

## Supporting Information Cover Sheet

**Journal:** Environmental Science & Technology

**Title of Manuscript:**

Metabolic-state based Identification and Quantification of Functionally Relevant Populations in Enhanced Biological Phosphorus Removal Processes via Raman Microscopy

### Authors list:

Nehreen Majed<sup>1</sup> and April Z. Gu<sup>1\*</sup>

<sup>1</sup>Dept. of Civil & Environmental Engineering, 360 Huntington Ave, Northeastern University, Boston, MA 02115

\*Corresponding author

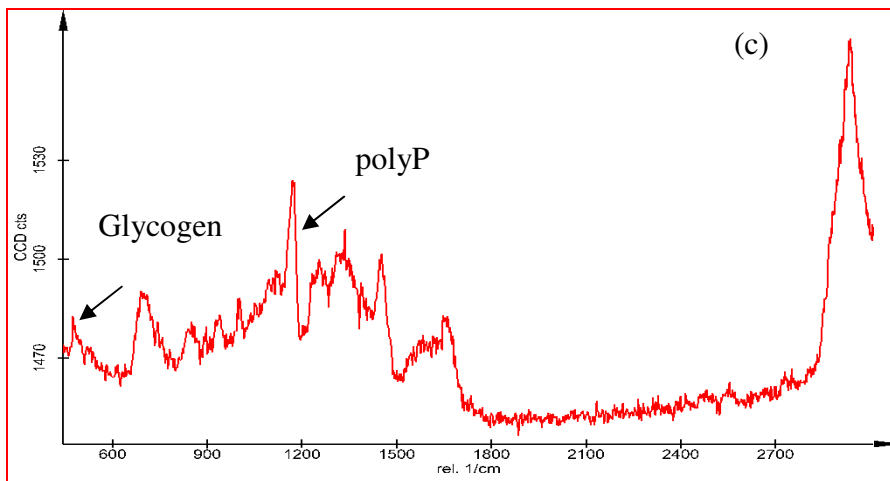
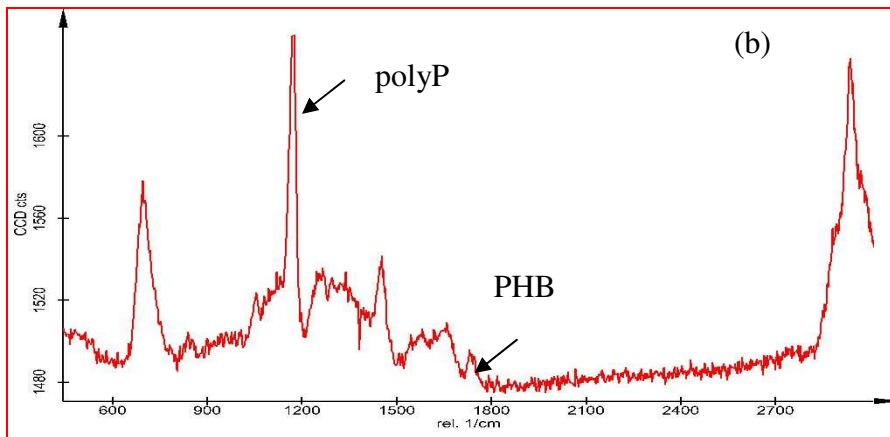
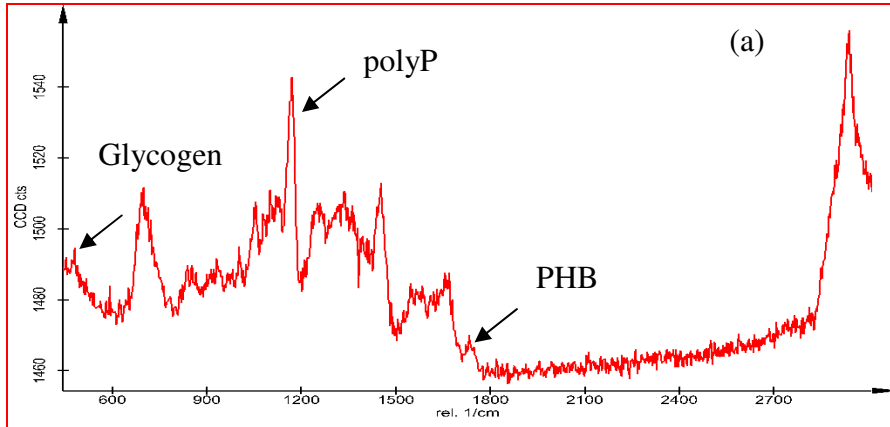
### Summary of SI:

