

1135-VN-2213 **Jacob S. Menix*** (jacob.menix841@topper.wku.edu). *Using Computational Bayesian Statistics to Analyze Parameters in a Differential Equation Model*. Preliminary report.

The purpose of this project is to use Bayesian statistics to analyze values of parameters for a previously developed system of ordinary differential equations which describes the healing process of diabetic foot ulcers. The model describes the relationships between matrix metalloproteinases, their inhibitors, and extracellular matrix. A Bayesian approach is used when the availability of data is sparse, as it is in this case. Delayed Rejection Adaptive Metropolis (DRAM), a MATLAB implementation of a Metropolis-Hastings algorithm, is used to estimate parameters. Using this approach with the individual patient data allows us to refine the parameter estimates, find associated confidence intervals using parameters' posterior distributions, and compare pairwise plots of parameters. This will help improve the wound-healing model in order to better predict wound-healing outcomes for individual patients. (Received September 25, 2017)