Abstract Submitted
for the DFD08 Meeting of
The American Physical Society

Migration of Connexin in the Membranes of Living Cells: Computational Method KARL MAY, DAHARSH RANA, MATTHEW BLEDSOE, AUDREY HAMMACK, JENNIFER KREFT, University of Texas at Tyler — The membranes of living cells are semi-permeable layers that contain phospholipids and numerous proteins. Connexin, specifically, is a gap-junction protein found in the membrane that is imperative in the communication between cells. We utilized a lattice Boltzmann simulation to model the motion of connexin within a cellular membrane. The phospholipids are considered a uniform fluid in the simulation. The model membrane contains solid obstacles that impede the movement of connexin, thus causing the protein to become trapped in domains for various periods of time. The results from the computational model have been used to quantitatively match the results of an experiment involving cells with connexin labeled by green fluorescence protein. We also use the simulation to investigate different mechanisms by which connexin migrates to the point of contact between cells.

Karl May
University of Texas at Tyler

Date submitted: 27 Jul 2008 Electronic form version 1.4