

John Sterrett

Updated January 14, 2025

Email: John.Sterrett@colorado.edu **GitHub:** github.com/sterrettJD **Phone:** (731) 819-7433

Research topics Ecology of the gut microbiome, Gut-brain axis, stress physiology
Methods interests Bioinformatics, multivariate statistics, causal inference, machine learning

Education **University of Colorado at Boulder (CUB)** Boulder, CO
PhD in Integrative Physiology, August 2020 – Present
Interdisciplinary Quantitative Biology (IQ Bio) Certificate Program
Mentors: Catherine Lozupone and Christopher Lowry *GPA: 4.0.*
Rotations: Catherine Lozupone, Noah Fierer, Nichole Reisdorph, Luke Evans,
and Maggie Stanislawski
Committee: Marissa Ehringer (chair), Christopher Lowry, Catherine
Lozupone, Maggie Stanislawski, Matthew Olm

East Tennessee State University (ETSU) Johnson City, TN
BS in Nutrition August 2016 – May 2020
Mentor: Dr. William A Clark *GPA: 4.0*

Selected coursework (Graduate)

- EBIO 5460 Applications of Shotgun Metagenomics in Microbial Ecology
- EBIO 6100 Causal Inference in Ecological Data
- CSCI 6118 Software Engineering for Scientists
- IPHY 5800 Advanced Statistics and Research Methods in Integrative Physiology

Selected coursework (Undergraduate)

- CSCI 2700 Data Structures
- NTFD 3465 Human Nutrition and Metabolism
- NTFD 4447 Nutritional Biochemistry
- NTFD 4425 & 4435 Clinical Nutrition I & II

Honors, awards, scholarships, and fellowships Graduate Student Poster Award (Front Range Microbiome Symposium) 2024
SymbNET Host-Microbe Symbiosis Scholar 2023
Undergraduate Research Opportunities Program Team Grant (CUB) 2023
William J. Freytag Fellow (CUB) 2021
Integrated Data Science Fellow (National Science Foundation) 2021
Summa Cum Laude (ETSU) 2020
1911 Society Inaugural Member (ETSU) 2020
College of Clinical and Rehabilitative Health Sciences

Outstanding Undergraduate Student (ETSU)	2020
Undergraduate Summer Research Fellowship	2019
Nutrition Honors-in-Discipline (ETSU)	2018
Stanton Honors Scholar (ETSU)	2017
University Honors Scholar (ETSU)	2016

Publications

Appearance of green tea compounds in plasma following green tea consumption is modulated by the gut microbiome in mice

Sterrett JD, Quinn KD, Doenges KA, Nusbacher NM, Levens CL, Armstrong ML, Reisdorph RM, Smith H, Saba LM, Kuhn KA, Lozupone CA, Reisdorph NA. *Microbiology Spectrum*, 2024.

Protective effects of *Mycobacterium vaccae* ATCC 15483 against “Western”-style diet-induced weight gain and visceral adiposity in adolescent male mice

Desmond LW, Lamya’a MD, Kessler LR, Akonom T, Hunter EA, Holbrook EM, Andersen ND, **Sterrett JD**, Boateng DA, Stuart BJ, Guerrero L, Gebert MJ, Tsai P-S, Langgartner D, Reber SO, Frank MG, Lowry CA. *Brain, Behavior, and Immunity*, 2024.

Effects of repeated intragastric administrations with heat-inactivated *Mycobacterium aurum* DSM 33539 on the stress-induced aggravation of dextran sulfate sodium (DSS) colitis in C57BL/6N mice

Langgartner D, Weiss AJ, Amoroso M, **Sterrett JD**, Lowry CA, Reber SO *Frontiers in Neuroscience*.

Agrarian diet improves metabolic health in HIV-positive men with *Prevotella*-rich microbiomes: results from a randomized trial

O’Connor JB, Fouquier J, Neff CP, **Sterrett JD**, Marden T, Fiorillo S, Siebert JC, Scheinder J, Nusbacher N, Noe AT, Fennimore B, Higgins J, Campbell TB, Palmer B, Lozupone CA. *BioRxiv*, in review at *Nature Communications*.

