

Abstract Submitted
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Simulating Sawtooth Mixers For Biofouling Mitigation JAMES WATERS, ANNA BALAZS, University of Pittsburgh — We demonstrate how a ridged surface can be used to generate vortices that will break up clusters of cells as they form. This offers an appealing avenue for fouling mitigation, as it relies on a physical mechanism without unintended environmental consequences. By adjusting the shape of these ridges, we can increase the effectiveness of the surface across a range of shear values. We represent such a system computationally using a hybrid of bulk fluid simulated via the lattice Boltzmann method, and deformable vesicles, representing cells, simulated via that lattice spring method. This simulation methodology allows us to rapidly implement and test different surface patterns, and explore how their parameters can most effectively deter the accumulation of biofilms.

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