Curriculum Vitae: Cole Brokamp, Ph.D.

Personal Data

- Name: Richard "Cole" Brokamp, Ph.D.
- Position: Associate Professor, University of Cincinnati College of Medicine
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Research Interests

- Place-based data science
- Environmental epidemiology
- Population health
- Causal inference machine learning methods
- Fairness in precision medicine

Education

Cincinnati Children's Hospital Medical Center, Cincinnati, Ohio USA
Postdoctoral Research Fellow, Division of Biostatistics & Epidemiology, 2016 - 2017
Advisor: Dr. Patrick Ryan

University of Cincinnati College of Medicine, Cincinnati, Ohio USA Ph.D., Department of Environmental Health, Division of Biostatistics and Bioinformatics, 2016 Advisor: Dr. M.B. Rao

University of Cincinnati, Cincinnati, Ohio USA B.S., Biomedical Engineering, 2010

Academic Appointments

- November 2017 - October 2020: Non-Tenure Track Research Assistant Professor, University of Cincinnati College of Medicine Department of Pediatrics
- November 2020 – June 2022: Tenure Track Assistant Professor, University of Cincinnati College of Medicine Department of Pediatrics
- July 2022 – present: Tenure Track Associate Professor, University of Cincinnati College of Medicine Department of Pediatrics

Grants and Contracts

Current

Selected Previous (Brokamp, PI)

Publications

Patrick H Ryan, Christopher Wolfe, Allison Parsons, Cole Brokamp, Ashley Turner, Erin Haynes. Participant Engagement to Develop Report-Back Materials for Personal Air Sampling. *Journal of Clinical and Translational Science*. In Press. 2023.

Emrah Gecili, Cole Brokamp, Erika Rasnick, Pedro M Afonso, Eleni-Rosalina Andrinopoulou, Judith W Dexheimer, John P Clancy, Ruth H Keogh, Yizhao Ni, Anushka Palipana, Teresa Pestian, Andrew Vancil, Grace Chen Zhou, Weiji Su, Christopher Siracusa, Patrick Ryan, Rhonda D Szczesniak. Built environment factors predictive of early rapid lung function decline in cystic fibrosis. *Pediatric Pulmonology*. In Press. 2023.

Erika Rasnick, Patrick Ryan, Jeff Blossom, Heike Luttmann-Gibson, Nathan Lothrop, Rima Habre, Diane R Gold, Andrew Vancil, Joel Schwartz, James E Gern, Cole Brokamp. High Resolution and Spatiotemporal Place-Based Computable Exposures at Scale. *AMIA Summits on Translational Science Proceedings*. In Press. 2023.

Clara Zundel, Patrick Ryan, Cole Brokamp, Autumn Heeter, Yaoxian Huang, Jeffrey Strawn, Hilary Marusak. Air Pollution, Depressive and Anxiety Disorders, and Brain Effects: A Systematic Review. *NeuroToxicology*. In Press. 2022.

Andrew Vancil, Jeffrey R Strawn, Erika Rasnick, Amir Levine, Heidi K Schroeder, Ashley M Specht, Ashley L Turner, Patrick H Ryan, Cole Brokamp. Pediatric Anxiety and Daily Fine Particulate Matter: A Longitudinal Study . *Psychiatry Research Communications*. In Press. 2022.

Patents

Assem Ziady, Rhonda Szczesniak, John Clancy, Cole Brokamp, inventors; Cincinnati Children's Hospital Medical Center, assignee. Compositions and methods for treatment of lung function. United States patent US 10,761,099. 2020 Sep 1.

Talks

Geomarker Curation and Computation. *University of Cincinnati Biomedical Informatics Practicum (BMIN8001) guest lecture*. Cincinnati, OH. 2023

Air Pollution and Pediatric Mental Health. *Citizens Climate Lobby, Cincinnati Chapter Meeting*. Cincinnati, OH. 2023

Functional Programming in R with {purrr}. *CCHMC R Users Group Meeting*. Cincinnati, OH. 2023

A Framework for Automated and Reproducible Geomarker Curation and Computation at Scale. *Yale Biostatistics Seminar*. Online. 2022

Introduction to Geoinformatics. *University of Cincinnati Introduction to Medical Informatics course guest lecture*. Cincinnati, OH. 2022

Automating Your Academic CV, Biosketch, and Website with R. *CCHMC R Users Group Meeting*. Cincinnati, OH. 2022

Decentralized Geomarker Assessment for Multi-Site Studies. *Pediatric Academic Societies Annual Meeting.* Denver, CO. 2022

Decentralized Geomarker Assessment for Multi-Site Studies. *Rare Diseases Clinical Research Network (RDCRN) Steering Committee Meeting.* Online. 2022

