1154-60-1200 **Danielle Middlebrooks*** (dmiddle1@math.umd.edu), MD. *Quantifying Flows in Time-Irreversible Markov Chains: Application to a Gene Regulatory Network.*

Transition path theory (TPT) is a framework used to study the statistical properties of reactive trajectories. Reactive trajectories are those trajectories by which a random walker transits from one subset in the state-space to another disjoint subset. We develop analytical and computational tools based on TPT in order to quantify flows in time irreversible Markov Chains. These tools are applied to a gene regulatory network modeling the dynamics of the Budding Yeast cell cycle. (Received September 13, 2019)