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**Bernardo A Hernandez Adame\*** (bernardo.a.hernandez.adame@gmail.com), 70 Pacific St. #484A, Cambridge, MA 02132, and **Erin Stafford, Amanda McAdams** and **Jonathan Galvan Bermudez**. *Cellular-Scale Modeling of Oncogenic Proteins*.

Mutations in the RAS family of proteins have been implicated in roughly 25% of all human tumors and up to 90% in certain types of cancerous tumors, such as pancreatic cancer, as mutations can lead to overactive signaling in cells preventing cell death and leading to tumor growth. In order to better understand the dynamics of RAS protein interactions with the cell membrane and RAF proteins, we constructed a combination of an atomistic and a continuum scale mathematical model. The various interactions are incorporated into the model through a "free energy" functional, which describes the available work in this thermodynamic system. Furthermore, using dynamic density functional theory, we derive the evolution equations describing the changes in the membrane's lipid concentrations, the membrane's height, and the proteins' positions. A sensitivity analysis is then conducted on the parameters of the interactions due to the uncertainty in these values, as well as providing various simulations of the membrane evolution under the mutated proteins. (Received September 21, 2018)