Integrating biological knowledge for mechanistic inference in the host-associated microbiome

Santangelo BE, Apgar M, Burkhart Colorado AS, Martin CG, **Sterrett JD**, Wall E, Joachimiak MP, Hunter LE, Lozupone CA. *Frontiers in Microbiology*, 2024.

Poly-omic risk scores predict inflammatory bowel disease diagnosis

Sterrett JD*, Arehart CH*, Garriss RL, Quispe-Pilco RE, Gignoux CR, Evans LM, Stanislawski MA. *mSystems*, 2023.

Gut microbiome and lipidome signatures in irritable bowel syndrome patients from a low-income, food desert area - a pilot study

Sterrett JD*, Paripatia N*, Nesi L*, Dawud LM, Kessler LR, Lowry CA, Perez LJ, DeSipio J, Phadtare S.

Microorganisms, 2023.

An integrative model for endophenotypes relevant to posttraumatic stress disorder (PTSD): detailed methodology for inescapable tail shock stress (IS) and juvenile social exploration (JSE)

Andersen ND, **Sterrett JD**, Costanza-Chavez GW, Zambrano CA, Baratta MV, Frank MG, Maier SF, Lowry CA.

Translational Methods for PTSD Research. Pinna, G. (eds), 2023.

A pilot study exploring temporal development of the gut microbiome and metabolome in breastfed neonates during the first week of life

Awan I, Schultz E, **Sterrett JD**, Dawud LM, Kessler LR, Schoch D, Lowry CA, Feldman-Winter L, Phadtare S.

Pediatric Gastroenterology Hepatology and Nutrition, 2023.

SCNIC: Sparse correlation network investigation for compositional data

Shaffer M, Thurimella K, **Sterrett JD**, Lozupone CA.

Molecular Ecology Resources, 2023.

Impacts of breast cancer and chemotherapy on gut microbiome, cognitive functioning, and mood relative to healthy controls

Bilenduke E, **Sterrett JD**, Ranby KW, Borges VF, Grigsby J, Carr AL, Kilbourn K, Lowry CA.

Scientific Reports, 2022.

A metagenomic investigation of spatial and temporal changes in sewage microbiomes across a university campus

Fierer N, Holland-Moritz H, Alexiev A, Batther H, Dragone NB, Friar L, Gebert MJ, Gering S, Henley JB, Jech S, Kibby EM, Melie T, Patterson WB, Peterson E, Schutz K, Stallard-Olivera E, **Sterrett JD**, Walsh C, Mansfeldt C.

mSystems, 2022.

The Influence of the Microbiota on Brain Structure and Function: Implications for Stress-Related Neuropsychiatric Disorders

Sterrett JD, Andersen NA, Lowry CA

Evolution, Biodiversity and a Reassessment of the Hygiene Hypothesis, Rook GAW, Lowry CA (eds.), 2022.

Characterization of gut microbiome and metabolome in *Helicobacter pylori* patients in an underprivileged community in the United States

Sterrett JD*, White B*, Grigoryan Z, Lally L, Heinze JD, Alikhan H, Lowry CA, Perez LJ, DeSipio J, Phadtare S

World J Gastroenterol, 2021.

Microbiome Diversity and Differential Abundances Associated with Gastrointestinal Symptoms, BMI, Immune Markers, and Fecal Short Chain Volatile Fatty Acid Profiles

Sterrett JD, Clark WA, Chandley MJ

Undergraduate Honors Theses, 2020.

* Authors contributed equally

Research experience

Lozupone Lab

Mentor: Catherine Lozupone (CU Anschutz)

May 2022 – Present

- Developed a reproducible pipeline for analysis of host-microbiome dual transcriptome data from gut mucosal samples, while profiling the efficacy of novel wet-lab protocols.
- Reconstructed genomes from deep shotgun metagenomic sequencing data to compare *Prevotella* strains across the globe in health and disease, using a reproducible research workflow.
- Maintained open-source software developed by the lab including [SCNIC](#), [AMON](#), and [KEGG_Parser](#).
- Organized and moderated code review sessions to increase code quality and literacy within the lab.

