

Supporting Information

Interaction between Engineered Pluronic Silica Nanoparticles and Bacterial Biofilms: Elucidating the Role of Nanoparticle Surface Chemistry and EPS Matrix

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- Representative TEM images and hydrodynamic diameter distributions of Plus-PEG and Plus-PEG-COOH NPs, high-magnification CLSM images of bacterial biofilms after exposure to Plus-PEG and Plus-PEG-COOH NPs and matrix components staining.

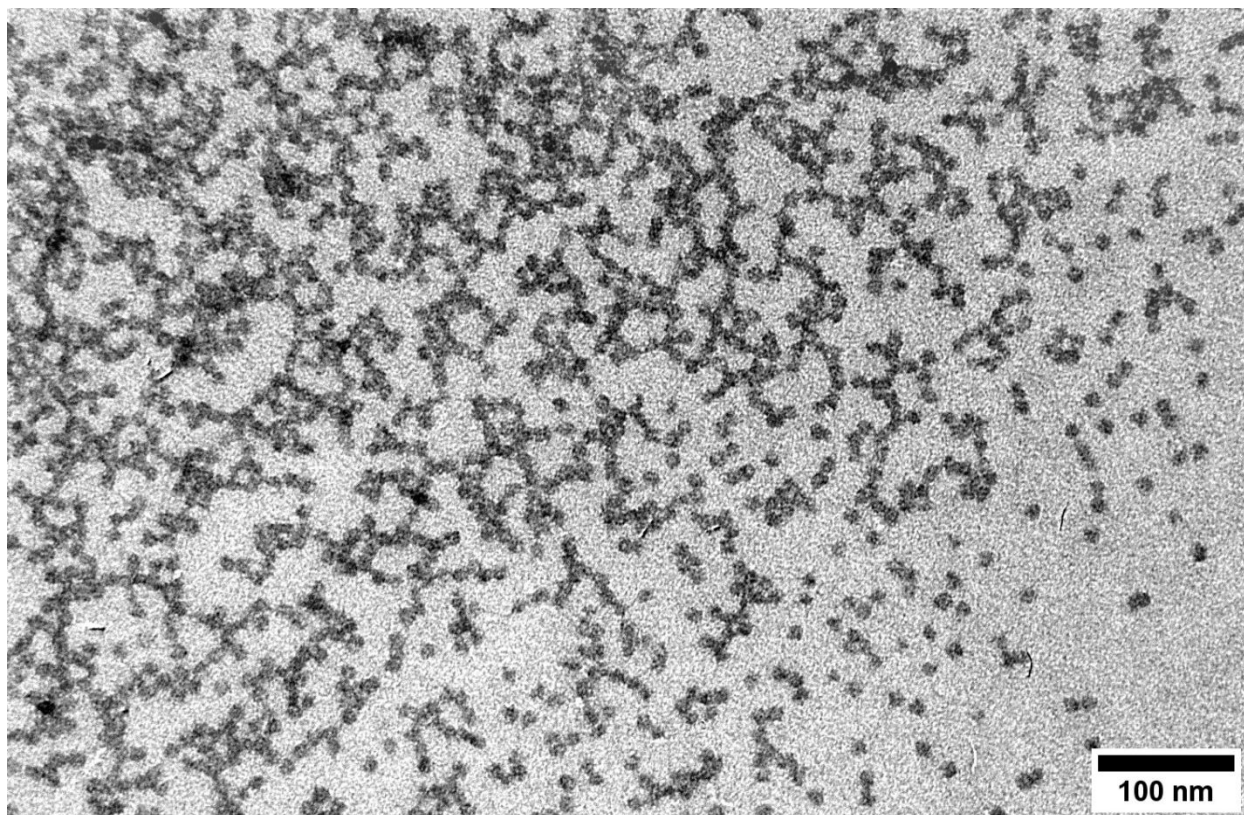


Figure S1. Representative TEM image of Plus-PEG nanoparticles ($d = (11 \pm 4)$ nm).

