

Unraveling novel syntrophic propionate oxidizing candidates enriched from high-ammonia biogas digesters

Maria Westerholm

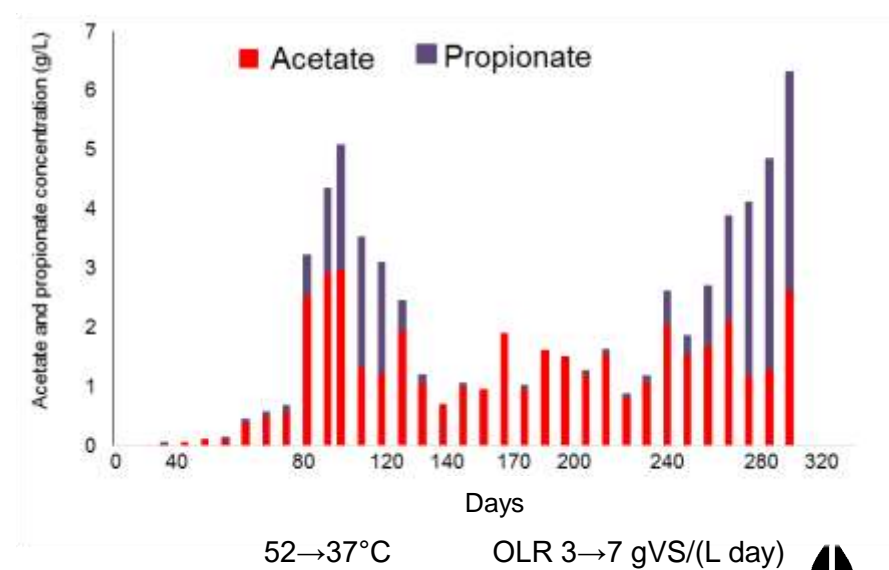
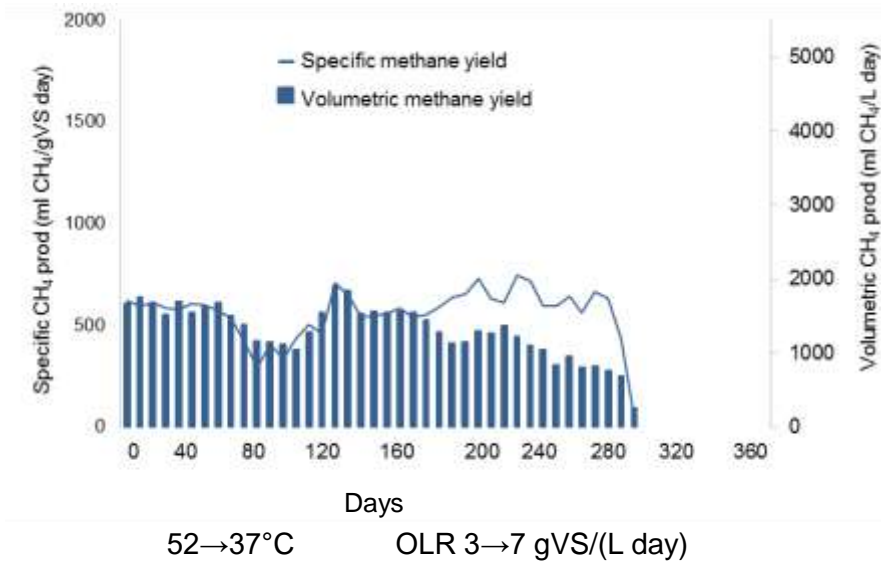
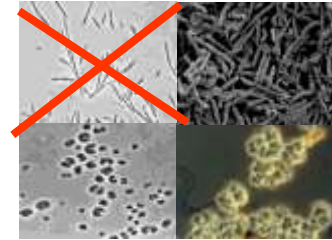
