EBNet Environmental Biotechnology

PROJECT PARTNERS:
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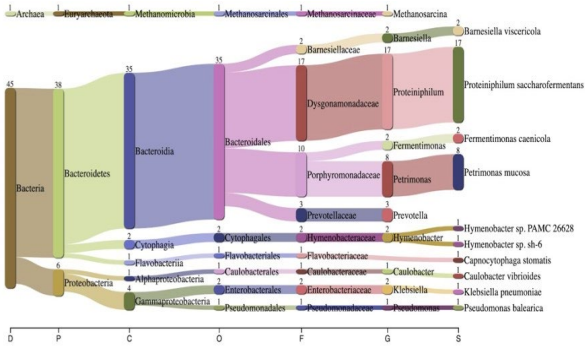
Determination of microbial communities of laboratory anaerobic digestion tanks and impact of Crechar® additive on community dynamics

"Our collaboration with Prof Chong and his group has been instrumental in making the first steps towards building a pipeline for analysis of microbial communities in anaerobic digestion. This will help us to further develop our expertise in this area, and ultimately will allow us to optimise our CreChar product. I am looking forward to continuing our collaboration with Prof. Chong, possibly within the remit of his new Cloud SPAN project". Dr Adam Ostrowski, Carbogenics Ltd.

AIM

Carbogenics Ltd has developed a novel carbon additive CreChar® intended to increase the stability and process efficiency of Anaerobic Digestion plants. CreChar® is expected to facilitate microbial interactions, biofilm development and increases in the abundance of essential microbial taxa. Carbogenics recently acquired a MinION sequencer from Oxford Nanopore Technologies and obtained a large quantity of genomics data from various experimental reactors. However, very little information is available on the microorganisms commonly found in AD, and the MinION technology is very young and currently not supported by user-friendly analysis software. Carbogenics managed to process approx 30% of the obtained data, but lacked the expertise required to unlock all the information in the datasets. The company wanted to partner with Prof James Chong's group at the University of York, who are leaders in development of the tools for AD metagenomics.

"I hope our analyses will provide useful insights that can be used by Carbogenics to further develop its products. Working together has demonstrated a clear need for more accessible training to boost microbial community analysis expertise in small companies who are developing exciting innovations on limited budgets and short time-scales. I hope our Cloud-SPAN project will help to address that need". Professor James Chong, University of York



RESULTS

Cutting-edge DNA sequencing technologies such as Oxford Nanopore Technologies' MinION sequencer are democratising science and making DNA sequencing routinely possible in nontraditional settings such as SMEs and micro-businesses. However, the expertise and computational hardware required to make full use of this data currently trails our ability to generate it.

Our collaboration supported the interpretation of Carbogenics' in-house generated data using University of York high performance computing (HPC) infrastructure and expertise. In addition to providing biological insights into how Carbogenics' CreChar® additive supports the productivity of anaerobic digestion, the data analysis carried out in this project will allow Carbogenics to further refine its products.

As well as directly supporting Carbogenics' investigations, our project has highlighted a skills (and infrastructure) gap that we think can be filled though on-line training and HPC resources.

https://cloud-span.york.ac.uk