

Abstract Submitted  
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**Motility-enhanced bioflocculation** MITUL LUHAR, Massachusetts Institute of Technology, ZHAOXUAN ZHANG, National University of Singapore, ROMAN STOCKER, Massachusetts Institute of Technology — Bacteria often rely on their ability to aggregate to survive in nature. They can form clusters among themselves or with suspended colloids, leading to biologically-enhanced flocculation (bioflocculation). We investigate the role of cell motility on bioflocculation by comparing two strains of *Escherichia coli*, a wild type and a non-motile mutant. We quantify settling rates from a suspension of bacteria and 1  $\mu\text{m}$  polystyrene beads, by independently varying the concentration of bacteria and colloids. We find that motility enhances settling rates up to 6-fold. We rationalize our findings in terms of an increase in encounter rates between bacteria and colloids. These results could contribute to improve the performance of wastewater treatment processes and provide a possible explanation for why motile bacteria are more successful biofilm formers.

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