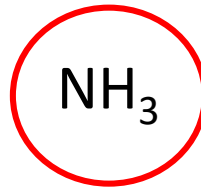
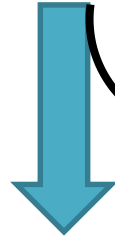
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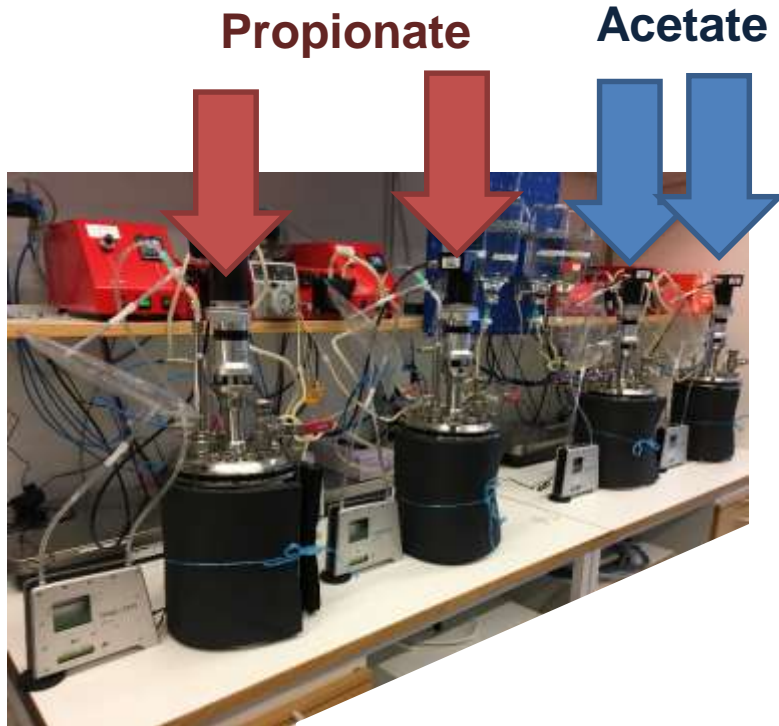
AD Network Research Colloquium 2019-01-24

