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Shear flow influences the twitching motility of *Pseudomonas Aeruginosa* [1] YI SHEN, Princeton University, SIGOLENE LECUYER, Harvard University, ALBERT SIRYAPORN, ZEMER GITAI, HOWARD STONE, Princeton University — Twitching motility is one of the mechanisms by which bacteria can spread on surfaces and is important in the process of biofilm formation. Flow is often involved in biofilm formation, for instance when bacteria contaminate medical devices or water systems. We have studied the twitching mobility of *Pseudomonas aeruginosa* in straight microfluidic channels under laminar shear flow at low Reynolds number. We tracked all the bacteria adhering and moving on the immersed glass surface. We observed that upon applying a flow, a significant fraction of bacteria started to twitch, and that many twitched upstream, opposite to the flow direction. By measuring the displacement and residence time of the bacteria staying on the surface, we found that the flow not only tuned the direction of twitching by orienting bacteria, but also that the shear rate significantly influenced the fraction of bacteria moving upstream, with an optimal shear rate about 500s^{-1}.

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