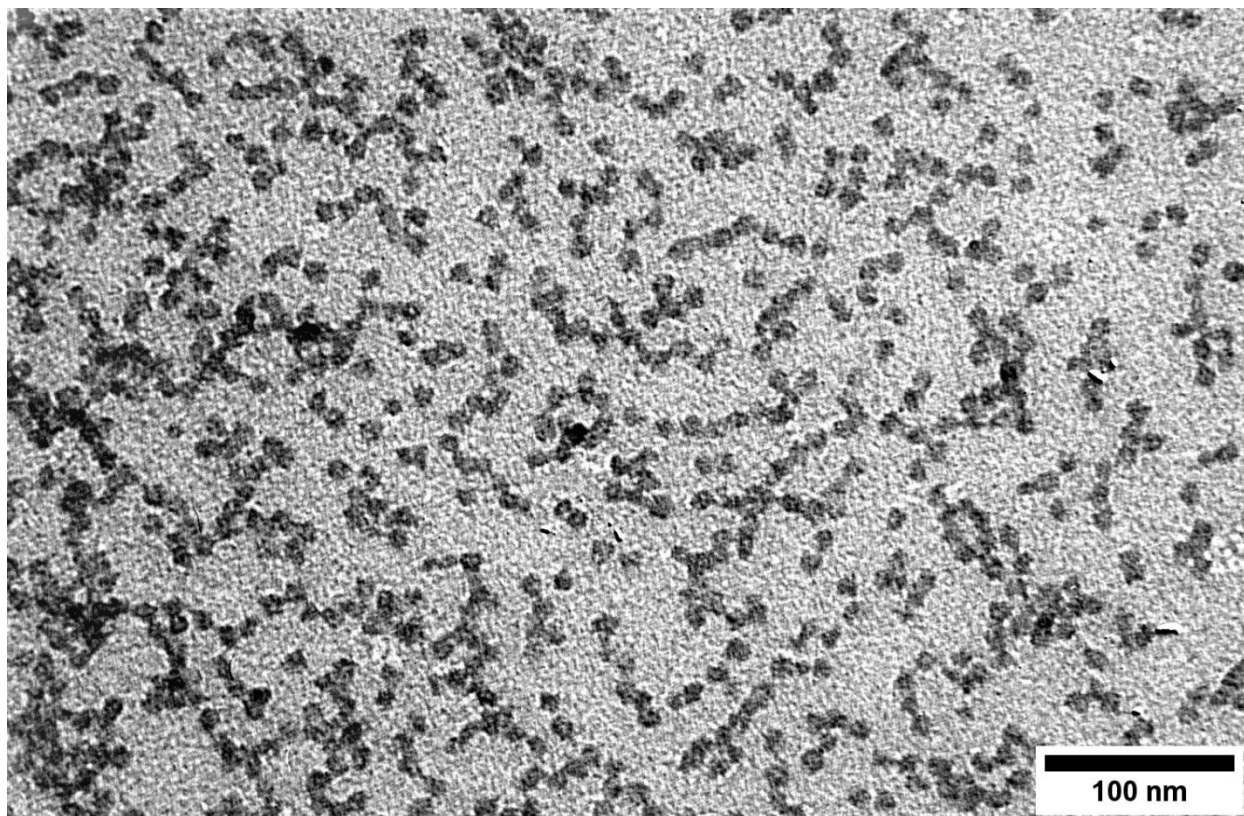


Figure S2. Representative TEM image of Plus-PEG-COOH nanoparticles ($d = (10 \pm 3)$ nm).

