

Supporting Information

Solvent optimization for bacterial extracellular matrices: a solution for the insoluble

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Table S1 Summary of solubilities of biofilms in all the organic solvents and ionic liquids screened.

	<i>P. aeruginosa</i> RSCV	GAO- enriched granules	DPAO granules	Glycogen
Ionic liquids				
1-ethyl-3-methylimidazolium	High	High	High	High

acetate (EMIM-Ac)				
1-ethyl-3-methylimidazolium diethyl phosphate (EMIM-DEP)	High	High	High	High
1-butyl-3-methylimidazolium chloride (BMIM-Cl)	High	High	High	High
1,3-dimethylimidazolium methylsulfate	Very Low	Very Low	Very Low	Not considered
1-Butyl-3-methylimidazolium bis(trifluoromethylsulfonyl)imide	Very Low	Very Low	Very Low	Not considered
Trihexyl(tetradecyl)phosphonium bis(trifluoromethylsulfonyl)imide	Very Low	Very Low	Very Low	Not considered
1-Butyl-3-methylimidazolium tetrafluoroborate	Very Low	Very Low	Very Low	Not considered
N-Butyl-1-methylpyrrolidinium dicyanamide	Very Low	Very Low	Very Low	Not considered
Trihexyl(tetradecyl)phosphonium tris(pentafluoroethyl) trifluorophosphate	Very Low	Very Low	Very Low	Not considered
1-Butyl-3-methylimidazolium tris(pentafluoroethyl)trifluorophosphate	Very Low	Very Low	Very Low	Not considered
1-Butyl-1-methyl-pyrrolidinium tetracyanoborate	Very Low	Very Low	Very Low	Not considered
Organics				
Ethanolamine	Medium	Medium	Medium	High
Dimethyl sulfoxide	Very Low	Very Low	Very Low	High
Dimethylformamide	Very Low	Very Low	Very Low	High

Dimethylacetamide	Medium	Medium	Low	High
Diethylene glycol	Very Low	Very Low	Very Low	High
2-pyrrolidone	Very Low	Very Low	Very Low	High
Allyl alcohol	Very Low	Very Low	Very Low	Very Low
Propylene Carbonate	Very Low	Very Low	Very Low	Very Low
1-butanol	Very Low	Very Low	Very Low	Very Low
2-butanol	Very Low	Very Low	Very Low	Very Low
2 propanol	Very Low	Very Low	Very Low	Very Low
Water	Very Low	Very Low	Very Low	High

