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Engineering & Scientific Consulting

Carlton Poindexter, Ph.D.

Senior Scientist | Ecological and Biological Sciences
Natick
+1-508-903-4692 | cpoindexter@exponent.com

Professional Profile

Dr. Carlton Poindexter is an interdisciplinary environmental scientist with a background in analytical chemistry and biotechnology. He specializes in contaminant fate and transport in biosolid and biological waste within agricultural and wastewater treatment systems. He has expertise in manure management systems used for livestock, as well as specialty areas in environmental antimicrobial resistance (AMR). Dr. Poindexter also has experience in environmental justice.

Prior to joining Exponent, Dr. Poindexter earned his Ph.D. from the University of Maryland in Environmental Science and Technology. Dr. Poindexter's doctoral work focused on AMR associated with manure and wastewater biosolids following administration of clinically relevant antibiotics to dairy cows and humans. In addition, to the occurrence of AMR, his work also examined the efficacy of high temperature manure and biosolid treatment systems (e.g., anerobic digestion, thermal hydrolysis) in mitigating AMR. A variety of methodologies, such as analytical chemistry (LC-MS), molecular biology (DNA extractions, qPCR,16S sequencing) and microbial ecology, were employed to achieve results. The project collectively tracked the concentrations of antibiotics, antibiotic resistant genes and bacteria movement through agricultural and wastewater systems.

Following his doctoral studies Dr. Poindexter was an Oak Ridge Institute Science and Education (ORISE) Postdoctoral Fellow at the USDA. Dr. Poindexter's work at the USDA focused on the utilization of UHPLS-MS system for the identification and quantitation of for various organic contaminants, pesticides, antibiotics, nutrients, and soil metabolites to support sustainable agriculture.

Academic Credentials & Professional Honors

Ph.D., Environmental Science and Technologies, University of Maryland, College Park, 2023

M.S., Biotechnology, Texas Tech University, 2018

B.S., Biology, Webster University, 2015

Oak Ridge Institute of Science and Education (ORISE) Postdoctoral Fellowship (2022-2024)

University of Maryland, College of Agriculture and Natural Resources Ph.D. Student of the Year (2023)

University of Maryland, Department of Environmental Science and Technology Trail Blazer Award (2023)
National Science Foundation -Research Trainee Fellowship (2020)

Academic Appointments

Adjunct Professor, Earth, Environment & Equity, Howard University, 2024-Present

Adjunct Professor, Department of Sociology, American University, 2022

Adjunct Professor, Department of Biology, Trinity Washington University, 2021-2022

Prior Experience

Faculty Assistant, University of Maryland, 2024-2025

National Director for Black Male Initiative & DC EJ Organizer, Young, Gifted & Green, 2023-2025

ORISE Postdoctoral Fellow, USDA, 2022-2024

Professional Affiliations

American Ecological Engineering Society 2022

American Society of Agricultural and Biological Engineers 2021- Present

Publications

Poindexter C, Yarberry A, Rice C, Lansing S. Antibiotic resistance partitioning during on-farm manure separation and high temperature rotary drum composting. Journal of Environmental Sciences 2025; 152:701-713.

Poindexter C, Yarberry A, Rice C., Lansing S. Quantifying antibiotics distribution in solid and liquid fraction using a two-step, multi-residue antibiotic extraction. Antibiotics 2022; 11(12):1735.

Presentations

Poindexter C. Fate of antibiotics residues, antibiotic resistant bacteria and antibiotic resistance genes in US diary manure management systems. ABIOTEC II Webinar, Virtual, Germany, 2023.

Poindexter C, Lansing S, Yarberry A, Rice C, Georgakakos C, Gooch C, Lansing S. A mass balance approach to antibiotic resistance partitioning in dairy manure through a continuous high temperature rotary drum composting bedding recovery unit. American Society for Agricultural and Biological Engineering, Houston, TX, 2022.

Poindexter C, Yarberry A, Rice C, Lansing S. Correlation of antibiotic resistance and temperature during anaerobic digestion of dairy manure. American Ecological Engineering Society, Baltimore, MD, 2022.

Poindexter C, Yarberry A, Rice C, Lansing S. Comparative analysis of mesophilic and thermophilic anaerobic digestion on the reduction of antibiotic resistance within diary manure. American Society of Microbiology, Washington DC, 2022.

Poindexter C, Yarberry A, Rice C, Lansing S. Two-step multi-residue antibiotic extraction method for comparison of antibiotics concentrations in manure as it moves through a manure treatment system. American Society of Mass Spectrometry, Minneapolis, MN, 2022.

Poindexter C. Environmentalism: society and the environment. Summer Search, Oakland, CA, July 27, 2020.

Project Experience

Developed methodology for multi-class multi-residue antibiotics extraction in diary manure for LC-MS analysis. This uniform method can be applied to various manure substrates and is the first method to attempt to standardize antibiotic extraction in manure.

Designed and conducted studies and assessments for various on-farm dairy manure management systems and biosolids products prior to field application. Conducted and analyzed sampling methodologies and lab results to determine system function and efficacy in the reduction of antibiotics (tetracycline, macrolides, sulfonamides and B-lactams) and corresponding resistance genes and bacteria. A mass balance was conducted to document the fate and transport of antibiotics. Other lab analysis included bacterial nutrient analysis, resistant bacteria identification and resistance gene quantification via qPCR.

Conducted an in-depth analysis of policies related to anaerobic digestion (AD) adoption by comparing US policies to other countries with higher AD adoption rates. A survey instrument was developed for farmers, policy makers, and extension associates to assess overall knowledge, gage policy impact, and identify obstacles in AD adoption within the US.

Led the development and implementation of programming to engage communities of color on environmental justice topics such as sustainability and environmental health. Serving on committees and coalitions leading the design, development and execution of various workshops, townhalls and other community engagement events. Facilitated a national series of conversations at Black barber shops, providing a platform of people for directly impacted communities to learn about data, research, and environmental policies.