleotides and pharmaceutical agonists and antagonists, SUR allosterically regulates KATP channel gating. More than three decades after the discovery of KATP channels, the transduction pathways for allosteric communication, which make the functional link between the pore forming Kir6 and the regulatory SUR subunits of KATP channels, remain poorly understood. A crystal structure of KATP channels will clarify the allosteric communications and the structure-function relationship between KATP channels subunits, which induce the conformational changes and the channel gating.

Biography

Hussein Nori Rubaiy has completed his Pharmacy degree from Uppsala University and has several years of experience as a Registered Pharmacist in Sweden. He has completed his Master's degree from Karolinska Institute and PhD from University of Leicester, School of Medicine. He continued with Post-doctoral studies at Dalhousie University, Canada and currently at University of Leeds. His research interest includes drug discovery to study the molecular mechanisms of ion channels in diseases to develop a novel or deliver better ion channel-based therapeutic targets for human disorder and diseases.

h.rubaiy@leeds.ac.uk

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