AD of proteins - ammonia inhibition – propionate accumulation

Proteins



Enrichment of ammonia-tolerant propionate degraders



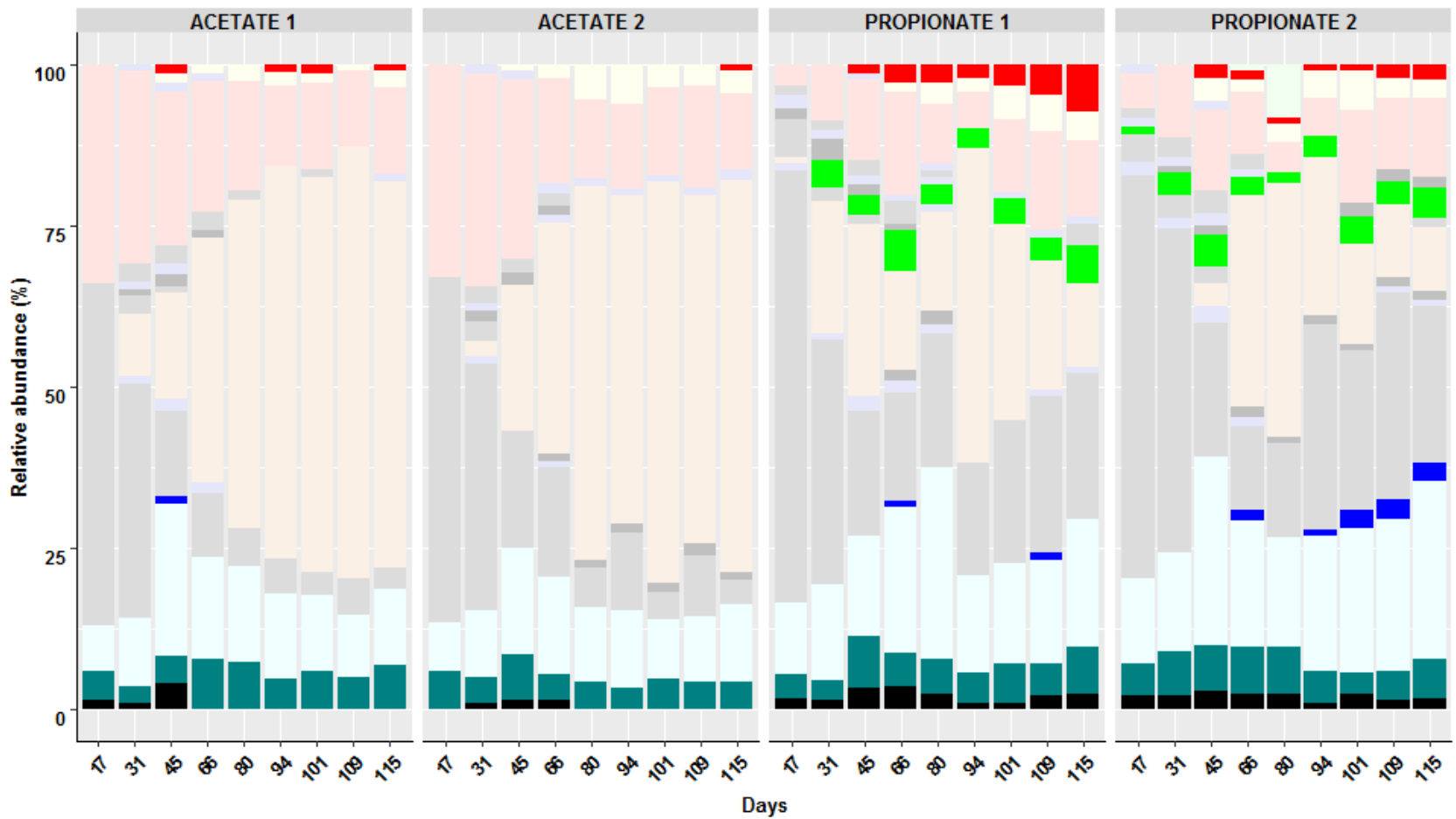
Temp: 37°C

Inoculum: high-ammonia biogas digester

Feed: High-ammonia (6 g/L N-NH₄⁺) mineral medium

Operation: HRT 30 days, 120 days of operation

Molecular methods: Illumina 16S rRNA gene and metagenome sequencing