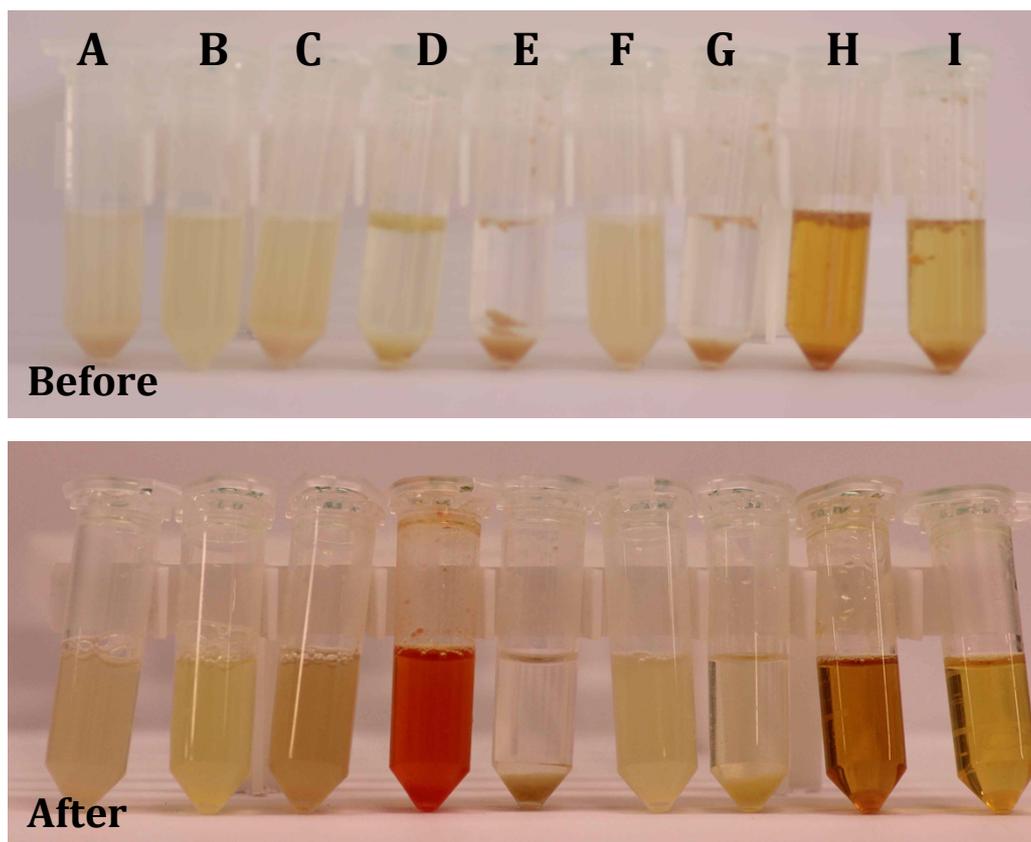


Fig. S1 Representative images of *Pseudomonas aeruginosa* RSCV pellicle biofilms in phosphate buffer solution (PBS) pH 7 (10 mg dry solid/mL solvent) (A) PBS with NaOH to pH 10.0 (B), in Luria Bertani (LB) broth (C), ethanolamine (D), 1-butanol (E), ammonium bicarbonate buffer solution (50 mM), NaOH to pH 10.3 (F), N,N-dimethylacetamide (DMAc) (G), 1-ethyl-3-methylimidazolium acetate (EMIM-Ac) (H) and 40:60 EMIM-Ac:DMAc (I) before and after solubilisation for 3 days at 60 °C.

