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Motility behavior of *Vibrio natriegens* in micro-confined environments

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Vibrio natriegens, a gram-negative, polar flagellated, rod-shaped bacterium, is recently in the limelight as the organism with the shortest doubling time reported (9-10 minutes). It is being explored as an alternative workhorse in protein expression and genetic engineering to replace conventional hosts like *E. coli*. Our studies employing *V. natriegens* are performed to delineate its overall behaviour in microenvironments in general, and microfluidic channel devices in particular. Although the organism was reported several decades ago, a lot of its physical parameters like its motility behaviour in free solution and in constrained environments, its velocity, and the role of flagella in determining its velocity in closed environments, are largely unknown. *V. natriegens*, although belonging to the family of Vibrios, is a relatively slow runner compared to the other members of the genus like *V. comma*, *V. fischeri, V. harveyi* etc. In the preliminary study reported here, two different velocity modes were identified in *V. natriegens* as a function of growth phase. A lower velocity has been observed for late-stationary phases (compared to the exponential phase) of the *V. natriegens* culture, possibly due to the formation of lateral flagella – a characteristic growth in Vibrios. Apart from that, the behaviour of *V. natriegens* in structures with sharp corners/edges on different geometries like triangles, straight lines, curves and waves has been explored.

Biography

Ayyappasamy Sudalaiyadum Perumal has the degree of PhD in biology and health. He was a European Doctoral fellow supported and funded by Erasmus Mundus - Svaagata EU program. He worked on understanding the regulatory and molecular functioning of a transcriptional activator protein called RbpA (RNA polymerase binding protein A) during his PhD at CNRS, France. In December 2016, he started as a Post-doctoral researcher at Department of Bioengineering, McGill University, Canada. He pursues research in Biocomputation and studying the bacterial behaviors in micro-confined environments. The application areas include biocomputations, microbial preference to surfaces and geometries and anti-microbial surfaces.

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