Electronic Supplementary Material (ESI) for Analyst.

Effects of Surface Treatments on Trapping with DC Insulator-based Dielectrophoresis

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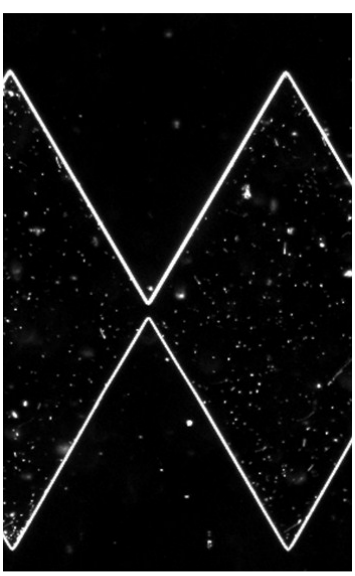
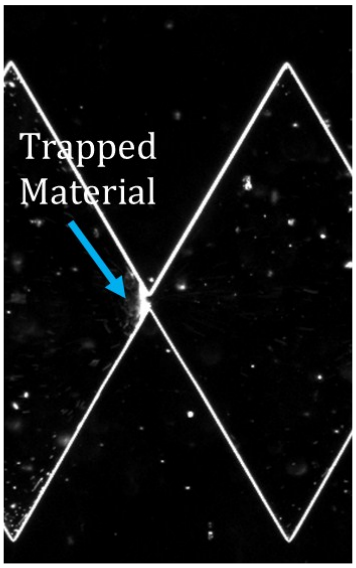
Demonstration of Dielectrophoretic Trapping of *E. coli*

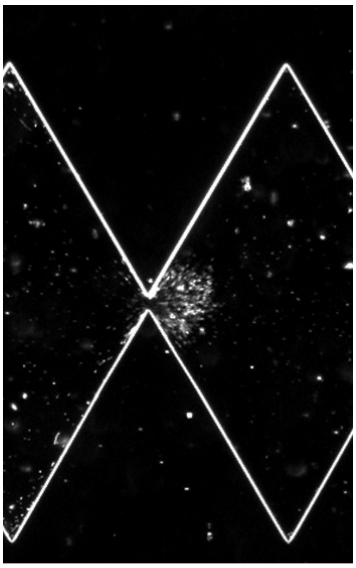
E. coli with a bovine serum albumin (BSA) surface modification in a microdevice with a global applied potential of -500V.



Prior to Voltage Application



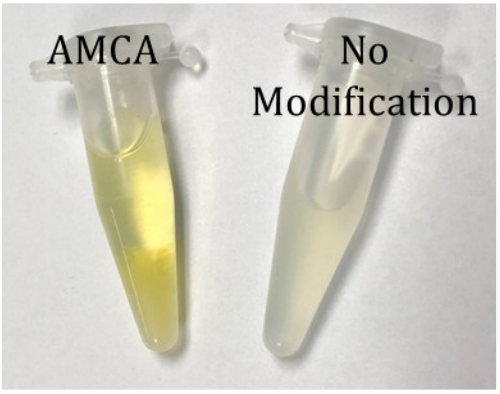
~15 seconds after the application of voltage