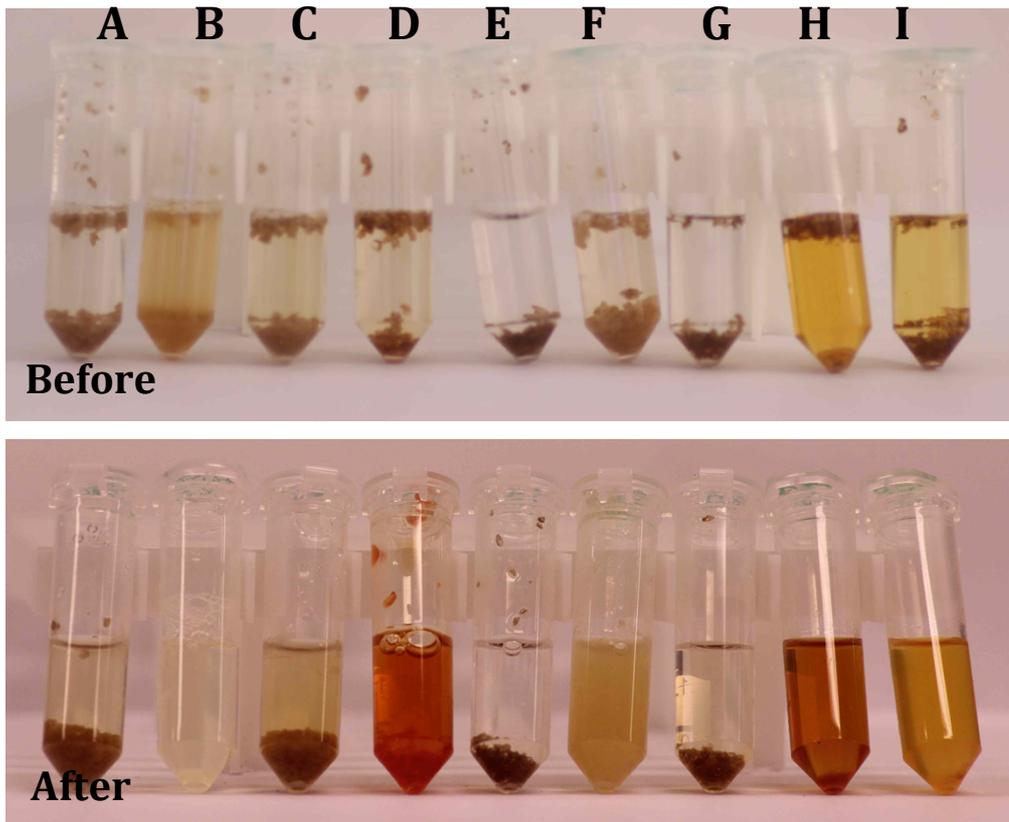


Fig. S2 Representative images of Glycogen Accumulating Organism-enriched granular biofilms in phosphate buffer solution (PBS) pH 7 (10 mg dry solid/mL solvent) (A) PBS with NaOH to pH 10.0 (B), in Luria Bertani (LB) broth (C), ethanolamine (D), 1-butanol (E), ammonium bicarbonate buffer solution (50 mM), NaOH to pH 10.3 (F), N,N-dimethylacetamide (DMAc) (G), 1-ethyl-3-methylimidazolium acetate (EMIM-Ac) (H) and 40:60 EMIM-Ac:DMAc (I) before and after solubilisation for 3 days at 60 °C.

