1154-D5-896 **Keisha Cook*** (kcook7@tulane.edu), New Orleans, LA 70125. *Stochastic modeling in cellular internalization and transport.* Preliminary report.

Live cell imaging and single particle tracking techniques have become increasingly popular amongst the mathematical biology community. We study endocytosis, the cellular internalization and transport of bioparticles. We are specifically interested in titanium dioxide nanoparticles (TiO_2) in human lung cells (A549), observed locally in enlarged lysosomes. We want to determine if the change in the size of the lysosomes alters transport type. Using fluorescence microscopy, we track, classify, and analyze the movement in the cells. Single particle tracking techniques allow us to collect data in order to develop statistical methods for analyzing the movement in the cells. We classify the movement as active, diffusive, sub-diffusive, or stuck. The standard method to compute the diffusivity and velocity involves the mean squared displacement formula. Mathematically, we use Bayesian inference methods to infer a credible region of values for the diffusivity and velocity. Specifically, we develop a Gamma distribution for diffusivity and a Normal distribution for velocity, then sample from both using the Gibbs Sampler technique. Our application shows short path trajectories. Do short particle tracks provide enough information to tell us if they exhibit the properties of Brownian Motion? (Received September 11, 2019)