JOSHUA TYLER SMITH

Lexington, KY
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EDUCATION

University of Florida May 2022
PhD in Mathematics
Thesis Advisor: Libin Rong, PhD
Thesis: Modeling the Impact of Broadly Neutralizing Antibody Therapy on Chronic HIV Infection

University of Florida May 2018
M.S. in Mathematics

University of Kentucky May 2013
Master of Public Health
Emphasis in Biostatistics
Graduate Certificate in Applied Statistics

University of Kentucky May 2011
B.S. in Biology & Psychology

EXPERIENCE

Sora Aerial Arts June 2024 - Present
Front Desk Assistant and Performer *Lexington, KY*

· Part-time front desk assistant, managing client schedules and processing payments, as work-study for course hours at a premium aerial arts/cirque studio.
· Primarily studying lyra/aerial hoop, and performed in the 2025 aerial production of The Jungle Book.

Javelin Biotech May 2022 - July 2023
Computational DMPK Scientist *Woburn, MA*

· Worked with a small team of two other computational scientists and several more tissue engineers to develop and optimize single and multi organ microphysiological systems for long term (up to 1 week) drug studies.
· Additionally worked alongside other modelers at a large pharmaceutical industry player that had funded our research and development of these microphysiological devices over a three year grant
· Primary products were our recirculating liver tissue chip (LTC) and three-part multi-tissue chip (MTC). During my tenure, the former was in final stages before commercial availability.
· Areas of expertise contributed to team were statistical and mathematical methods for assessing and validating the chip products for drug studies.
· My specific contributions included:

  – comparing different analytical models of compound depletion and binding with chip components across chip designs, including simulation studies assessing possible impacts of nonspecific chip component binding on physiological parameter estimation

- comparing chip-derived in-vitro estimates from PK studies to clinical (in-vivo) correlates (e.g. via well-stirred and parallel tube models) as a means to validate chip products as potential preclinical assays, testing on an assortment of approx 20 well-studied small molecule drugs such as alprazolam and tolbutamide, chosen to span multiple classes based on acid/base properties and primary clearance routes
- PBPK modeling using chip-derived IVIVE values of liver metabolism and kidney permeability along with physiochemical properties via the Rodgers and Rowland model (for tissue distribution estimates) to simulate estimated clinical concentration values for a subset of the previously mentioned drugs, and comparing these to literature concentration profiles

University of Florida August 2016 - May 2022
Graduate Assistant *Gainesville, FL*

· Primary instructor and lecturer for Mathematics for Liberal Arts Majors, College Algebra, Trigonometry, and Elementary Differential Equations.
· Discussion leader for Calculus I and Calculus III.
· Worked in biomathematics research with various colleagues of advisor Dr. Libin Rong on NIH funded research into ODE and DDE models of HIV infection, including:
  - PK + viral dynamics modeling of published clinical data on broadly neutralizing antibody infusion, including with nonlinear mixed effects modeling strategies
  - modeling of cell-to-cell transmission of HIV
  - modeling of multiply-inserted provirus in host cells
· During this time, also served one year as Treasurer of the Graduate Mathematics Association, a graduate student group responsible for social events and guest lectures, and as a coordinator for the biomathematics group seminar series.

University of Kentucky May 2013 - May 2016
Research Analyst *Lexington, KY*

· Data analyst and bench research assistant for two collaborating labs in the departments of neurobiology and physiology (Drs. Marilyn Duncan and Karyn Esser, respectively), with projects investigating various aspects of circadian rhythms, including metabolic intermittent fasting/time restricted feeding studies, APP/PS1 Alzheimer's model mice studying sundowning, and robustness of circadian gene expression in skeletal muscle tissue.
· Responsible primarily for devising experimental designs and analysis plans particularly as they pertained to actigraphy.
· Primary data analyst for many of these projects, bringing in relevant methods particularly in functional data analysis and circular statistics.
· With one of these two labs (neurobiology), was also primarily responsible for with animal care (mice and hamsters), lab management, tissue preparation and in-situ hybridization protocols for labeling clock-associated mRNA, and inventory and purchasing duties.

University of Kentucky September 2011 - May 2013
Graduate Research Assistant *Lexington, KY*

· Statistics consultant and data analyst for the Applied Statistics Lab, assisting in projects ranging from educational interventions to a post-occupancy evaluation of a newly constructed emergency department.
· Projects required structured meetings with clients in a manner designed to resemble industry consultation/CRO practices, at both pre-data collection and the data analysis stages of experiments.
· Analyses were performed with guidance of statistics and biostatistics faculty, and using the preferred software of the client, leading to experience with a wide array of statistical software packages and data and survey generation tools such as RedCap.

SOFTWARE EXPERIENCE

Statistical and Mathematical Software (and experience source)

Matlab (PhD & Javelin), R (MPH & PhD), R Shiny (Personal Projects), Monolix (PhD & ACoP Workshop), NON-MEM with Finch Studio (ACoP Workshop), Berkeley Madonna (PhD), SAS (MPH), STATA (MPH), JMP (MPH), SPSS (MPH)

PUBLICATIONS

Rajan SAP, Sherfey J, Ohri S, Nichols L, Parekh P, Kadar E, Clark F, George B, Gregory L, Tess D, Gosset J, Liras J, Geishecker E, Obach S, Cirit M. A Novel COC-based Milli-fluidic Liver Tissue Chip with Continuous Recirculation for Predictive Pharmacokinetics Applications. *AAPS J*, 25(6):102. October 2023.

