

Conductance of Ideally Cation Selective Channel Depends on Anion Type

¹Torri C. Roark, ²Philip A. Gurney, ¹Horia I. Petrache, ³Sergey M. Bezrukov

¹Department of Physics, Indiana University Purdue University Indianapolis, Indianapolis, IN

²Department of Physics, University of Massachusetts, Amherst, Massachusetts

³National Institute of Child Health and Human Development, National Institute of Health, Bethesda, Maryland

Gramicidin A (gA) is a transmembrane, cation selective ion channel that has been used in many biophysical studies of lipid bilayers, in particular for investigations of lipid-protein interactions and membrane electrostatics. In addition, it was found that ionic interactions with neutral lipid membranes also affect the kinetics of gA channels. Here we report measurements of gA ion-channels for a series of sodium and potassium salts that show an *anion*-dependence of gA conductance. We find that gA conductance varies significantly with the anion type with ClO_4 and SCN producing distinctly larger conductance values than Cl , F , and H_2PO_4 . These results can provide new insights into ion-lipid membrane interactions and ion channel functions in general.

Philip A. Gurney, ²Department of Physics, University of Massachusetts, Amherst, Massachusetts

Horia I. Petrache, ¹Department of Physics, Indiana University Purdue University Indianapolis, Indianapolis, IN

Sergey M. Bezrukov; National Institute of Child Health and Human Development, National Institute of Health, Bethesda, Maryland