



May 30th, 4:00 PM - 4:30 PM

Parameter estimation for a model of peritonitis focusing on the sequential immune cell response

Marcella Torres

Virginia Commonwealth University, torresmm@vcu.edu

Angela Reynolds

Virginia Commonwealth University

Rebecca Segal

Virginia Commonwealth University

See next page for additional authors

Follow this and additional works at: <https://scholarscompass.vcu.edu/bamm>

 Part of the [Life Sciences Commons](#), [Medicine and Health Sciences Commons](#), and the [Physical Sciences and Mathematics Commons](#)

<https://scholarscompass.vcu.edu/bamm/2018/wednesday/8>

This Event is brought to you for free and open access by the Dept. of Mathematics and Applied Mathematics at VCU Scholars Compass. It has been accepted for inclusion in Biology and Medicine Through Mathematics Conference by an authorized administrator of VCU Scholars Compass. For more information, please contact libcompass@vcu.edu.

Presenter Information

Marcella Torres, Angela Reynolds, Rebecca Segal, and Shobha Ghosh

Parameter estimation for a model of peritonitis focusing on the sequential immune cell response

Macrophages can be activated to a more inflammatory M1 phenotype or to an M2-like phenotype which promotes the resolution of inflammation. Problems with this phenotypic switch can result in a population imbalance that leads to chronic wounds or disease. We have developed a model for the sequential influx of immune cells in the peritoneal cavity in response to a bacterial stimulus that includes macrophage polarization. With this model we are able to reproduce the expected timing of sequential influx of immune cells and mediators in a general inflammatory setting. Weighted least-squares parameter estimates were obtained for this data (scaled) using trust region optimization in logarithmic parameter space. We then explore local structural and practical identifiability of the proposed model *a posteriori*, and obtain an identifiable subset of parameters for simulation of treatments.