

Cole Brokamp

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EDUCATION

Ph.D. Anticipated, Biostatistics December 2015
Division of Biostatistics and Bioinformatics
Department of Environmental Health, College of Medicine
University of Cincinnati, Cincinnati, OH
GPA 3.8
Advisor: Dr. M.B. Rao

Bachelor of Science, Biomedical Engineering June 2010
Minor, Mathematics
University of Cincinnati, Cincinnati, OH
GPA 3.54

RESEARCH EXPERIENCE

Department of Biostatistics and Epidemiology, University of Cincinnati August 2012 – present
Cincinnati Childhood Allergy and Air Pollution Study (CCAAPS)

- Advisor: Dr. Patrick Ryan
- Unsupervised clustering of asthmatic subjects into clinically-useful disease subtypes and phenotype prediction using machine learning techniques
- Analyzing and visualizing big air pollution data from real-time, GPS equipped sensors using GIS tools
- General statistical consulting for epidemiologists and clinicians involved with study

Relationship of Indoor Outdoor and Personal Air (RIOPA)

- Advisor: Dr. Patrick Ryan, Dr. M.B. Rao
- Characterized and analyzed multivariate data using clustering and principal component techniques
- Implemented machine learning algorithm for prediction of personal exposure to individual elements in PM_{2.5} based on indoor and outdoor air data, as well as information about potential PM_{2.5} sources and personal activities

Brief Rating of Aggression by Children and Adolescents (BRACHA)

- Advisor: Dr. Drew Barzman, Dr. Jeff Welge
- Created novel data tool combining machine learning and logistic regression to predict presence, severity, frequency, and timing of aggressive acts committed in Cincinnati Children's College Hill Psychiatric Residential Clinic

Department of Pharmacology and Biophysics, University of Cincinnati July 2010 – January 2012
Ultrasound- and Liposome-Mediated Targeted Gene Therapy

- Advisor: Dr. Keith Jones, Dr. Christy Holland
- Developed novel methodology for delivering genetic material to myocardium in mouse model of acute myocardial infarction
- Ultrasound-mediated delivery of oligonucleotides targeted to suppress inflammation-related gene expression with spatial and temporal control over dosing.

Department of Biomedical Engineering, University of Cincinnati March 2007 – July 2010
Ion Channel Engineering and Characterization

- Advisor: Dr. Carlo Montemagno, Dr. David Wendell

- Implemented a planar artificial lipid bilayer system to study voltage-responsive ion currents through several ion channels
- Characterized Connexin-43 and several mutants' responses to voltage differences as well as several compounds
- Designed and purified several membrane proteins: genetic design and construction, protein production and purification, reconstitution into liposomes and polysomes

SOFTWARE SKILLS

R, Python, L^AT_EX, Knitr, WinBugs, QGIS, SAS, Max

PUBLICATIONS

- **Brokamp C**, Rao MB, Fan Z, Ryan PH. Does the elemental composition of indoor and outdoor PM2.5 accurately represent the elemental composition of personal PM2.5? *Atmospheric Environment*. 2015; 101: 226-234.
- Ryan PH, Son SY, Wolfe C, Lockey J, **Brokamp C**, LeMasters G. A field application of a personal sensor for ultrafine particle exposure in children. *Sci Total Environ*. 2015; 508: 366-73.
- **Brokamp C**, Todd J, Montemagno C, Wendell D. Electrophysiology of single and aggregate Cx43 hemichannels. *PLoS ONE*. 2012; 7(10): e47775.
- Koch SE, Gao X, Haar L, Jiang M, Cai W, Robbins N, **Brokamp C**, Tranter M, Liu Y, Ren X, Wang H, Jones WK, Rubinstein J. Probenecid: novel use as a non-injurious positive inotrope acting via cardiac TRPV2 stimulation. *J Mol Cell Cardiol*. 2012; 53(1): 134-44.
- Tranter M, Helsley RN, Paulding WR, McGuinness M, **Brokamp C**, Haar L, Liu Y, Ren X, Jones WK. Coordinated post-transcriptional regulation of Hsp70.3 gene expression by microRNA and alternative polyadenylation. *J Biol Chem*. 2011; 286(34): 29828-37.