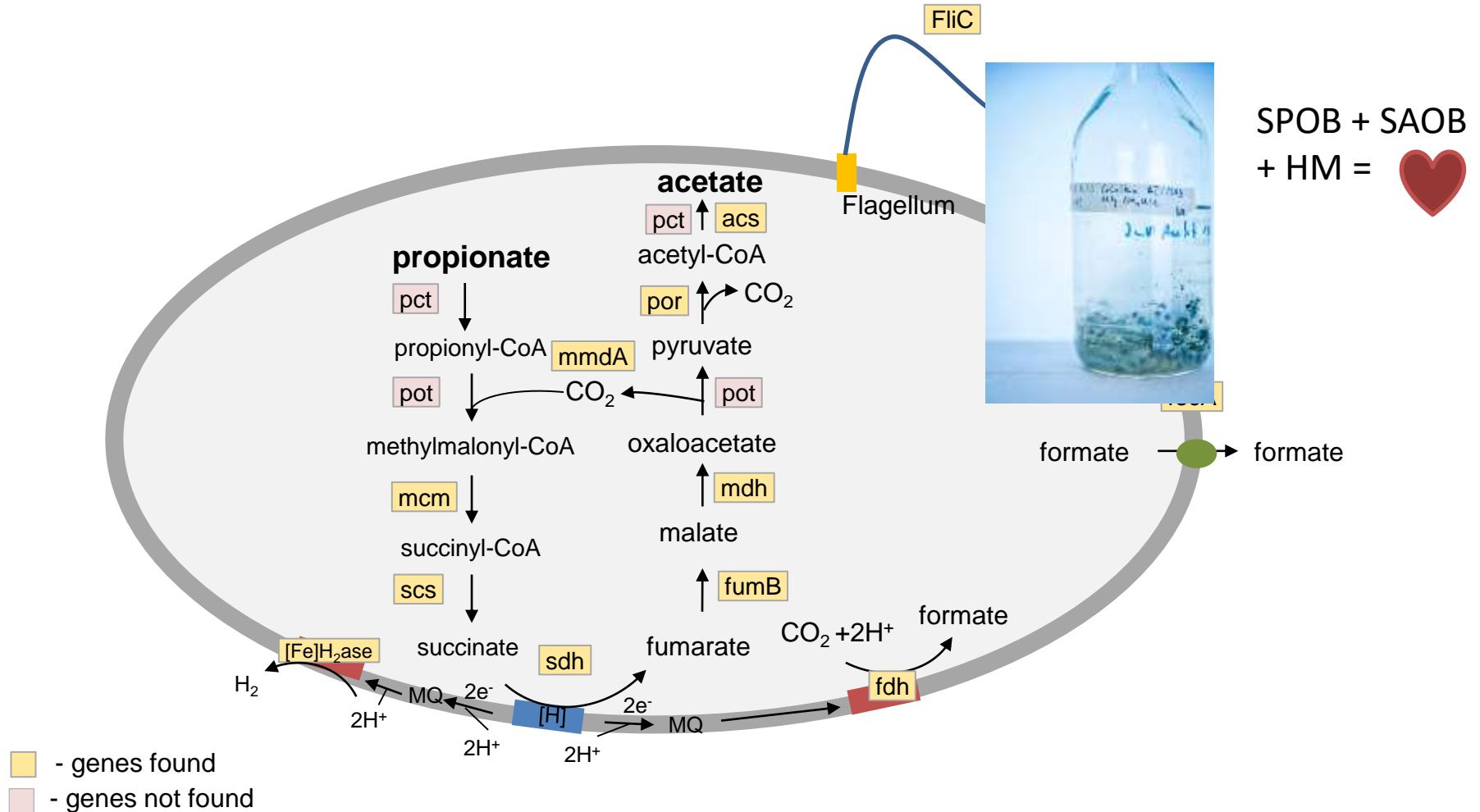


Family

- Bacillaceae
- Caldicoprobacteraceae
- Campylobacteraceae
- Christensenellaceae
- Clostridiaceae_2
- Draconibacteriaceae
- Family_XI
- Family_XII
- Gracilibacteraceae
- Oligosphaeraceae
- Peptococcaceae
- PL-11B10
- Porphyromonadaceae
- Pseudomonadaceae
- Rikenellaceae
- Ruminococcaceae
- ST-12K33
- Synergistaceae
- Thermoanaerobacteraceae
- x-Minor family
- NA

