Supporting Information

Biomarker Imprinted Magnetic Core-Shell Nanoparticles for Rapid, Culture Free Detection of Pathogenic Bacteria

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Figure S1. *a)* Size distribution of different particles using DLS data: (i) iron oxide nanoparticles, (ii) silica coated magnetic nanoparticles, (iii) MPS-functionalized nanoparticles, (iv) MIP. All the particles were dispersed in filtered nanopore water. b) EDX analysis of different functioned particles to confirm the presence of chemical elements after each step of modification on surface. Refer a) for (i-iv) and (v) Non-imprinted polymer nanoparticles (NIPs). Color represents different elements: Si (green), O (red), Fe (blue) and C (yellow).



Figure S2. Zeta-potential for different particles in aqueous media



Figure S3. FTIR analysis of MIP-NPs made with different combinations of monomers and cross linkers as mentioned in Table S1.

Binding isotherm:

Binding of pyocyanin onto the polymer coated particles was examined using adsorption spectroscopy by measuring the concentration of pyocyanin. Different amount pyocyanin starting from 0 to 150 μ M was added into a fixed amount of MIP and NIP particles (in triplicates) and kept under slow rotation overnight. Finally, pyocyanin-bound particles were separated using a magnet and washed 2 times. The amount of pyocyanin was plotted against the concentration of pyocyanin used initially. The binding saturation comes around 49.6 μ M [pyocyanin] for MIP and 15.6 μ M for NIP. Binding capacity calculated as concentration of pyocyanin adsorbed from the test solution divided by initial concentration of pyocyanin in solution multiplied by 100%, is approximately 33.1% that is similar to that presented in Figure 5a. The amount of pyocyanin (mg) bound per g of particles was plotted and as depicted in Figure S4, a maximum of 5.34 mg pyocyanin can bind per g of MIP nanoparticles.



Figure S4: Amount of pyocyanin (mg) bound per g of MIP and NIP particles against the initial concentration of pyocyanin $(0, 25, 50, 100, 150 \mu M)$



Figure S5: Binding studies of non-specific templates with NIP particles.



Figure S6. Calibration curve for pyocyanin







Figure S8. Pyocyanin estimation in different cultures

PBS+MHB+PYO	500μL MHB+ 490μL PBS + 10μL Pyocyanin (Stock:5mg/mL)
PBS+FBS+PYO	970μL PBS+ 20μL FBS + 10μL Pyocyanin
PBS+PYO	990µL PBS + 10µL Pyocyanin