Guo T, Smith JT, Widayani H, Qiu Z, Rong L. HIV Within-Host Viral Dynamics Incorporating Cell-to-Cell Transmission *Manuscript in review*

Duncan MJ, Smith JT, Franklin KM. Time of day but not aging regulates 5HT7 receptor binding sites in the hamster hippocampus. *Neuroscience Letters*, 622:306-311. January 2018.

Duncan MJ, Smith JT, Narbaiza J, Muezz F, Bustle LB, Qureshi S, Fiesler C, Legan SJ. Restricting feeding to the active phase in middle-aged mice attenuates adverse metabolic effects of a high fat diet. *Physiology & Behavior*, 167:1-9. December 2016.

Duncan MJ, Prochot JT, Cook DH, Smith JT, Franklin KM. Influence of aging on Bmal1 and Per2 expression in extra-SCN oscillators in the hamster brain. *Brain Research*, 1491:44-53. January 2013.

Duncan MJ, Smith JT, Franklin KM, Beckett TL, Murphy MP, St. Clair D, Donahue KD, Striz M, O'Hara BF. Effects of aging and genotype on circadian rhythyms, sleep, and clock gene expression in APPxPS1 knock-in mice, a model for Alzheimer's disease. *Experimental Neurology.* 236(2):249-258. August 2012.

POSTERS AND ABSTRACTS

Sherfey J, Rajan S, Ohri S, Smith JT, Nichols L, Parekh P, O'Handley K, Geishecker E, Cirit M. Novel multi-tissue chips for predictive pharmacokinetic studies. Gordon Research Conference on Drug Metabolism. Holderness, NH. July 2023.

Rajan S, Sherfey J, Ohri S, Smith JT, Nichols L, Parekh P, Morales R, Geishecker E, Cirit M. Novel COC-based Liver Tissue Chip for predictive pharmacokinetic applications. Gordon Research Conference on Drug Metabolism. Holderness, NH. July 2023.

Duncan MJ, Narbaiza J, Muezz F, Bustle LB, Smith JT, Qureshi S, Fiesler C, Legan SJ. Time-restricted feeding of a high-fat diet attenuates its deleterious effects in middle-aged mice. Rhythms In the Southeast Region Conference. Lexington, KY. May 2015.

Duncan MJ, Franklin KM, Smith JT. Aging differentially effects clock gene expression rhythms in the hamster adrenal gland. Meeting of the Society for Research on Biological Rhythms. Big Sky, MT. June 2014.

Effgen S, McCoy SW, Jeffries L, Chiarello L, Bush H, Smith J. Reliability of the School-Physical Therapy Interventions for Pediatrics Data System. APTA Combined Sections Meeting. Las Vegas, NV. February 2014.

Cook DH, Franklin KM, Smith JT, Prochot JR, Duncan MJ. Effect of aging on the *Bmal1* gene expression in the hamster brain. Spring Neuroscience Day. Lexington, KY. April 2013.

Reeves B, Brown J, Ickes M, Smith JT. Stress and coping behaviors among undergraduate and graduate students. 8th Annual CCTS Conference. Lexington, KY. April 2013.

Rose SA, Zephyr D, Smith JT, Masero C, Real K, Webber KH. Motivation, self-efficacy, and perceieve autonomy support in patients enrolled in a clinic-based behavioral weight loss program. Society of General Internal Medicine 36th Annual Meeting. Denver, CO. April 2013.

Duncan MJ, Smith JT, Franklin KM. Investigation of the effects of time of day and aging on 5-HT7 receptor binding in the hippocampus. Annual meeting of the Serotonin Club. Montpellier, France. July 2012.

Duncan MJ, Cook DH, Prochot J, Smith JT, Franklin KM. Aging attenuates *Bmal1* expression in the hamster hippocampus, cortex, and SCN but not skeletal muscle. 13th Meeting of the Society for Research on Biological Rhythyms. Destin, FL. May 2012.

Wallis N, Garnett C, Bailey B, Smith JT, Bennett K. Addressing a neglected healthcare disparity - assessing and improving lesbian, gay, bisexual, and transgender-related medical curricula. Southern Group on Educational Affairs. Lexington, KY. April 2012.

Smith JT, Franklin KM, Ighodaro ET, St. Clair D, Duncan MJ. Circadian rhythyms and clock gene expression in an APPxPS1 knock-in mouse model for Alzheimer's disease. Markesbery Symposium on Aging and Dementia. Lexington, KY. October 2011.

Black C, Jiang Y, Kiser S, Kleumper C, Collins H, Smith JT, Kelly TH. Neurobiological correlates of affective processing are modulated by impulsive and reward seeking personality. 2010 Spring Neuroscience Day. Lexington, KY. April 2010.

WORKSHOPS AND PRESENTATIONS

Introduction to Circular Statistics Journal club presentation generated for the circadian research group at the University of Kentucky covering basic circular statistics, including a brief overview of the crossover problem, calculation of circular means, and cosinor regression. Lexington KY. July 2013.

Experimental Design for RPLP Students One day course and consulting workshop for Rural Physician Leadership Program students affiliated with the University of Kentucky College of Medicine entering research projects as part of their requirements. Morehead KY. February 2013.

Introductory Seminar for SPSS. Two day course developed for introductory users to SPSS in the Kentucky cabinet of health and family services, covering topics from data management to regression. Developed course materials as well as lectured on regression models in SPSS. Frankfort KY. May 2012.