BHE-026

Alteration of pathogenic bacterial adhesion on re-usable medical devices through bacterial surface property modification with ethylenediaminetetraacetate (EDTA)

Derick G. Brown
Assistant Professor, Department of Civil & Environmental Engineering,
Lehigh University

Yongsuk Hong
Graduate Student, Department of Civil & Environmental Engineering, Lehigh University

Jordan Ratcliff
Undergraduate Student, Bioengineering Program, Lehigh University

Industry Participants
Medrad, Inc.

Abstract

Biofilm formation on re-usable medical devices is a leading cause of hospital-acquired infection, often resulting in patient morbidity and mortality. Antibiotics are limited in their ability to reduce these infections due to the inherent protection offered to bacteria through the formation of biofilms, and as such, there is a strong research need to develop a means to prevent or minimize biofilm formation on medical devices. EDTA is a non-toxic agent widely used for its ability to form stable, water-soluble complexes with metals. It has been shown to affect bacterial colonization of surfaces, presumably due to complex formation with Ca^{2+} and concurrent destabilization of polysaccharides on the bacterial cell surface. In this work, we will evaluate the suitability of EDTA as a biofilm preventative for re-usable medical devices. The focus will be on the effects of EDTA on bacterial cell surface properties and adhesion of bacterial cells onto materials commonly used for re-usable medical devices.