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**Bacteria motility at oil-water interfaces** GABRIEL JUAREZ, STEVEN SMIRGA, VICENTE FERNANDEZ, ROMAN STOCKER, Massachusetts Institute of Technology — The swimming dynamics of bacteria are strongly influenced by interfaces: Motile bacteria often accumulate at rigid boundaries, such as liquid-solid interfaces, and at soft boundaries, such as liquid-air or liquid-liquid interfaces. Attachment of bacteria to these interfaces is crucial for the formation of biofilms (liquid-solid), pellicles (liquid-air), and oil-degrading communities (liquid-liquid). We investigated the motility of the oil-degrading bacteria *Marinobacter aquaeolei* in the presence of oil droplets. We created individual oil droplets using dedicated microfluidic devices and captured the swimming behavior of individual bacteria near the interface and their attachment dynamics to the droplets with high-speed and epifluorescent microscopy. We find that *Marinobacter aquaeolei* has a high affinity towards interfaces and their swimming dynamics at soft interfaces differ from both those in the bulk and at rigid boundaries. Characterizing the interaction and attachment of motile bacteria to liquid-liquid interfaces will promote a fundamental understanding to oil-microbe interactions in aquatic environments and potentially lead to improved oil bioremediation strategies.

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