Decentralized Geomarker Assessment for Multi-Site Studies. *NIH Bench to Bassinet PCGC EMR Extraction Working Group Meeting.* Online. 2022

Challenges and Solutions for Private and Reproducible Environmental Exposure Assessment at Scale. *NIH Ethical, Legal, and Social Implications of Gene-Environment Interaction Research Workshop.* Online. 2022

Geoinformatics for Population Health. *University of Cincinnati Introduction to Medical Informatics course guest lecture.* Cincinnati, OH. 2021

Efficient and Secure High Resolution Spatiotemporal Exposure Assessment. *International Society of Exposure Science Annual Meeting.* Online. 2021

Decentralized, Efficient, and Secure High Resolution Spatiotemporal Exposure Assessment at Scale. *NIH Integrating Multiscale Geospatial Environmental Data into Large Population Health Studies Workshop.* Online. 2021

Decentralized and Reproducible Geocoding and Geomarker Assessment for Multi-Site Studies. *Pediatric Acute Care Cardiology Collaborative Spring Conference.* Online. 2021

Geomarkers and Health. *Rutgers University Social Epidemiology guest lecture.* Online. 2021

Decentralized and Reproducible Geocoding and Characterization of Community and Environmental Exposures at Scale. *University of Cincinnati Biomedical Informatics Practicum (BMIN8001) guest lecture.* Cincinnati, OH. 2021

Three Levels of Computational Mobility in R. *SatRday Columbus.* Virtual. 2020

Decentralized and Reproducible Geocoding and Characterization of Community and Environmental Exposures at Scale. *Pediatric Musculoskeletal & Rheumatology Innovation Core Center Seminar Series.* Virtual. 2020

Introduction to Geoinformatics for Precision Population Health. *University of Cincinnati Introduction to Medical Informatics course guest lecture.* Cincinnati, OH. 2020

Short-term Ambient Fine Particulate Matter and Anxiety Symptoms in Adolescents with Generalized Anxiety Disorder. *International Society of Environmental Epidemiology Annual Meeting.* Virtual. 2020

Decentralized Geomarker Assessment for Multi-Site Studies (DeGAUSS). *UseR! 2020 Conference (Conference Canceled).* St. Louis, MO. 2020

Decentralized and Reproducible Geocoding and Characterization of Community and Environmental Exposures at Scale. *University of Cincinnati Biomedical Informatics Practicum (BMIN8001) guest lecture.* Cincinnati, OH. 2020

Pediatric Psychiatric Emergency Department Utilization and Fine Particulate Matter: A Case-Crossover Study. *University of Cincinnati Department of Epidemiology Seminar.* Cincinnati, OH. 2020

Using Twitter for Academic Networking. *Cincinnati Children's Faculty Career Development Seminar Series.* Cincinnati, OH. 2019

Causal Inference Machine Learning Methods for Identifying Subpopulations Susceptible to the Health Effects of Air Pollution. *Cincinnati Children's Machine Learning Focus Group.* Cincinnati, OH. 2019

Non-Parametric and Data-Driven Methods for Identifying Subpopulations Susceptible to the Health Effects of Air Pollution. *International Biometric Society (Eastern North American Region) Spring Meeting.* Philadelphia, PA. 2019

Decentralized and Reproducible Geocoding and Characterization of Community and Environmental Exposures at Scale. *Center for Clinical & Translational Science & Training Grand Rounds.* Cincinnati, OH. 2019

Decentralized and Reproducible Geocoding and Characterization of Community and Environmental Exposures at Scale. *Northwestern Institute for Public Health and Medicine Seminar Series.* Chicago, IL. 2018

Introduction to Geoinformatics for Precision Population Health. *University of Cincinnati Introduction to Medical Informatics course guest lecture.* Cincinnati, OH. 2018

Reproducible Research in R: Geoinformatics, Epidemiology, and Publicly Available Health and GIS Data. *Workshop at the American College of Epidemiology Annual Meeting.* Cincinnati, OH. 2018

Climate Change and Health Disparities in the Urban Environment. *University of Cincinnati Research and Innovation Week.* Cincinnati, OH. 2018

Geoinformatics for Environmental Epidemiology. *Biomedical Informatics (BMIN8001) Practicum Guest Lecture.* Cincinnati, OH. 2018

Hot Topics in Pediatric Research Methodology: CART and Random Forest. *Pediatric Academic Society Annual Meeting.* Toronto, ON. 2018

Ensemble Machine Learning for Air Pollution Exposure Assessment. *American Statistical Association, Cincinnati Chapter Meeting.* Cincinnati, OH. 2018

Combined Sewer Overflow Events and Childhood Emergency Department Visits: A Case-Crossover Study. *University of Cincinnati Environmental Health Seminar.* Cincinnati, OH. 2017

