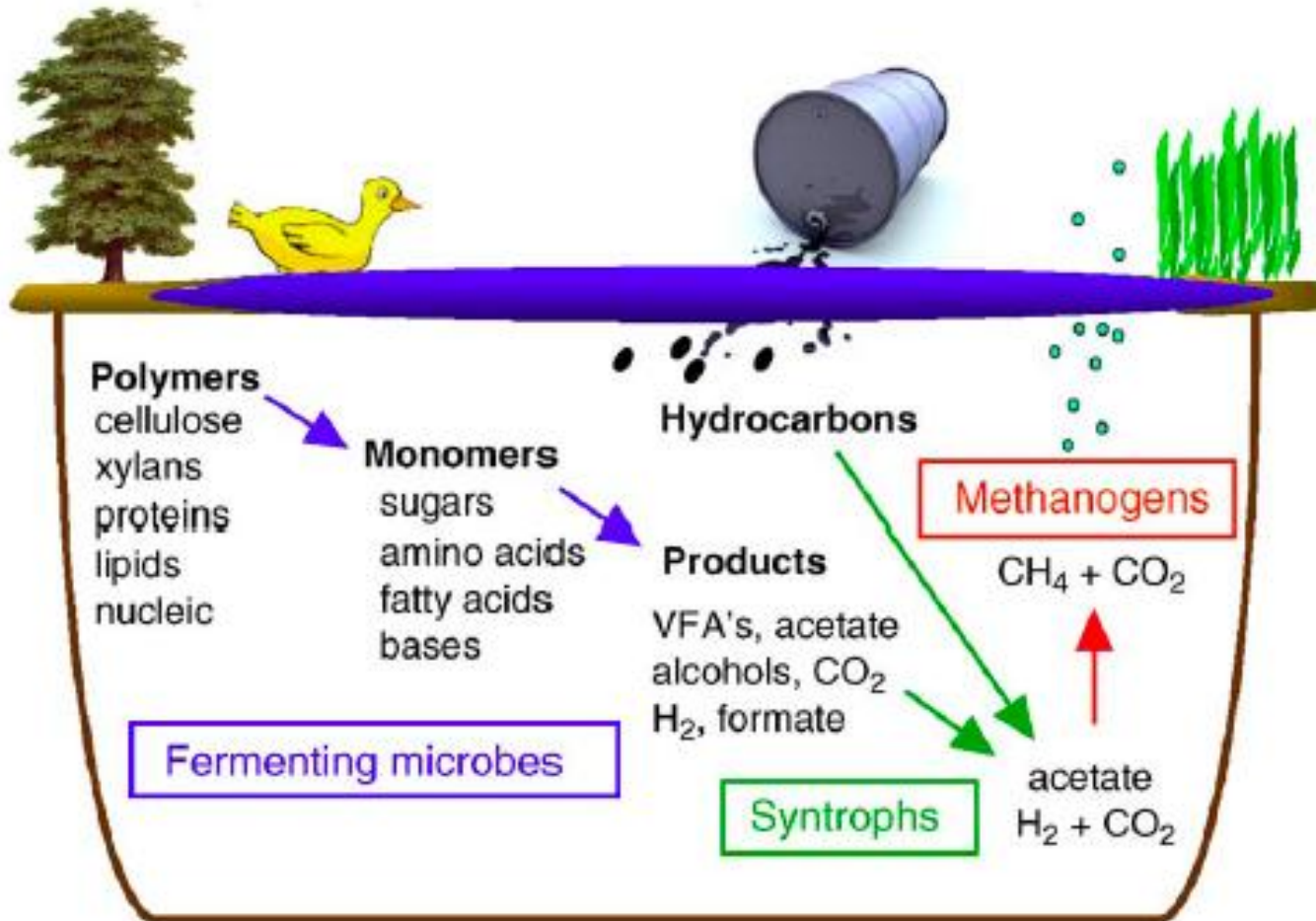


Microbial Geotechnology

Using cutting edge technologies to understand microbial processes and develop remediation and energy technologies

Michael J. McInerney
University of Oklahoma

Methane: Nature's Biofuel



Current Opinion in Biotechnology

(McInerney et al. Current Opin. Biotech. 20:623, 2009)

Key aspect of global carbon cycle

Degradation occurs in discrete steps

Consortium is the catalytic unit

Key players and functions still unclear

Interspecies interaction critical but largely unknown

Coal



Oil and Oil Shale



Biomass



1. Who's there?
sequencing, microscopy, cultivation

2. What are they doing?
functional genomics, activity



Methane
 CH_4

3. How to manipulate?
Limiting factors?
Stimulating factors?

Why Microbial Geotechnology

- Unprecedented strength in anaerobic microbiology
- Established collaborations
 - OU, OSU and U. of Tulsa
 - Chemistry, environmental science, engineering, bioinformatics
- Cutting edge “omic” approaches
 - High-throughput sequencing
 - Bioinformatics-network analysis
 - Functional genomics: GeoChip, transcriptomics
- Traditional ties with energy and biotech companies-tech transfer
- Strong educational commitment
 - Team-based learning
 - Capstone activities
 - Graduate training