



Virginia Commonwealth University  
VCU Scholars Compass

---


Biology and Medicine Through Mathematics  
Conference

---

## Global Sensitivity Analysis of a Physiologically-based Pharmacokinetic (PBPK) Model of Bromochloromethane

Colton Sawyer  
*Southern New Hampshire University, c.sawyer1@snhu.edu*

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/2020/talk/41>

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](mailto:libcompass@vcu.edu).

Title: Global Sensitivity Analysis of a Physiologically-based Pharmacokinetic (PBPK) Model of Bromochloromethane

Presenter: Dr. Megan Sawyer, Southern New Hampshire University

Abstract: Physiologically-based pharmacokinetic (PBPK) models often rely on the use of “expert opinion” to determine subsets of parameters for optimization. However, confidence in mathematical models is highly dependent on the ability to verify each component of the model in the absence of such an expert opinion. Global sensitivity analysis (GSA), the study of uncertainty in outputs of a model by searching a parameter input space, can serve as a de facto expert opinion for researchers. In particular, GSA can indicate the effects changing a presumed-constant parameter can have on the overall model, allowing the experimental designer to consider the advantages and disadvantages of including various parameters in the estimation set.

Using a previously published model of bromochloromethane, this talk will explore and present visualizations of several GSA methods including one-at-a-time and variance-based methods. This work was conducted with undergraduates during a semester-long course and as independent research projects.