

# Abstract

---

Motile bacteria using flagella-based movement are able to propel themselves in aqueous mediums and reach surfaces faster than their nonmotile counterparts. Bacterial motility affects not only the swimming behavior but also the attachment of cells due to the known role of flagella in the initiation of adhesion processes and indeed, could increase the occurrence of irreversible adhesion. Irreversible adhesion is an important step leading to the formation of biofilms which are challenging to destroy. Motile and nonmotile bacteria have often been studied in microbial adhesion processes in order to better understand attachment to biological surfaces as well as aiding understanding on biofilm formation. In this study, we examine not only the difference between motile and nonmotile bacteria in their adhesion process, but also the impact of the magnitude of swimming speed on the reversible and irreversible attachment behavior of mobile cells. To achieve this goal, we first need to incorporate swimming speed into the experiment by selecting the appropriate bacterial strains. Then, a microfluidic device is used under microscope to measure the attachment rates of these bacteria in a microfluidic channel under a controlled-flow environment.