Ion Channels in Disease and Health

Guest Editor

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Message from the Guest Editor

Dear Colleagues,

Ion channels are membrane-spanning proteins, often associated with auxiliary subunits, mediating the selective permeation of ion species and allowing the movement of charges, depending on the electrochemical gradient. Importantly, they participate in determining plasma membrane potential and as such are critical for the activity of excitable cells in excitation-contraction, excitation-secretion or excitation-expression couplings. Their roles in non-excitable cells are also recognized in regulating the homeostasis of ions, and by this way, the transport of metabolites, the control of cell volume and related functions such as cell proliferation or apoptosis.

Mutations in ion channel genes or alterations of their expression/function can alter ion flow, disrupt the electrochemical balance and water flow regulation. Therefore, abnormalities or dysregulations in ion channels, or their regulatory subunits, have been associated with various disorders, including epilepsy, ataxia, diabetes mellitus, cardiac arrhythmia, cystic fibrosis, cancer. Ion channels are thus important therapeutic targets and attractive structures in drug discovery.

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