Biofilms: Their Development and Prevention

George O'Toole
Professor, Microbiology and Immunology

CURRENT RESEARCH

Creating strategies to prevent and cure biofilm infections

We have all been exposed to biofilms in nature; in fact, life in a biofilm probably represents the predominant mode of growth for microbes in most environments. Recall a moment you had to step on a slimy rock in the bottom of a pond - or when you noticed plaque on your teeth, or when you had to clean the green stuff off the wall of your fish tank. These events all account for your encounters with biofilms, which are communities of microbes that attach to surfaces. Residing in natural, industrial, and medical settings, biofilms pose a menacing risk to human health - patients with medical implants, patients on ventilators, and people wearing contact lenses all are susceptible to biofilm infections, which are notorious for their resistance to a range of antimicrobial agents including clinically relevant antibiotics. Dr. George O'Toole, of the Geisel School of Medicine at Dartmouth, aims to understand how biofilms form on both living (airway cells) and non-living (medical implant) surfaces, and what roles biofilms play in host-pathogen interactions and resistance to antibiotic therapy.

Dr. George O'Toole's research in biofilms has critical applications in the medical setting. For example, any medical implant that goes into the human body - a contact lens, a catheter, or an artificial joint - is potentially a surface on which biofilms can form. Because biofilms are very difficult to treat with antibiotics, if a medical implant gets infected, the only option is to remove the implant which can be incredibly devastating for the patient and extremely costly. Another common example of biofilms in a medical setting is otitis media, or earache. Otitis media is a bacterial biofilm forming in the ear, especially in...

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AFFILIATION

Dartmouth College

EDUCATION

- B.S., in Cell Biology, 1988

Cornell University

- Ph.D., in Microbiology, 1994

University of Wisconsin-Madison

AWARDS

- NIH MERIT Award, 2014
- MBL Summer Research Fellowship, 2012
- Ionic Pharmaceuticals, co-Founder, 2012
- Fellow, American Academy for the Advancement of Science (AAAS), 2011
- Fellow of the American Academy of Microbiology, 2010
- and 1 more...

RESEARCH AREAS

Life Science, Immunology / Inflammatory, Pediatric

FUNDING REQUEST

Your contributions will support the continued research of Dr. George O'Toole at Dartmouth as he resolves to understand how to better tackle polymicrobial biofilms. Your donations will help cover the annual $500K required for costs of equipment/supplies and to support personnel who are developing new strategies to treat biofilm infections that target both children and adults. By donating, you will help accelerate the medical breakthroughs that will facilitate biofilm prevention and treatment processes.