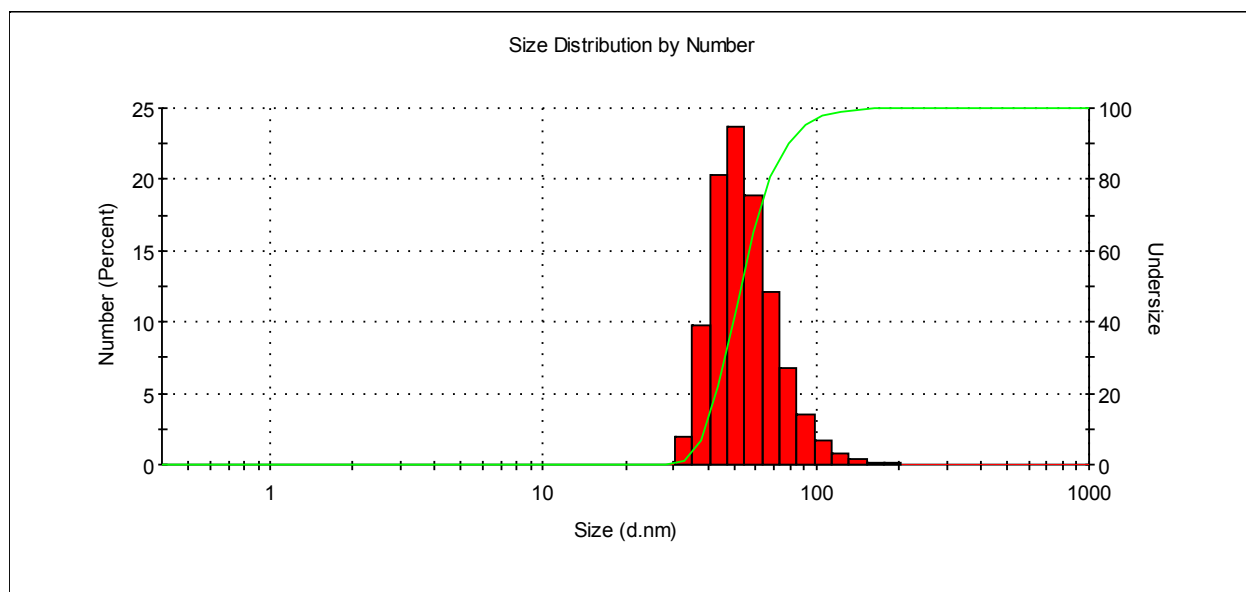


Figure S3. Representative hydrodynamic diameter distribution by number of Plus-PEG nanoparticles (water, 25°C, $dH = (45 \pm 1)$ nm, PDI = 0.20).