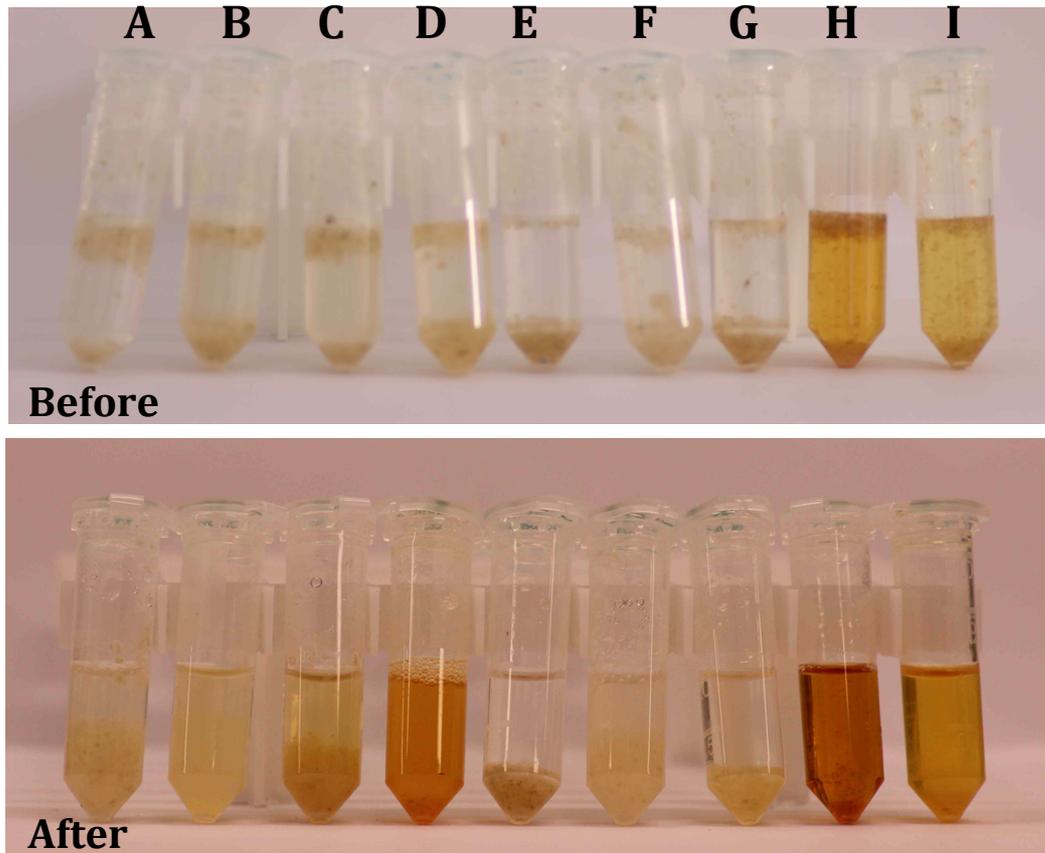


Fig. S3 Representative images of Denitrifying Polyphosphate Accumulating Organism-enriched granular biofilm in phosphate buffer solution (PBS) pH 7 (10 mg dry solid/mL solvent) (A) PBS with NaOH to pH 10.0 (B), in Luria Bertani (LB) broth (C), ethanolamine (D), 1-butanol (E), ammonium bicarbonate buffer solution (50 mM), NaOH to pH 10.3 (F), N,N-dimethylacetamide (DMAc) (G), 1-ethyl-3-methylimidazolium acetate (EMIM-Ac) (H) and 40:60 EMIM-Ac:DMAc (I) before and after solubilisation for 3 days at 60 °C.

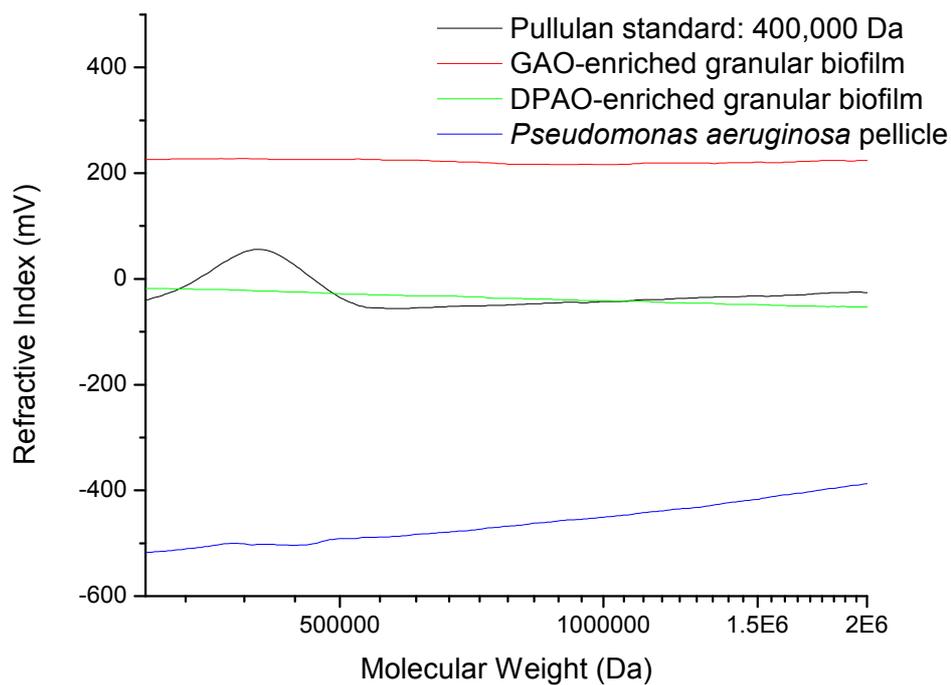


Fig. S4 MW distributions of all three biofilms in N,N-dimethylacetamide only (i.e. with no ionic liquid present) showing the complete absence of peaks corresponding to high MW compounds (i.e. $> 2 \times 10^5$ Da).

