1173-92-202 **Christopher Boon***, cboon1@students.kennesaw.edu. *Mathematical Model of Confined Mammalian Cell Migration.* Preliminary report.

Cell migration plays a fundamental role in biological processes such as wound healing, cancer metastasis, and morphogenesis. Cells utilize different mechanisms for migration depending on their microenvironment. On two-dimensional surfaces, migration is driven by actin polymerization. While in confined channels with high hydraulic resistance, migration can be driven by water permeation. Water permeation is driven by a polarized distribution of membrane proteins, including ion channels and aquaporin. Taking cancer metastasis as an example, breast cancer cells are known to have an overexpression of ion channels and pumps and sometimes migrate through confined environments that have elevated hydraulic pressure. This suggests that breast cancer cells can migrate in an ideal environment for the use of water permeation. Despite the important role of ion and water transport in cell migration, the mathematical formulation of this mode of migration is relatively new. There are few models that allow the study of how ion and water fluxes through ion channels affect cell migration. We develop a single-cell based model for cell migration capable of studying directional solute fluxes. Model components are modeled by a set of coupled differential equations and are numerically solved in MATLAB. (Received September 20, 2021)