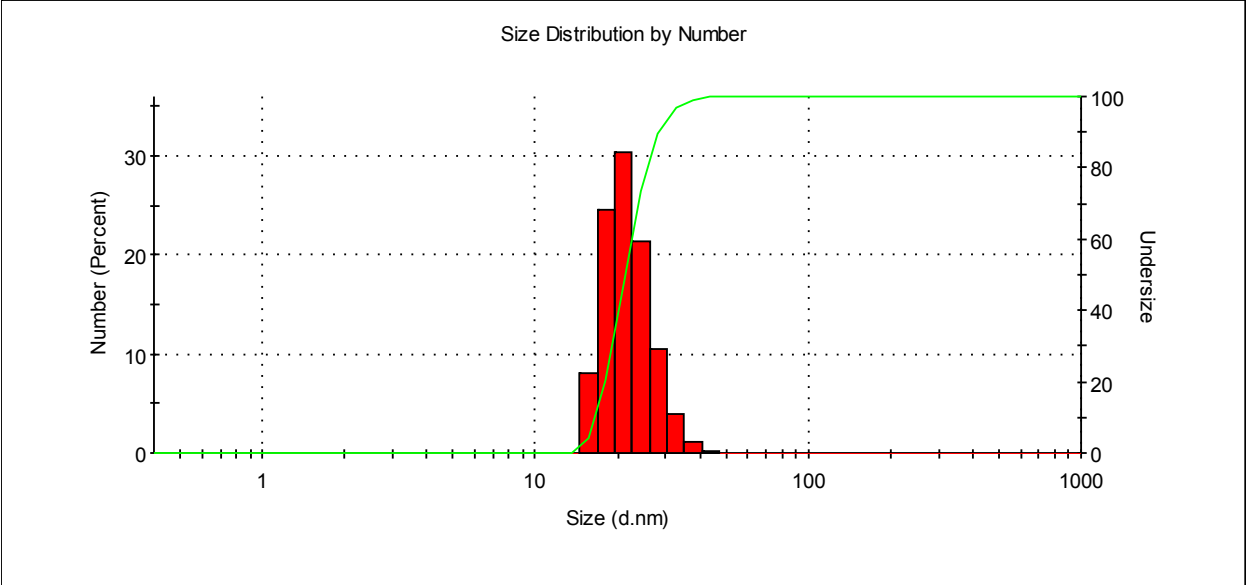


Figure S4. Representative hydrodynamic diameter distribution by number of Plus-PEG-COOH nanoparticles (water, 25°C, dH = (36 ± 3) nm, PDI = 0.38).

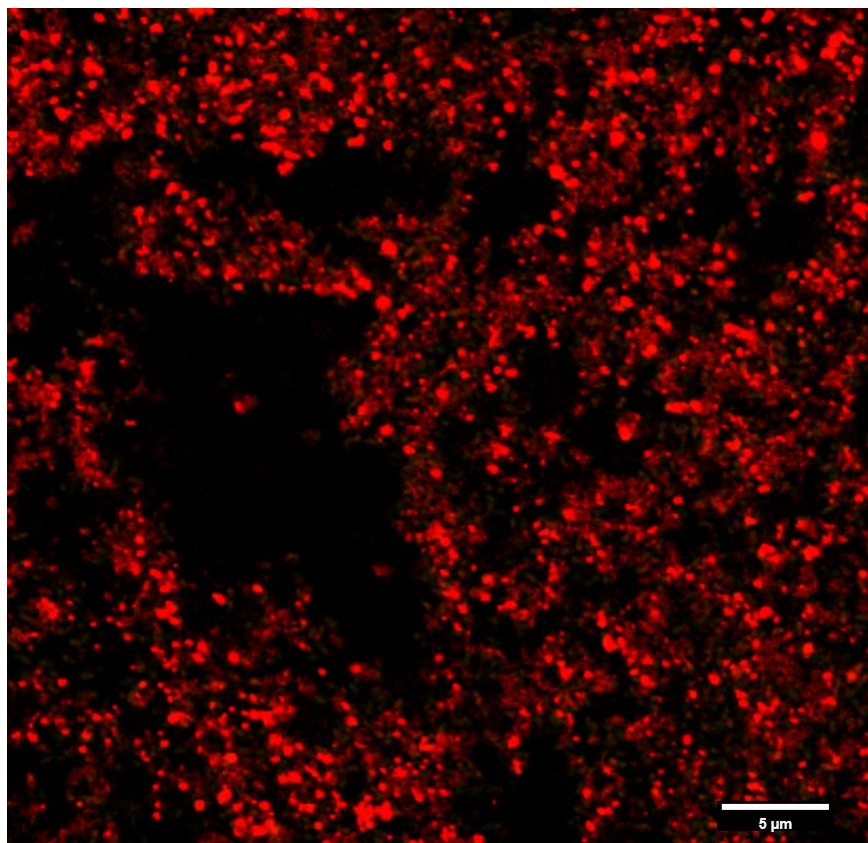


Figure S5. Representative high-magnification confocal image showing the distribution of Plus-PEG nanoparticles in *P. putida* PCL 1482 biofilm. Well-defined circular agglomerates of nanoparticles of $\sim 1 \mu\text{m}$ size can be observed evenly distributed. Scale bar is $5 \mu\text{m}$.