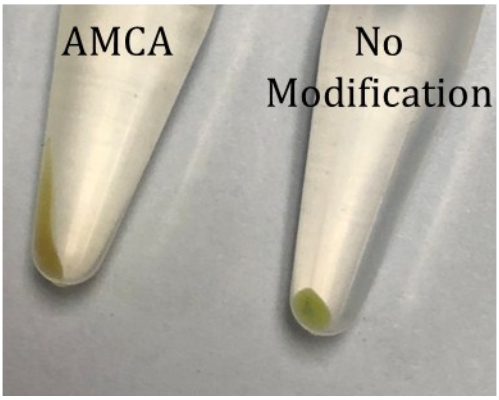


Release of trapped cells when voltage is removed

***E. coli* surface modification**

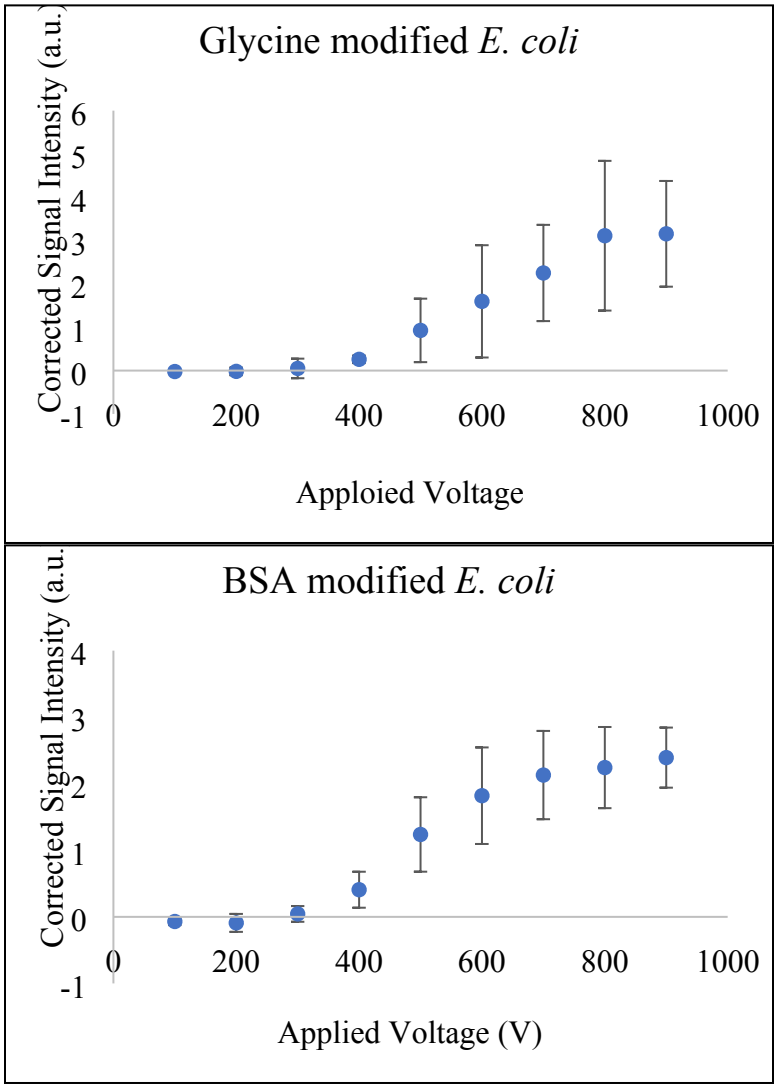
Visual demonstration of *E. coli* with no surface modification (right) versus cells labelled with 7-amino-4-methyl-3-coumarinylacetic acid (AMCA) (left) which only fluoresces when a covalent bond is formed. This first image is right after labelling and the second image is the pellet of cells after washing.