The Cincinnati Childhood Allergy and Air Pollution Study: An Overview and New Approaches to Exposure Assessment. *Harvard School of Public Health Air, Climate & Energy Center Research Meeting.* Boston, MA. 2017

Decentralized and Reproducible Geocoding and Characterization of Community and Environmental Exposures for Multi-Site Studies. *Harvard School of Public Health Air, Climate & Energy Center Research Meeting.* Boston, MA. 2017

Decentralized and Reproducible Geocoding and Characterization of Community and Environmental Exposures for Multi-Site Studies. *International Society of Exposure Science Annual Meeting.* Research Triangle Park, NC. 2017

Assessing Daily Exposure to PM2.5 with Machine Learning and Remote Sensing. *International Society of Exposure Science Annual Meeting.* Research Triangle Park, NC. 2017

Assessing Daily Exposure to PM2.5 with Machine Learning and Remote Sensing. *Cincinnati Children's Hospital Medical Center Division of Biostatistics and Epidemiology Seminar.* Cincinnati, OH. 2017

Using GRAPPH to Leverage Geoinformatics for Innovative Research, Place-based Clinical Care, and Community-Centered Quality Improvement. *Cincinnati Children's Hospital Medical Center Mayerson Center for Safe and Healthy Children Quarterly Research Meeting.* Cincinnati, OH. 2017

Combined Sewer Overflow Events and Childhood Emergency Department Visits: A Case-Crossover Study. *Cincinnati Children's Hospital Medical Center Postdoc and Research Associate Meeting.* Cincinnati, OH. 2017

Geocoding to Characterize Community and Environmental Exposures for Multi-site Studies. *Cincinnati Children's Hospital Medical Center Division of Biomedical Informatics Hutton Lecture Series.* Cincinnati, OH. 2017

GIS Tools for Environmental Epidemiology. *University of Cincinnati Biomedical Informatics (BMIN8001) Practicum course guest lecture.* Cincinnati, OH. 2017

Building A Platform for Data Sharing. *Cincinnati Children's Hospital Medical Center Academy Health Site Visit.* Cincinnati, OH. 2017

Land Use Models for Elemental Components of Particulate Matter in an Urban Environment: A Comparison of Regression and Random Forest Models. *International Society of Exposure Science Annual Meeting.* Utrecht, NL. 2016

Predictive Comparisons: Interpreting Input Effects for Any Supervised Learner. *Cincinnati Children's Hospital Medical Center Division of Biostatistics & Epidemiology Journal Club.* Cincinnati, OH. 2016

Land Use Models for Elemental Components of Particulate Matter in an Urban Environment: A Comparison of Regression and Random Forest Models. *University of Cincinnati Division of Biostatistics and Bioinformatics Seminar Series.* Cincinnati, OH. 2016

Data Visualization for Population Health Initiatives. *All In Data Visualization Webinar.* Cincinnati, OH. 2016

Using Machine Learning and Interactive Dashboards to Understand How Children's Health is Impacted by their Community and Surrounding Environment. *University of Cincinnati Institute for Analytics Innovation Showcase and Networking Event.* Cincinnati, OH. 2016

Combined Sewer Overflow and Childhood Hospital Admissions. *Cincinnati Children's Hospital Medical Center Division of Biostatistics & Epidemiology Seminar Series.* Cincinnati, OH. 2016

Land Use Random Forests for Estimation of Exposure to Elemental Components of Particulate Matter. *University of Cincinnati Division of Biostatistics and Bioinformatics Doctoral Dissertation Defense.* Cincinnati, OH. 2016

Geospatial Data for Environmental Epidemiology. *Cincinnati Children's Hospital Medical Center Environmental Epidemiology Shared Interest Group Seminar Series.* Cincinnati, OH. 2016

Confidence Intervals for Random Forest Predictions Using the Infinitesimal Jackknife. *University of Cincinnati Division of Biostatistics and Bioinformatics Seminar Series.* Cincinnati, OH. 2015

Childhood Residential Changes are Associated with Decreased Traffic Exposure and Improved Neighborhood Characteristics. *International Society of Exposure Science Annual Meeting.* Las Vegas, NV. 2015

R Studio and R Markdown: An integrated IDE and report generator for R. *University of Cincinnati BE7022 (Intro To Biostatistics) Guest Lecture.* Cincinnati, OH. 2015

Does the Elemental Composition of Indoor and Outdoor PM2.5 Accurately Represent the Elemental Composition of Personal PM2.5?. *University of Cincinnati Division of Epidemiology Seminar Series.* Cincinnati, OH. 2014

Assessing Personal PM2.5 Exposure Prediction Improvement After Addition of Indoor PM2.5 Exposure and Personal Characteristics to Outdoor PM2.5 Exposure Measurements. *Joint Statistical Meeting.* Boston, MA. 2014

