1154-92-1480 **Owen L Lewis*** (olewis@math.fsu.edu) and **James P Keener**. *Enhanced electrodiffusive transport across a mucus layer.*

Diffusive transport of small ionic species through mucus layers is a ubiquitous phenomenon in physiology. However, some debate remains regarding how the various characteristics of mucus (charge of the polymers themselves, binding affinity of ions with mucus) impact the rate at which small ions may diffuse through a hydrated mucus gel. Indeed it is not even clear if small ionic species diffuse through mucus gel at an appreciably different rate than they do in aqueous solution. Here, we present a mathematical description of the transport of two ionic species through a mucus layer based on the Nernst-Planck equations of electrodiffusion. Through novel application of classical techniques, steady state fluxes of ionic species are quantified, as are their dependencies on the chemical properties of the mucus gel and the composition of the bath solution. We outline a mechanism for generating enhanced diffusive flux of hydrogen across the gel region, and hypothesize how this mechanism may be relevant to the apparently contradictory experimental data in the literature. (Received September 15, 2019)