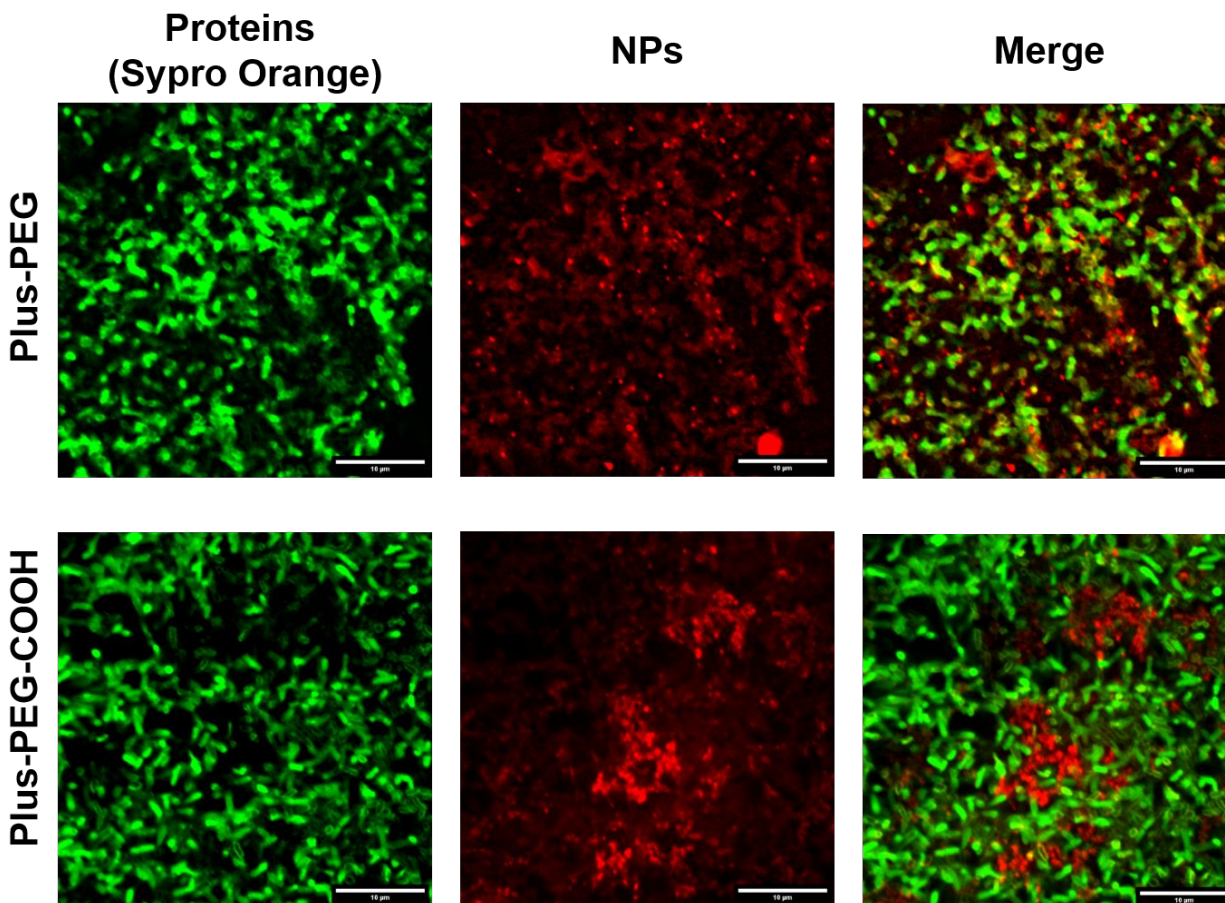


Figure S6. Representative single slice confocal images of *P. putida* PCL 1482 showing the localization and distribution of Plus-PEG (top) and Plus-PEG-COOH (bottom) relative to the proteins present in the biofilm, stained with Sypro Orange (green). Scale bars are 10 μm .

