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Nutrient Removal & Energy Production via Microbial N_2O Generation from Wastewater

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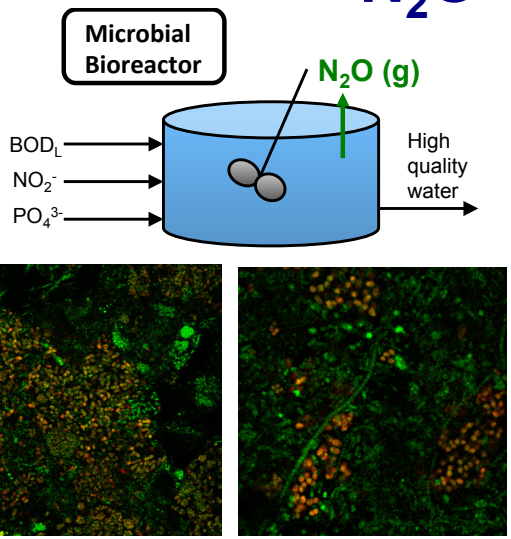
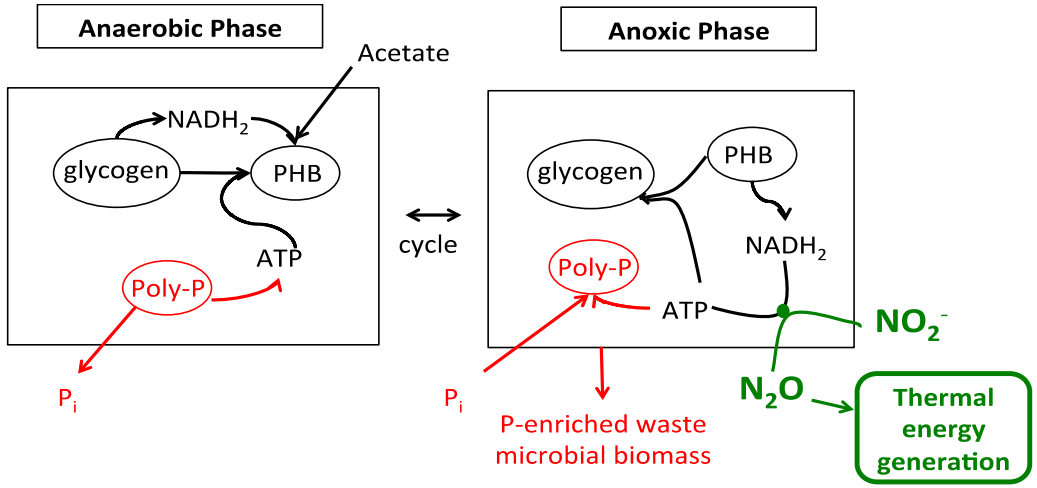


Green=all bacteria
Yellow=Phosphorus Accumulating Organisms



- Nitrous oxide (N_2O) is a potent greenhouse gas and an unwanted byproduct of microbial nitrogen (N) transformations in biological wastewater treatment plants. It is also a powerful potential energy source, as evidenced by its use as a monopropellant in rocket engines and as a power boosting oxidant in race cars.
- This project led to development of novel prototype microbial bioreactor system for conversion of waste to energy via microbial N_2O generation, with concomitant removal of detrimental reactive nitrogen (N) and phosphorus (P) from wastewater.
- Such a system may allow, for the first time, direct bioenergy production from low quality wastewater coupled to complete nutrient (N and P) removal.

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