The Department of Civil and Environmental Engineering at the University of Houston presents...

The CIVE 6111 Graduate Seminar Series

Shake it Off: Dynamics of Bacterial Adhesion at Interfaces

Dr. Jacinta Conrad
Frank M. Tiller Associate Professor of Chemical and Biomolecular Engineering
University of Houston

Friday, April 26, 2019
2:45PM-3:45PM
Classroom Business Building (CBB)
Room 118

Abstract
Control over adhesion of bacteria on solid and liquid interfaces underlies a spectrum of practical applications, ranging from preventing the formation of destructive biofilms on medical devices and on resource pipelines to removing pollutants from water. Because microscale bacteria are similar in size to colloidal particles, bacterial adhesion has long been studied using models for colloidal deposition. Many bacteria, however are active and can move, swim, tumble, and rotate near solid-liquid interfaces. This activity, not captured in models for deposition of passive colloids, must affect how bacteria deposit onto surfaces. Here, I will describe our recent work in which we explore the relationship between near-surface mobility and adhesion of bacteria to a variety of chemically-modified surfaces in a linear flow microchannel; engineer bacteria to identify surface structures that control transient mobility; and apply insights from the mobility studies to design responsive polymer brush surfaces that detach loosely adherent or mobile bacteria. I will then discuss our application of these methods to understand the dynamics of bacteria as they attach to oil/water interfaces.

Bio
Dr. Jacinta Conrad is the Frank M. Tiller Associate Professor of Chemical and Biomolecular Engineering at the University of Houston. Dr. Conrad's research interests include the transport of complex fluids (suspensions of polymers, colloids, nanoparticles, bacteria, bacteriophages, and/or proteins) near surfaces or in confined geometries that can influence behaviors such as adhesion, diffusion, and motility. Applications of her research include antifouling surfaces, biosensing, diagnostics, water remediation, and rapid prototyping.