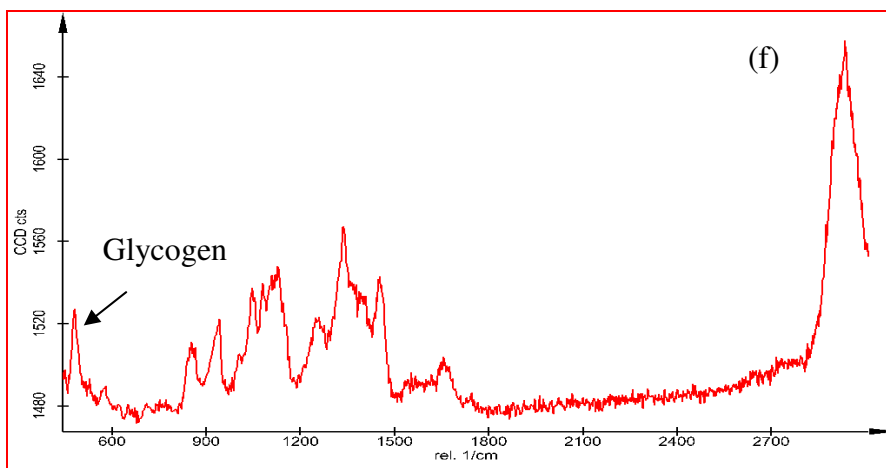
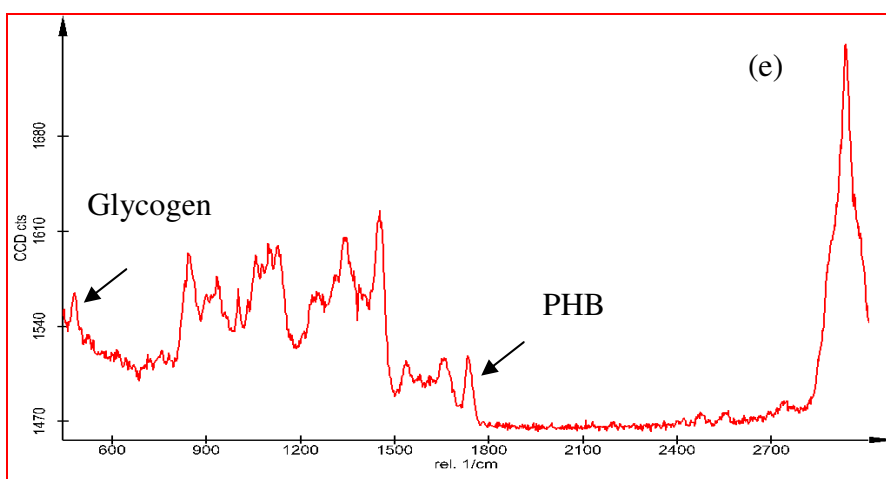
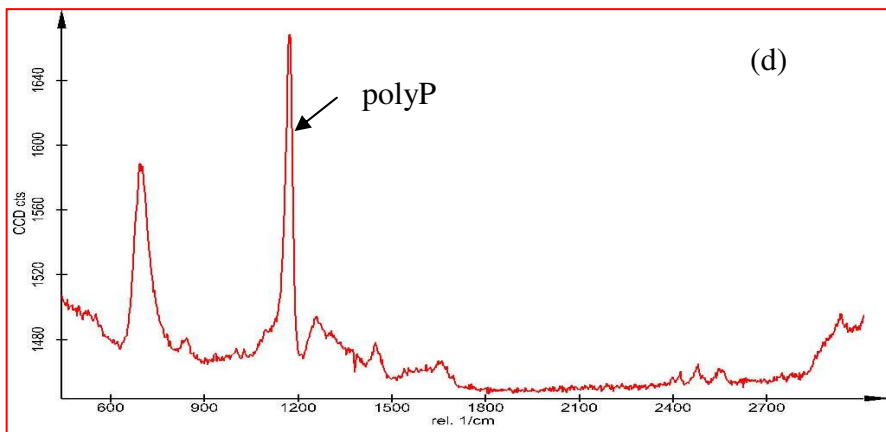
Figure no.	Figure Description	Page no.
STable 1	Details on oligonucleotide probes used for FISH in this study and their respective target groups	S1
SFigure 1	Enlarged versions of Raman spectra for different combinations of polymeric inclusions in cells corresponding to figure 1	S2
SFigure 2	Orthophosphate and acetate profiles for the batch testing	S5
SFigure 3	Schematic of anaerobic biochemical pathways employed by PAOs for energy (ATP) and reducing power (NADH) production and for intracellular PHAs formation	S6