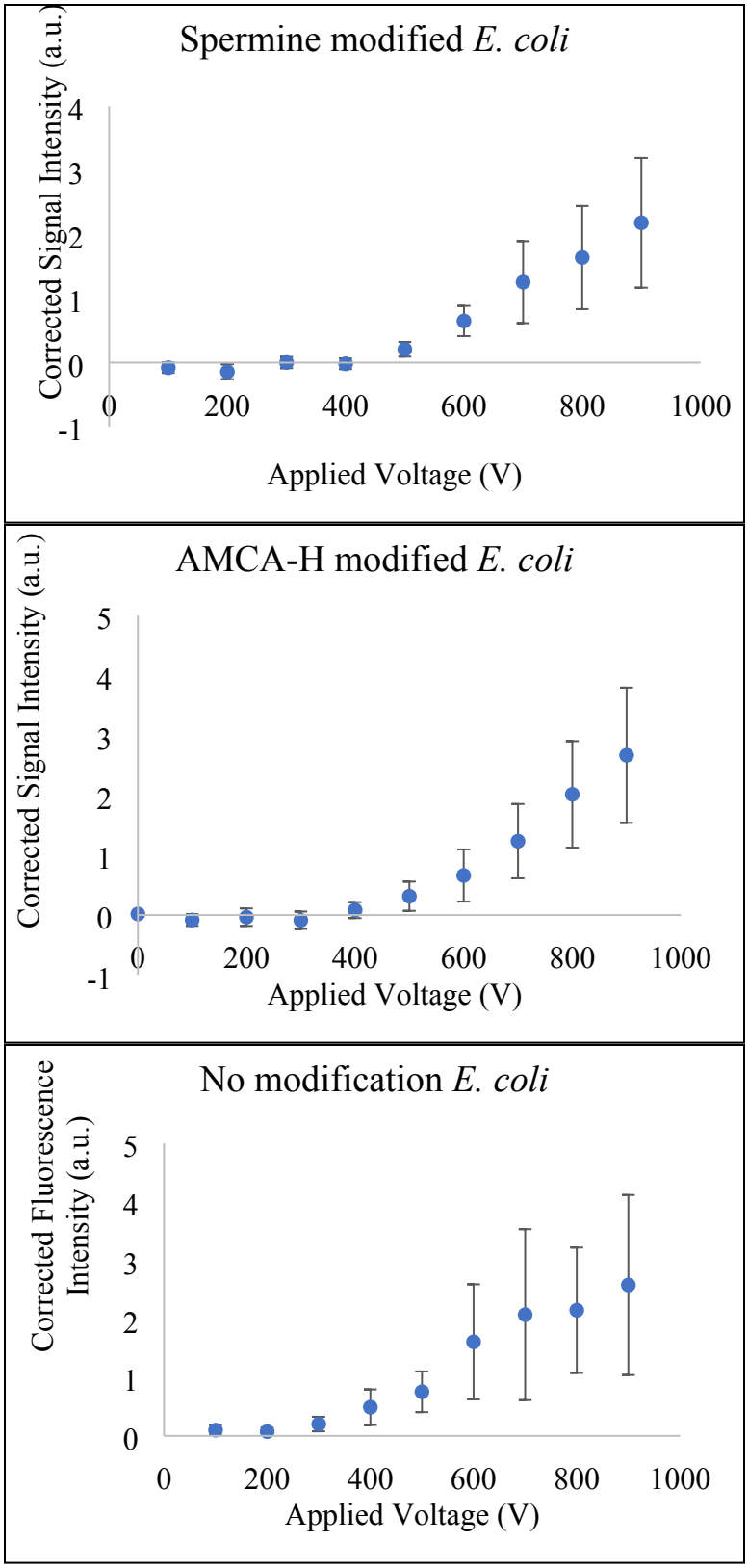




Preliminary Analysis of the Effect of Surface Modifications of the Dielectrophoretic Trapping of *E. coli*

Variations in the dielectrophoretic trapping of the various surface modifications are demonstrated based on the applied voltage where trapping of the bacteria is first detected. This can be seen by an increase in the fluorescence intensity. The collection of the bacteria has a linear phase based on the velocity of the bacteria in the microchannel. Both the initial voltage for trapping and the slope of the line for collection are representative of the biophysical properties of the cells.




Spermine modified E. coli
Corrected Signal Intensity (a.u.)
4
3
2
1
0
-1
0
200
400
600
800
1000
Applied Voltage (V)
AMCA-H modified E. coli
Corrected Signal Intensity (a.u.)
5
4
3
2
1
0
-1
0
200
400
600
800
1000
Applied Voltage (V)
No modification E. coli
Corrected Fluorescence Intensity (a.u.)
5
4
3
2
1
0
0
200
400
600
800
1000
Applied Voltage (V)