1154-92-846 **Lauren Johnson Dickman*** (lrjohns7@asu.edu), 900 S. Palm Walk, Tempe, AZ 85281. *Tumor control, elimination, and escape through a compartmental model of dendritic cell therapy for melanoma.*

Melanoma, the deadliest form of skin cancer, is regularly treated by surgery in conjunction with a targeted therapy or immunotherapy. Dendritic cell therapy is an immunotherapy that capitalizes on the critical role dendritic cells play in shaping the immune response. We formulate a mathematical model employing ordinary differential and delay-differential equations to understand the effectiveness of dendritic cell vaccines, accounting for cell trafficking with a blood and tumor compartment. We reduce our model to a system of ordinary differential equations. Both models are validated using experimental data from melanoma-induced mice. The simplicity of our reduced model allows for mathematical analysis and admits rich dynamics observed in a clinical setting, such as periodic solutions and bistability. We give thresholds for $\mathcal{R}_0$ that ensure tumor elimination. Bistability emphasizes a need for more aggressive treatment strategies, since the reproduction number below unity is no longer sufficient for elimination. A sensitivity analysis exhibits the parameters most significantly impacting the reproduction number, thereby suggesting the most efficacious treatments to use together with a dendritic cell vaccine. (Received September 11, 2019)