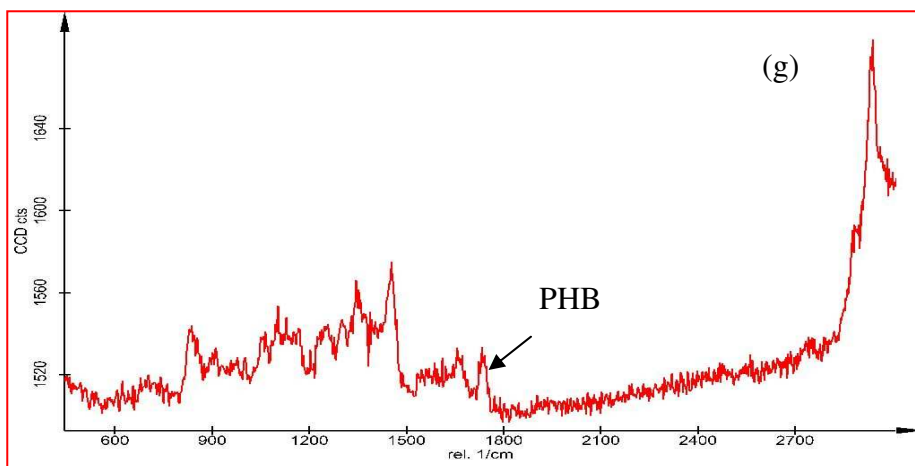
## SUPPORTING INFORMATION

STable 1: Details on oligonucleotide probes used for FISH in this study and their respective target groups