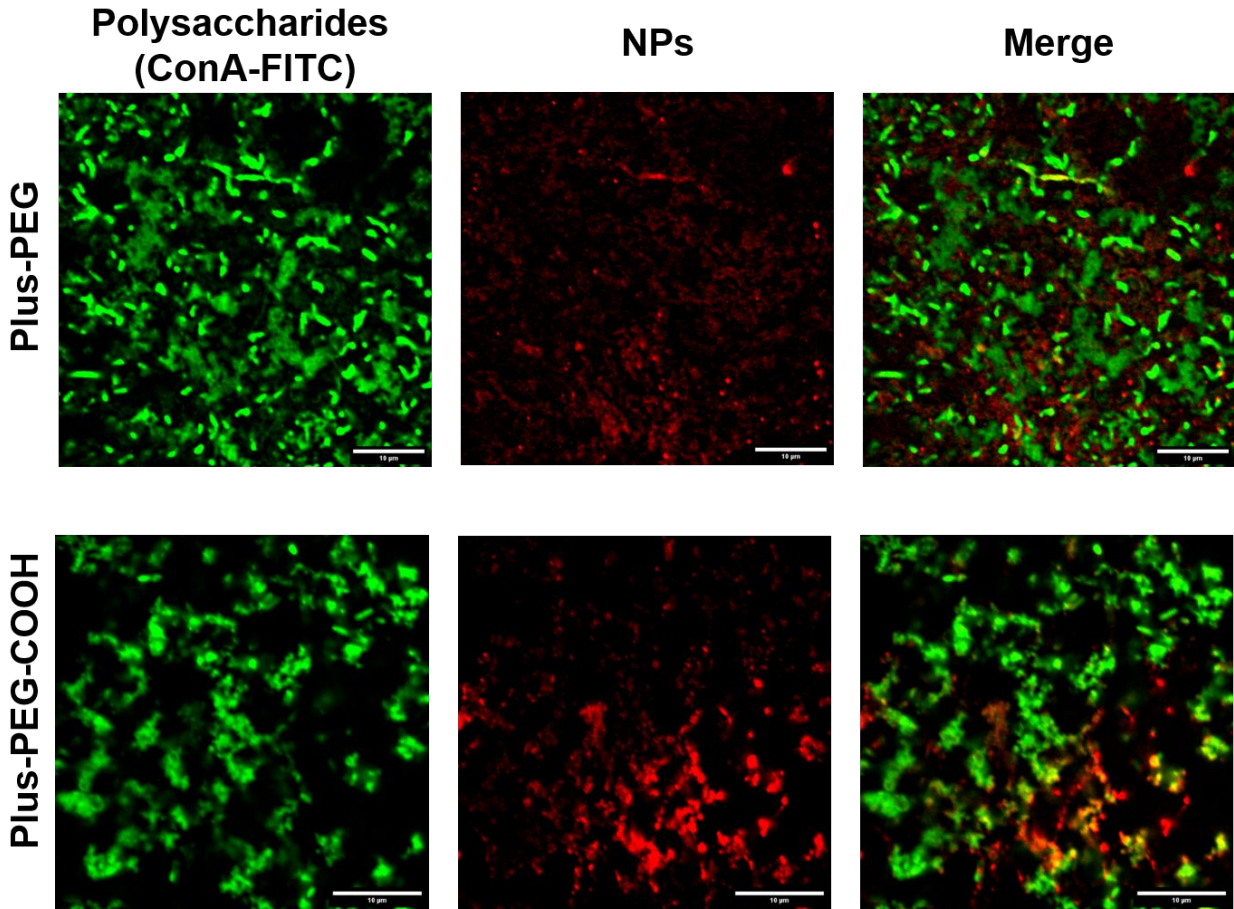


Figure S7. Representative single slice confocal images of *P. putida* PCL 1482 showing the localization and distribution of Plus-PEG (top) and Plus-PEG-COOH (bottom) particles relative to the polysaccharides present in the biofilm, stained with ConA-FITC (green). Scale bars are 10 μm .

Table S1. DLS and Zeta potential measurements for 200 nM dispersions of PluS NPs in either water and in 0.9% w/v NaCl.

Sample	200 nM water dispersion			200 nM in 0.9% w/v NaCl		
	d_H (nm)	PDI	Zeta potential (mV)	d_H (nm)	PDI	Zeta potential (mV)
PluS-PEG	45 (\pm 1)	0.20	-16 (\pm 1)	49 (\pm 7)	0.31	-2.6 (\pm 2)
PluS-PEG-COOH	36 (\pm 3)	0.38	-8 (\pm 2)	41 (\pm 2)	0.40	-3.8 (\pm 2)

d_H : hydrodynamic diameter; PDI: polydispersity index.