Biotechnology and Biological Sciences Research Council

Engineering and Physical Sciences Research Council

EBNet Travel Bursary Support
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(*TB202308*)

EBNet
Environmental Biotechnology

10th IWA Microbial Ecology & Water Engineering conference (MEWE)

10-14 Sept 2023, Brisbane, Australia

Presentation:
Metagenomic insights into the evolution of the microbiome and antibiotic resistome in commercial biogas planyts operating at hyper-mesophilic temperature
Mac-Anthony Nnorom et al., University of Surrey

The bursary covered the cost of travel to the 10th IWA Microbial Ecology and Water Engineering Specialist Conference in Brisbane, Australia, where I made an oral presentation of a research study undertaken as part of my PhD. In the study, shotgun metagenomic sequencing was deployed for comparative characterization of the microbiome and antimicrobial resistance trends (AMR) in five full-scale commercial biogas plants operating at hyper-mesophilic temperatures and utilizing a blend of energy crops, brewery wastes, and animal manure as substrates.

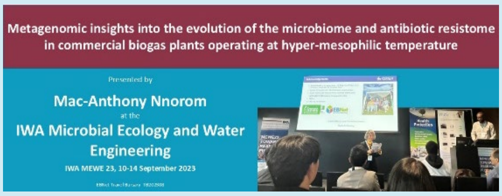
The study aligns with two out of the three research themes within EBNet's remit: (a) Pollutants and media, and (b) Biosciences to engineering. In the case of the first theme, the study identifies antibiotic resistance genes (ARGs) as critical environmental pollutants and comprehensively captures their fate from the feedstock down to the primary and secondary phases of industrial-scale anaerobic digestion (AD). It is widely acknowledged that the abundance of ARGs in the digestate (anaerobically digested waste) should be curtailed to ensure the usual practice of recycling digestate to agricultural lands does not constitute serious public health risks. The results of the AMR trends derived from the study could ultimately provide a realistic baseline for the assessment of risks from digestate-borne ARGs.

https://www.youtube.com/watch?v=Pv5ZcV-sc3M

Presenting at MEWE 10

The study also very much fits into the second theme – Biosciences to engineering – which focuses on the application of novel sequencing technologies and bioinformatics to the development, improvement, and exploration of complex microbial systems. Information about the dynamics of the microbiome and resistome profile as a consequence of different process conditions (e.g., temperature and substrate type) was obtained in the study using metagenomics. Such information could be exploited for the design of more efficient, stable, and robust AD systems.

My experience at the conference was indeed enriching and rewarding. I highly appreciate EBNet for providing the travel bursary that enabled me to attend. My personal highlight was getting to attach faces to the admirable researchers whose work(s) I have read and cited in the past.



Metagenomic insights into the evolution of the microbiome and antibiotic resistome in commercial biogas plants operating at hyper-mesophilic temperature

Presented by
Mac-Anthony Nnorom
at the
IWA Microbial Ecology and Water Engineering
IWA MEWE 23, 10-14 September 2023
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