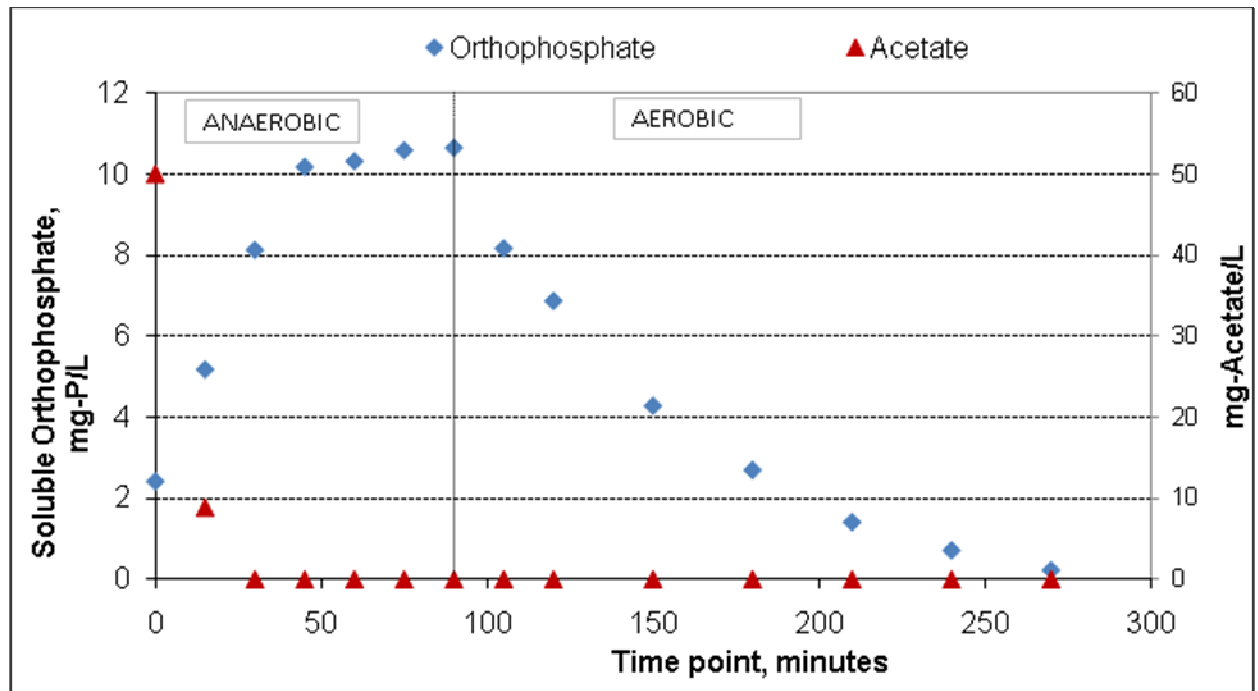
Probe	Sequence	Fluorescent labels	Specificity	% Formamide	Reference
EUB338	GCTGCCTCCCGTAGGAGT	FAM	Bacteria	20	(Amann, 1990)
PAO462	CCGTCATCTACWCAGGGTATTAAC	CY3	Most <i>Accumulibacter</i>	35	(Crocetti et al., 2000)
PAO651	CCCTCTGCCAAACTCCAG	CY3	Most <i>Accumulibacter</i>	35	(Crocetti et al., 2000)
PAO846	GTTAGCTACGGCACTAAAAGG	CY3	Most <i>Accumulibacter</i>	35	(Crocetti et al., 2000)
Actino-221a	CGCAGGTCCATCCCAGAC	FAM	<i>Actinobacteria</i>	35	(Kong et al., 2005)
Actino-658a	TCCGGTCTCCCCTACCAT	FAM	<i>Actinobacteria</i>	35	(Kong et al., 2005)
GAOQ431	TCCCCGCCTAAAGGGCTT	CY5	Some <i>Competibacter</i>	35	(Crocetti et al., 2002)
GAOQ989	TTCCCCGGATGTCAAGGC	CY5	Some <i>Competibacter</i>	35	(Crocetti et al., 2002)
GB	CGATCCTCTAGCCCACT	FAM	Most <i>Competibacter</i>	35	(Kong et al., 2002)
DF988	GATACGACGCCCATGTCAAGGG	CY5	<i>Defluvicoccus</i> Cluster 2	35	(Meyer et al., 2006)
DF1020	CCGGCCGAACCGACTCCC	CY5	<i>Defluvicoccus</i> Cluster 2	35	(Meyer et al., 2006)
H966	CTGGTAAGGTTCTGCGCGTTGC	-	Helper probe for DF	-	(Meyer et al., 2006)
H1038	AGCAGCCATGCAGCACCTGTGTGGCGT	-	Helper probe for DF	-	(Meyer et al., 2006)