Behavioral Neuroendocrinology Lab

Mentor: Christopher A Lowry (CUB)

July 2020 – Present

- Led 16S microbiome analysis for multiple projects within the lab and collaborations with other labs.
- Mentored lab members and collaborators on microbiome analysis techniques and statistics.
- Analyzed untargeted metabolomics and lipidomics data from multiple *Mycobacterium vaccae* strains and plasma of animals inoculated with the strains.

Rotating Research Assistant

Interdisciplinary Quantitative Biology Program (CUB) August 2021 – May 2022

- Evaluated module creation in sparse and compositional co-occurrence networks under varying conditions from real and simulated datasets. Benchmarked new software for microbiome-specific co-occurrence network module identification ([SCNIC](#)). Rotation with Catherine Lozupone.
- Developed a custom database of microbial nicotine-degrading genes and a workflow to mine shotgun metagenomic data for such genes. Applied workflow to study the prevalence of nicotine-degrading genes in the oral metagenomes of e-cigarette users, smokers, and non-users. Rotation with Noah Fierer.
- Integrated untargeted metabolomics, lipidomics, and microbiome data to assess how microbiome composition modulates green tea-derived compounds emerging in plasma after tea consumption in germ-free and humanized mice. Rotation with Nichole Reisdorph.
- In a team setting, developed a framework for linear modeling of multi-omic microbiome data to identify relative contributions of each -omic datatype to predicting phenotype. Team rotation with Luke Evans and Maggie Stanislawski, [bioRxiv](#).

Nutritional Biochemistry Lab

Mentor: William A Clark (ETSU)

August 2017 – May 2020

- Collaborated with research faculty at ETSU, Quillen College of Medicine, and Bill Gatton College of Pharmacy for research regarding the gut-brain axis, metabolic syndrome, vitamin levels, and supplement bioavailability.
- Instructed undergraduate experimental foods classes in performing proximate analysis on experimental foods.
- Designed and implemented a study to analyze the properties of the ETEE brand beeswax wrap.

Zahner Electrophysiology Lab

Mentor: Matthew Zahner (ETSU)

April 2018 – May 2018

- Assisted in rat autopsy and surgery in preparation for locating blood pressure regulatory centers of the brain and sympathetic denervation of the spleen in sepsis

Teaching and Mentorship

Undergraduate Research Mentor

Logan P. - Wild vs Laboratory Rat Microbiome

May 2023 – Present

Teaching assistant, Department of Integrative Physiology (CUB)

IPHY 4440: Endocrinology

Summer 2021

IPHY 2420: Introduction to Nutrition	Fall 2020 – Spring 2021
IPHY 4420: Nutrition for Human Performance	Fall 2020

Teaching assistant, Department of Chemistry (CUB)

CHEM 1133: General Chemistry II Spring 2021

Supplemental Instructor, Department of Health Sciences (ETSU)

HSCI 2010: Anatomy & Physiology II Spring 2020

Lead Tutor, TRIO-Student Support Services (ETSU)

Introductory, General, and Organic Chemistry Fall 2018 – Spring 2020

Biology, Microbiology, and Anatomy & Physiology Fall 2018 – Spring 2020

Paper Writing Fall 2019

Instructor, Unaka High School Band (Unaka, TN)

Low Brass Music and Marching Fundamentals Summer 2019

Private Tutor (Johnson City, TN)

Grades 3-12 Math and Science Spring 2019 – Summer 2020

Posters and talks

Integrating Causal Inference with Knowledge Graphs: Biomedical Applications

Boston Computational Club January 2025

Using HoMi for Host-Microbiome Dual Transcriptomics

Front Range Microbiome Symposium April 2024

(Graduate Student Poster Award)

Eavesdropping on Tiny Stomach Friends (Assessing the Gut-Brain Axis with Host-Microbiome Dual Transcriptomics)

November 2023

CU Boulder BioFrontiers Institute UpGoer 5 Lightning Talks (**1st place**)

