

# Microbial species interactions facilitating anaerobic plant degradation in adapted soil communities

IGERT Associate Amy Biddle

PI: Jeffrey Blanchard (UMass Microbiology)

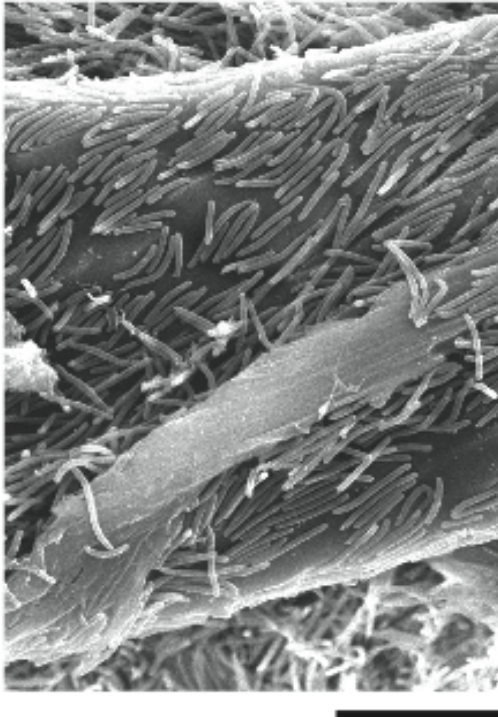


FIG. 1. Scanning electron micrograph of *C. hutchinsonii* cells digesting cellulose filter paper. Bar, 10  $\mu\text{m}$ . Xie G, et al. 2007.

My long-term goal is to understand microbial communities involved in the cycling of plant detritus in anaerobic environments, including forest, wetland soils and animal digestive systems. I hypothesize that effective plant degradation results from metabolic and spatial interactions between microbial community members. These interactions can be more easily teased apart in a simplified microbial community adapted for growth on plant detritus in the laboratory. My research involves:

- (1) Establishing microcosms from forest soil, and characterizing the diversity and metabolic properties of the communities as they adapt over time.
- (2) Identifying genes and enzymes that enable more efficient substrate utilization of microbial consortia on the community level.
- (3) Visualizing the spatial arrangement and localization of metabolic activities of microcosm consortia over time.

This research has implications for studies related to climate change, gut microbe-host interactions, waste management, and biofuels development.