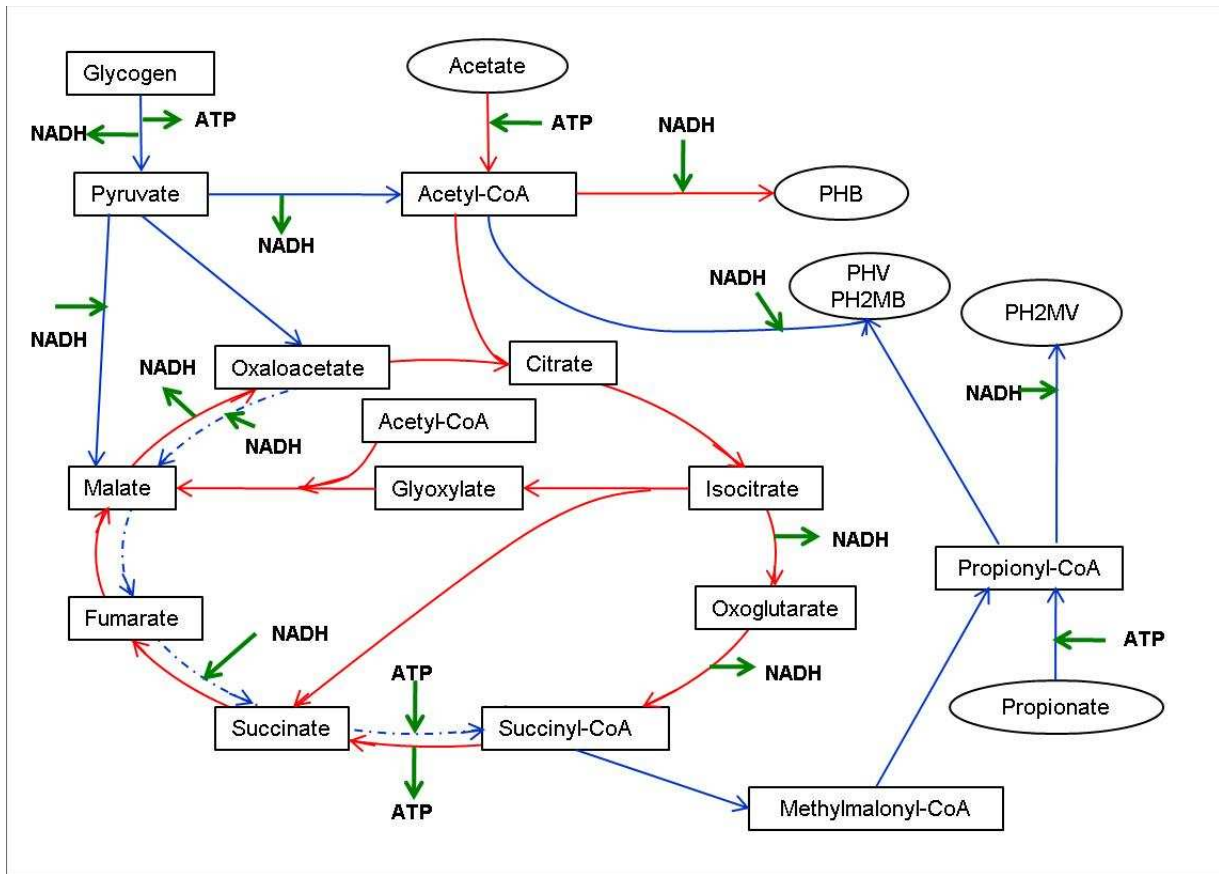




**SFigure 1: Enlarged versions of Raman spectra of different combinations of polymeric inclusions corresponding to figure 1. Spectra represent cells containing (a) polyP+glycogen+PHB; (b) polyP+PHB; (c) polyP+glycogen; (d) polyP only ; (e) PHB+ Glycogen; (f) Glycogen only and (g) PHB only. Spectra for those cells that contained non-detectable level of any of the three polymers are not shown.**



**SFigure 2: Orthophosphate and acetate profiles for the batch testing**



**SFigure 3: Schematic of anaerobic biochemical pathways employed by PAOs for energy (ATP) and reducing power (NADH) production and for intracellular PHAs formation. Possible pathways proposed include different extent and combinations of the glycolysis pathway (blue line), succinate-propionate pathway (blue dotted line), partial or full TCA cycle pathway (red line). (Adopted from Martin et al (2006)[34])**