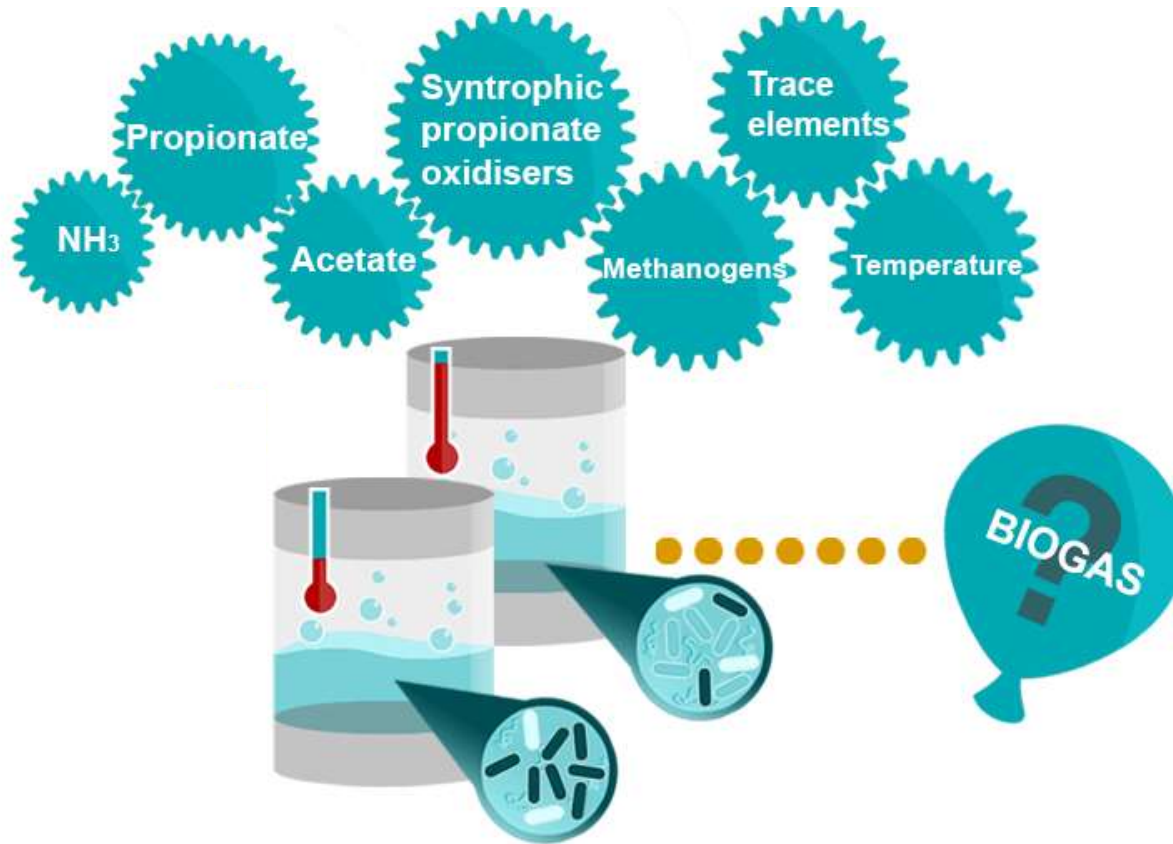
Reconstruction of metagenome-assembled genomes (MAGs)

Confirmed to be novel species – contained the majority of essential genes required for syntrophic propionate oxidation

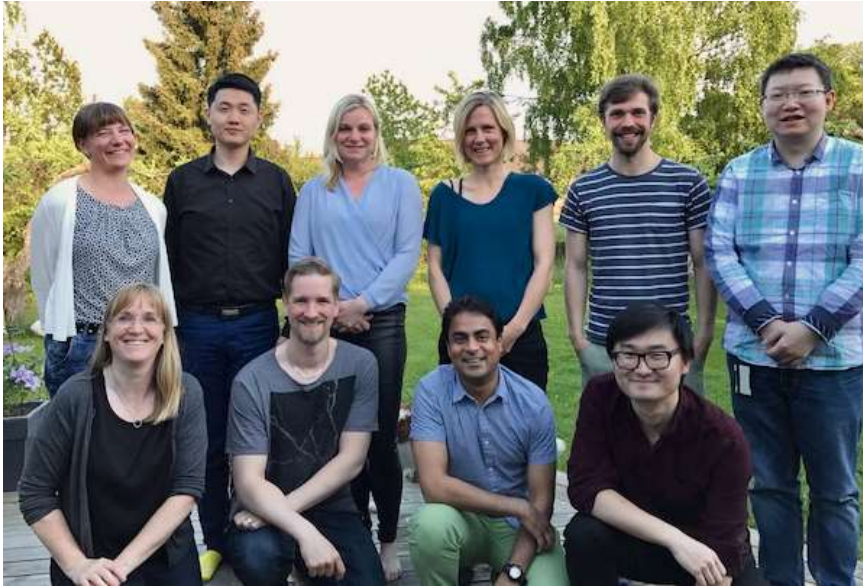


The first step has been taken to answer...

How to promote propionate degradation at high ammonia?



Thank you for your attention!



The biogas group at SLU

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Interested in collaboration?

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