























 Institute of Environmental Studies - The University of Tokyo

 Why does the anaerobic zone favor phosphate accumulating organisms (PAOs)?

 Because hydrolysis of polyphosphate stored in the cell can supply energy for the uptake of carbon sources under the anaerobic conditions where no electron acceptors are available.



















Α	naerob	ic Cark	oon Me	taboli	sm by PA	Os
	Theoretical or Observed	Glycogen (or Carbo-	Substrate Taken up	PHA Produce d	% of Acetyl-CoA or Propionyl-CoA needed for PHA synthesis	
		Hydrate) consumed			Acetyl-CoA	Propionyl- CoA
Acetic Acid	Theoretical	1	6	4	100	0
	Observed	1.2	6	3.9	95	5
Propionic Acid	Theoretical	1	6	4	25	75
	Observed	1.1	6	4.0	25	75



Institute of Environmental Studies - The University of Reported Presence of GAOs						
Reference	Carbon Sources	Causative Operation	Note			
Matsuo <i>et al</i> , (1982)	Diluted night soil	Seed sludge from night soil treatment plant	When seeded by EBPR sludge, good P removal achieved.			
Fukase <i>et al</i> , (1984)	Ac, Pep, YEx	Long SRT and HRT (54 days)	PHB accumulated anaerobically.			
Cech/Hartman (1990/1993)	Ac, Glu	Addition of Glucose	PHB accumulated and glycogen consumed anaerobically.			
Matsuo <i>et al</i> , (1994)	Pep, Ac, Prop	Unclear	P removal recovered by extending anaerobic retention time.			
Liu <i>et al</i> (1994)	Ac, Pep	Limited Phospho- rus feeding	PHB accumulated and glycogen consumed anaerobically.			
Satoh <i>et al</i> (1994)	Ac, Prop, Pep, YEx	Unclear	PHB accumulated and glycogen consumed anaerobically.			





ரி



## Institute of Environmental Studies - The University of Tokyo

- Who are responsible for EBPR?
- Who are PAOs?

## <Difficulty in isolation of PAOs>

- \* Microlunatus phosphovorus (Nakamura et al.)
- Anaerobic P release and C uptake observed
- No anaerobic acetate uptake accompanied
- by PHA storage
- \* Loss of key characteristics of the EBPR metabolism after isolation (anaerobic PHA storage lost)















