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Electrokinetically induced flocculation of Enteroaggregative *Escherichia coli* ALOKE KUMAR, NINELL MORTENSEN, Biosciences Division, Oak Ridge National Laboratory, Oak Ridge, TN 37831, MANSUETA HARRIS, Division of Natural Sciences and Mathematics, Morris College, Sumter, SC 29150, PARTHA MUKHERJEE, Computer Science and Mathematics Division, Oak Ridge National Laboratory, Oak Ridge, TN 37831, SCOTT RETTERER, MITCHEL DOKTYCZ, Biosciences Division, Oak Ridge National Laboratory, Oak Ridge, TN 37831 — Enteroaggregative *Escherichia coli* (EAEC) is a diarrheal microbe, whose aggregative dynamics is involved in its pathogenic behavior. We investigated EAEC's electrokinetic response in miniaturized and microfluidic devices. We found a novel response of the microbe under low magnitude, uniform and oscillating electric fields. In this electrokinetically induced response, microbial adhesion to a glass substrate decreases significantly, leading to a loss of EAEC's biofilm forming abilities. Some earlier studies had indicated that that microbial adhesion and detachment at surfaces can be prompted only by charge-transfer processes at the electrode and not applied electrical potentials - such an inference is not corroborated by our work. Instead, we found that electric fields promote the formation of large mesoscopic microbial aggregations (flocs) in the solution. The presence of frequency dependent relaxation phenomena is explored and the observed results are extended to other microbes.

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