EBNet Environmental Biotechnology

PROJECT PARTNERS:
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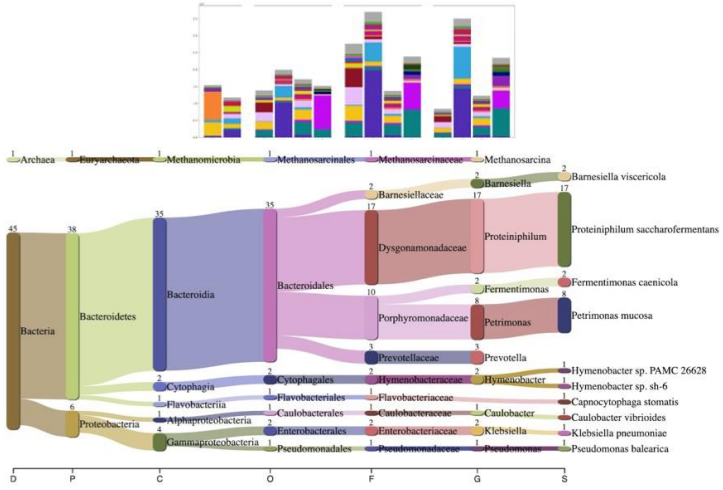
Determination of microbial communities of laboratory Anaerobic Digestion tanks and impact of the CreChar® additive on the microbial community dynamics

"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 have developed a novel carbon additive CreChar® intended to increase the stability and processivity of Anaerobic Digestion plants. CreChar® is expected to facilitate microbial interactions, biofilm development and increase in the abundance of the essential microbial taxa. Carbogenics recently acquired a MinION sequencer from Oxford Nanopore Technologies and obtained large quantity of genomics data from various experimental reactors. However, there is very little information available on the microorganisms commonly found in AD and the MinION technology is very young and currently not supported by user-friendly analysis software. At Carbogenics, we managed to process approx. 30% of the obtained data but we lack the expertise required to unlock all the information in the datasets. We would like to partner with the group of Prof James Chong, University of York, who are leaders in the development the tools for metagenomics of AD. The Chong Group are the frontrunners in the analysis of the data output by the nanoporebased sequencers and are a natural choice for a partner to understand the information in the data.

"I hope our analyses will provide useful insights that can be used by Carbogenics to further develop their 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 new 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 we carried out in this project will allow Carbogenics to further refine their 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.