Detangling the Host-Microbiome Dual Transcriptome Enables Profiling of Transcriptional Crosstalk at Mucosal Surfaces

SymbNET PhD Summer School on Host-Microbe Symbiosis July 2023

Strain-level Metagenomic Investigation of HIV-Associated *Prevotella*-Rich Gut Microbiomes

Front Range Microbiome Symposium April 2023

Studying Disruptions to the Microbiome and Gut-Brain Axis from Chemotherapy

March 2023

March 2023

CU Boulder Department of Integrative Physiology - Microbiome Gut-Brain Axis: Implications for Disease (invited course guest lecture)

Understanding Microbiome Analysis January 2023
CU Boulder Department of Integrative Physiology - Microbiome Gut-Brain Axis: Implications for Disease (invited course guest lecture)

Impacts of the Gut Microbiome on Green Tea Metabolism
CU Anschutz Microbiome Research in Progress Meeting November 2022

Our Tiny Stomach Friends Know When We're Sad (Microbial Phenotype Shifting During Host Stress) October 2022
CU Boulder BioFrontiers Institute UpGoer 5 Lightning Talks (**1st place**)

Techniques for Microbiome Analysis September 2022
CU Boulder Department of Integrative Physiology - Applications of Bioinformatics (invited course guest lecture)

Gut Microbiome and Short Chain Fatty Acid Profiles of Individuals with Human Immunodeficiency Virus in Rural Appalachia
Front Range Microbiome Symposium April 2022

Differences in Cognitive Functioning, Mood, and Gut Microbiome in Women Receiving Chemotherapy for Breast Cancer and Healthy Controls
American Psychosomatic Society Annual Meeting March 2022

How Does Chemotherapy Impact Gut Microbiome, Cognitive Functioning, and Mood? A Comparison of Women With and Without Breast Cancer May 2021
CU Anschutz Microbiome Research in Progress Meeting

Stress and the Gut Microbiota in Athletes October 2020
CU Boulder Nutrition for Human Performance Guest Lecture Series

Microbiome Diversity and Differential Abundances Associated with Gastrointestinal Symptoms, BMI, Immune Markers, and Fecal Short Chain Volatile Fatty Acid Profiles May 2020
American Society for Nutrition Conference (presented virtually)

Properties of the ETEE Compostable Plastic Wrap Substitute May 2020
American Society for Nutrition Conference (presented virtually)

The Fecal Fermentation Profile of Patients with HIV April 2020

Appalachian Student Research Forum (cancelled due to COVID-19)

Short and Long Chain Fatty Acid Levels as Indicators of Health in HIV-infected vs Non-infected Individuals

February 2020

Tennessee Posters at the Capitol

Properties of the ETEE Wrap Biodegradable Plastic Wrap Substitute

SoCon Undergraduate Research Forum

November 2019

Short-Chain Fatty Acid Profiles for Mouse Models of Autism Spectrum Disorder

April 2019

Appalachian Student Research Forum

Skills

Programming Languages

Python

Data wrangling, scripting, statistical modeling, machine learning, plotting, reproducible analysis using Snakemake, and software packaging.

R

Data wrangling, scripting, statistical modeling, plotting, and software packaging.

Julia

Data wrangling, statistics, and plotting.

C++

Implementation of low-level data structures and algorithms.

Computational Skills

Proficient with **Unix** command line, **bash** scripting, and **high performance compute** cluster use.

Proficient with Git/Github, Jupyter Notebooks, Google CoLaboratory, and Rmarkdown/Quarto for project management.

Bioinformatics Programs

Quantitative Insights into Microbial Ecology 2 (QIIME2), BioBakery tools (HUMAnN, MetaPhlAn, PhyloPhlAn), genome assembly (SPAdes), binning, dereplication, and quality control (CheckM, metaBAT, dRep, QUAST), sequence quality control (fastQC/MultiQC, Trimmomatic, SeqTK), read mapping (HISAT2, BBmap, Bowtie) and counting (featureCounts)

General Programs

Microsoft Office, Google Suite

Professional Memberships

American Society for Microbiology

Aug 2021 – Present