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| **Madeleine S. Gastonguay**  [Madeleine.Gastonguay@uconn.edu](mailto:Madeleine.Gastonguay@uconn.edu)  <https://madeleine-gastonguay.netlify.app/> | **Insert professional profile here:**  I am an aspiring systems biologist looking for a graduate program where I can develop my skills as an independent researcher and thinker…… |

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| **Education**  **BS in Applied Mathematics, University of Connecticut, May 2020**   * Summa Cum Laude with Honors in the Major * Bioinformatics Minor   **Grants and Awards**   * Summer Undergraduate Research Fund Trimble Family Award, University of Connecticut * Holster Scholar, University of Connecticut   **Skills & Certifications**   * R, Python, Matlab, Unix, LaTeX * Carpentries Instructor Certification, in progress   **Research Experience**  **The Jackson Laboratory Churchill Lab,** Bar Harbor, ME  **Research Data Analyst I** (June 2020 – present)  Topic: A Bayesian approach to mediation analysis of complex traits with measurement noise  Advisor: Gary Churchill, PhD   * Contributing to construction and validation of an R package for Bayesian model selection (bmediatR) * Extending bmediatR to include moderated mediation * Uncovering the effect of measurement noise on mediation analysis * Building a Bayesian model to incorporate prior knowledge of measurement noise to increase the accuracy of mediation analysis   **Center for Quantitative Medicine, UConn Health Center,** Farmington, CT  **Undergraduate Research Assistant** (September 2018 – May 2020)  Topic: A quantitative pipeline for cancer reversion analysis in triple negative breast cancer  Advisor: Paola Vera-Licona, PhD   * Constructed a static intracellular signaling network for a claudin-low triple negative breast cancer (CL TNBC) cell line with multi-omics data using Cytoscape and GeneXplain * Applied a structure-based control method for nonlinear systems to identify putative control targets * Approximated the attractor landscape of the static network and conducted virtual screenings of concerted perturbations of control targets using a topological estimation of signal flow * Identified perturbations resulting in reversion of the CL TNBC phenotype through machine learning clustering and classification methods | **Research Experience Con’t**  **Metrum Research Group,** Simsbury, CT  **Summer Intern** (June 2018-August 2018)  Topic: Developing an open and general maternal-fetal physiologically based pharmacokinetic model for drugs metabolized by cytochromes P450 isoenzymes  Advisor: Ahmed Elmokadem, PhD   * Described the physiological pharmacokinetics of midazolam, metoprolol, and caffeine in nonpregnant women with a system of differential equations with *mrgsolve* * Extended the model for nonpregnant women to predict maternal and fetal drug exposures at different gestational ages by incorporating anatomical, biochemical, and physiological changes a woman undergoes throughout pregnancy * Calibrated the model with local sensitivity analysis and optimization of model parameters * Validated the model by comparing predicted concentration profiles to published data for several other drugs metabolized by cytochrome P450 isoenzymes   **Publications**  Utsey K,  **Gastonguay MS**, Russell S, Freling R,  Riggs MM, Elmokadem A, *Impact of Partition Coefficient Methods on PBPK Modeling,* Drug Metabolism and Disposition October 1, 2020  Zuppa AF, Brown GR, Zane NR, Curley MAQ, Bradfield J, Hakonarson H, **Gastonguay MS**, Moorthy G, Prodell J, Gastonguay MR, *Morphine Dose Optimization in Critically Ill Pediatric Patients with Acute Respiratory Failure: A Population Pharmacokinetic-Pharmacogenomic Study,* Critical Care Medicine, June 2019  Zuppa AF, Conrado DJ, Zane NR, Curley MAQ, Bradfield J, Hakonarson H, **Gastonguay MS**, Moorthy G, Prodell J, Gastonguay MR, *Midazolam Dose Optimization in Critically Ill Pediatric Patients with Acute Respiratory Failure: A Population Pharmacokinetic-Pharmacogenomic Study,* Critical Care Medicine, January 21st, 2019  **Presentations**  **Gastonguay MS**, Marazzi L, Vera-Licona P, *Identification of Combinations of Targets for Claudin-Low Triple Negative Breast Cancer Reversion,* Joint Meeting in Mathematics Undergradute Student Poster Session, Denver, CO, January 15th – 18th, 2020  **Gastonguay MS**, Russell S, Freling R, Utsey K, and Elmokadem A, *Prediction of maternal-fetal exposures of CYP450-metabolized drugs using physiologic pharmacokinetic modeling implemented in R and mrgsolve.,* R/Pharma Conference, Cambridge, MA, August 23rd, 2019  **Gastonguay MS**, Russell S, Freling R, Utsey K, and Elmokadem A, *Development of an Open-source Physiologically-Based Pharmacokinetic Model to Predict Maternal-Fetal Exposures of CYP450-Metabolized Drugs,* International Society of Pharmacometrics Regional Quantitative Systems Pharmacology Day Poster Session, Princeton, NJ, July 16th, 2019  **Gastonguay MS**, Russell S, Freling R, Utsey K, and Elmokadem A, *Development of an Open and General Physiologically Based Pharmacokinetic Model to Predict Maternal-Fetal Exposures for Drugs Metabolized by CYP Isoenzymes,* R/Medicine Conference, New Haven, CT, September 8th, 2018 |