POSTER PRESENTATIONS

- Tan JS, **Brokamp C**, LeMasters G, Bernstein DI, Lockey JE, Hershey GK, Villareal M, Ryan P. Longitudinal Patterns of Skin Prick Test Sensitization in Early Childhood Predicts Risk for Asthma at age 7. A poster presented at the American Academy of Allergy, Asthma & Immunology Annual Meeting, February 2015, Houston, TX.
- Schmidlin KA, **Brokamp C**, LeMasters G, Bernstein DI, Lockey JE, Hershey GK, Ryan P. Distinct Phenotypes of Childhood Asthma: Cluster Analysis in a Longitudinal Birth Cohort. A poster presented at the American Academy of Allergy, Asthma & Immunology Annual Meeting, February 2015, Houston, TX.
- **Brokamp C**, Appel K, Welge J, Mossman D, Barzman D. Brief Rating of Aggression by Children and Adolescents (BRACHA) 1.0. A poster presented at the American Academy of Psychiatry and the Law conference, October 2014, Chicago, IL.
- Chatterjee K, Ryan P, Grinshpun S, Schaffer C, **Brokamp C**, Adamkiewicz G, Chew G, Chillrud S, Ross J, Reponen T. Exposure to PM2.5, Ultrafine and Black Carbon Particles in Green vs. Non-Green Homes. A poster presented at the International Society of Exposure Science Conference, October 2014, Cincinnati, OH.
- **Brokamp C**, Rao MB, Ryan P. Assessing the Improvement in Predicting Personal Exposure to Elements in PM2.5 by Including Indoor PM2.5 Measurements and Home Characteristics to Outdoor PM2.5 Measurements. A poster presented at the International Society of Exposure Science Conference, October 2014, Cincinnati, OH.
- **Brokamp C**, Rao MB, Ryan P. Assessing Personal PM2.5 Exposure Prediction Improvement After Addition of Indoor PM2.5 Exposure and Personal Characteristics to Outdoor PM2.5 Exposure Measurements. A poster and speed oral presentation at the Joint Statistical Meeting, August 2014, Boston, MA.

- **Brokamp C**, Rao MB, Ryan P. Assessing the Improvement in Predicting Personal Exposure to Elements in PM2.5 by Including Indoor PM2.5 Measurements and Home Characteristics to Outdoor PM2.5 Measurements. A poster presented at the Health Effects Institute Conference, May 2014, Alexandria, VA.
- **Brokamp C**, Wendell D, Montemagno C. Electrophysiology and Plaque Formation of Cx43 Hemichannels. A poster presented at the Biophysical Society Conference, March 2010, San Francisco, CA.
- **Brokamp C**, Wendell D, Montemagno C. Exogenous Control of Gene Expression in Insect Cells via Ribozyme Modulation. A poster presented at the Biophysical Society Conference, March 2009, Boston, MA.
- **Brokamp C**, Wendell D, Montemagno C. The Engineering and Conductance of a Membrane Bound Nanopore from the Phi29 Portal Protein GP10. A poster presented at the Biophysical Society Conference, March 2009, Boston, MA.
- **Brokamp C**, Wendell D, Montemagno C. Exogenous Control of Gene Expression in Insect Cells via Ribozyme Modulation. A poster presented at the University of Cincinnati Undergraduate Poster Symposium, June 2008, Cincinnati, OH.
- **Brokamp C**, Wendell D, Montemagno C. Engineering the Calvin Cycle: A Cell Free Photoconversion System for Biofuel Generation. A poster presented at the University of Cincinnati Undergraduate Poster Symposium, June 2008, Cincinnati, OH.

SEMINAR PRESENTATIONS

- **Brokamp C**. Does the Elemental Composition of Indoor and Outdoor PM2.5 Accurately Represent the Elemental Composition of Personal PM2.5? A seminar presentation for the University of Cincinnati Biostatistics and Epidemiology, September 2014, Cincinnati, OH.
- **Brokamp C**. Exact Sampling and Counting for Fixed-Margin Matrices. A seminar presentation for University of Cincinnati Biostatistics and Epidemiology, September 2013, Cincinnati, OH.
- **Brokamp C**. Calculating Correct Standard Errors from Subsets of Complex Sampling Designs in R. A seminar presentation for University of Cincinnati Biostatistics and Epidemiology, August 2013, Cincinnati, OH.
- **Brokamp C**. Statistical Analysis of Microarray Data: Controlling the False Discovery Rate. A seminar presentation for BE 7089, University of Cincinnati Biostatistics and Epidemiology, October 2012, Cincinnati, OH.
- **Brokamp C**. Small Molecule Disruption of G Beta Gamma Signaling Inhibits the Progression of Heart Failure. A seminar presentation for the University of Cincinnati Department of Pharmacology and Biophysics, November 2011, Cincinnati, OH.
- **Brokamp C**. Ultrasound-Targeted Microbubble Destruction to Deliver Nucleic Acid to the Heart. A seminar presentation for the University of Cincinnati Department of Pharmacology and Biophysics, March 2011, Cincinnati, OH.
- **Brokamp C**. An academic research cooperative education experience. A seminar presentation for BME 321, University of Cincinnati Biomedical Engineering, February 2011, Cincinnati, OH.
- **Brokamp C**. Chronopharmacology: The Role of the Circadian Clock in Pharmacology. A seminar presentation for the University of Cincinnati Department of Pharmacology and Biophysics, January 2011, Cincinnati, OH.

AWARDS AND MEMBERSHIPS

- Member - International Society of Exposure Science (2014 – present)
- Member - American Statistical Association (2013 – present)
- Choose Ohio First Scholarship Recipient (2010 – 2015)
- University Graduate Scholarship Recipient (2010 – present)
- Distinguished Honors Scholar, UC Engineering (2010)
- University of Cincinnati Alumni Scholarship (2008 – 2009)
- University Cincinnati Scholar Recipient (2005 – 2010)

LEADERSHIP AND SERVICE

Co-founded Biostatistics Student Journal Club, Dept of Biostatistics and Epidemiology, UC (2013)
Student Representative to Graduate Education Committee, Dept of Pharmacology, UC (2010 - 2011)