Exact Sampling and Counting for Fixed-Margin Matrices. *University of Cincinnati Division of Epidemiology Seminar Series.* Cincinnati, OH. 2013

Small Molecule Disruption of G Beta Gamma Signaling Inhibits the Progression of Heart Failure. *University of Cincinnati Department of Pharmacology and Biophysics Seminar Series.* Cincinnati, OH. 2011

Ultrasound-Targeted Microbubble Destruction to Deliver Nucleic Acid to the Heart. *University of Cincinnati Department of Pharmacology and Biophysics Seminar Series.* Cincinnati, OH. 2011

An academic research cooperative education experience. *University of Cincinnati BME321 Guest Lecture.* Cincinnati, OH. 2011

Awards and Honors

- 2020: CCHMC Division of Biostatistics & Epidemiology Top Research Achievement
- 2020: CCHMC Division of Biostatistics & Epidemiology Top Publication
- 2017: CCHMC Division of Biostatistics & Epidemiology Top Research Achievement
- 2017: CCHMC Division of Biostatistics & Epidemiology Top Publication
- 2016: CCHMC Division of Biostatistics & Epidemiology Travel Award

- 2016: CCHMC Arnold W. Strauss Fellowship Award
- 2015: Choose Ohio First Scholarship Recipient

Service and Leadership

Service

Professional Societies

- 2014 - present: Member, International Society of Exposure Science
- 2018 - present: Member, International Society of Environmental Epidemiology
- itutional Committees
- 2023 - present: Member CCHMC Biomedical Informatics Faculty Search Committee
- 2022 - present: Member, CCHMC Artificial Intelligence Governance Council
- 2019 - present: Member, CCHMC DBE Faculty Career Development Committee
- 2022: Chair, CCHMC DBE Strategic Plan Steering Committee
- 2017 - present: Member, CCHMC DBE Strategic Plan Steering Committee
- 2017 - present: Member, CCHMC DBE Research Committee
- erence Leadership
- 2016: Chair of the Land Use Regression Modeling Session, International Society of Exposure Science Annual Meeting
- 2017: Chair of the Ensemble Learning for Air Pollution Exposure Assessment Session, International Society of Exposure Science Annual Meeting
- 2021: Chair of the Harnessing Big Data in Exposure Science Session, International Society of Exposure Science Annual Meeting
- 2021: Chair of the Environmental Exposures and Mental Health Session, International Society of Environmental Epidemiology

Scientific Reviewer

- Journal Reviewer (12 manuscripts reviewed per year, on average):
  - Academic Pediatrics
  - American Journal of Respiratory and Critical Care Medicine
  - Annals of Epidemiology
  - Environmental Health Perspectives
  - Environment International
  - Environmental Modeling & Assessment
  - Environmental Pollution
  - Environmental Research
  - Environmental Science & Technology
  - Environmental Science & Technology Letters
  - Health & Place
  - International Journal of Environmental Research and Public Health
  - International Journal of Epidemiology
  - Journal of Exposure Science and Environmental Epidemiology
  - Journal of Open Source Software
  - PLOS ONE
  - Pediatrics
  - Stochastic Environmental Research and Risk Assessment
  - Science of the Total Environment
- Grant Reviewer:

  - 2017: Puerto Rico Science, Technology & Research Trust
  - 2018 - 2021: Arnold S. Strauss Fellowship Award, CCHMC
  - 2018 – 2020, 2022: University of Rochester Processes and Methods Grant
  - October 2019: NIH SIEE Study Section, Early Career Reviewer
  - 2020: University of Michigan M-LEEaD Center Pilot Projects
  - 2020: Ohio State University CCTS Pilot Projects
  - 2021: University of Louisville CCTS Pilot Translational & Clinical Studies Program
  - March 2022: NIH NIEHS ZES1 LKB-S (KS) Special Emphasis Panel
  - March 2022: NIH NIEHS ZES1 LWF-S (K9) Special Emphasis Panel
  - November 2022: NIH NIEHS ZES1 WL-W (K) Special Emphasis Panel
  - February 2023: NIH NCI ZCTA1 TCRB-J (M2) R Review Panel
- Abstract Reviewer:
  - 2018, 2019, 2022: International Societies of Exposure Science
  - 2018, 2020, 2022: International Society of Environmental Epidemiology Meeting
  - 2021, 2022, 2023: American Medical Informatics Association Clinical Informatics Conference

Leadership

- 2017 - present: Founding Director of the Geospatial Research Accelerator for Precision Population Health (GRAPPH) within the Data Management and Analysis Center at Cincinnati Children's
- 2019 - present: Founding Leader of Cincinnati Children's R Users Group (CCHMC RUG)