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Electrochemistry

A NEW CURRENT EXPRESSION FOR SELECTIVE ION PERMEATION ACROSS MEMBRANES

S. V. TALEKAR, D. C. MIKULECKY* *and* C. M. GARY-BOBO†

Department of Biophysics, National Institute of Mental Health and Neurosciences, Bangalore-560 029, India

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Classical Nernst-Planck electrodiffusion approach to selective ion permeation through membranes, remains currently a popular approach to the problem. Some attempts have however been made to use Eyring's theory to explain selective ion permeation through the trans-membrane channels. The common problem with either approaches is that the final expression for ionic current does not have selectivity inbuilt, rather selectivity is introduced in the current equation as an arbitrarily chosen parameter. To the best of our knowledge, we describe, for the first time in literature a selective ion-current equation within the framework of Statistical Mechanics approach to a level of first degree approximation.

Keywords: Nernst-Planck Electrodiffusion; Ion Permeation; Membrane; Eyring's Theory; Ion-current Equation

*Department of Physiology, Medical College of Virginia, Virginia Commonwealth University MCV Station, Richmond, Virginia 23298, USA.

†Service de Biophysique—Department de Biologic Centre D' Etudes Nucleaires de Saclay, Commissariat a L' energie Atomique. BP 2 Gif-Sur-Yvette 91 1 90/France/.