Supplemental Information

Improved source of drinking water: a source that provides 20 L of water per person per day within 10 km of the persons residence.

When in contact with a damaged cell membrane, propidium iodide becomes intercalated to the DNA of the cell[33 34]. In comparison, SYTO 9 indicates intact cell membranes. A stain solution of 1:1 (v/v0 was prepared by adding 12 μL of mixed stain solution to 12 mL of DI water. Suspension mixtures of challenge water, bacteria, and nAg were added to a 96-well flat bottomed black microplate to achieve the desired concentrations of 0 mg/L, 2.5 mg/L, 25 mg/L, 100 mg/L and 250 mg/L nAg, and 10^9 CFU/mL *E. coil.* The plate was then incubated at 25°C for 2 h, in a Biotek Synergy microplate reader, during which time it underwent horizontal shaking at increments of 0.25 h. After the 2 h incubation period, the plate was removed and the stain mixture was added by pipetting 100 μL into each well, and thoroughly mixing by pipetting each well ~10 times. 0.25 h of additional incubation was then required at room temperature before the microplate was read. Each condition was performed for each nAg (Maltose, Casein, and Rosemary) as well as a control. Each condition was performed in triplicate. The UDM (undisturbed cell membrane) (Eqn. 1) was quantified by utilizing the red/green fluorescence ratio between bacteria exposed to nAg, and the blank bacteria, at differing nAg concentration.

Phosphate Buffer Ingredients:

11.2 g/L K2HPO4

4.8 g/L KH2PO4

20 mg/L ethylenediamineetetraacetic acid

all sigma aldirch materials

pH: 7.3