Creating a Hostile Home for Harmful Bacteria

Dacheng Ren
Associate Professor, Biomedical and Chemical Engineering

CURRENT RESEARCH

Targeting biofilms to fight infection

In the US alone, biofilms are blamed for billions of dollars in losses and more than 90,000 deaths annually. Despite the well-recognized significance of biofilms, biofilm control is still an unmet challenge and many fundamental questions are yet to be answered. Dr. Dacheng Ren, Associate Professor of Biomedical and Chemical Engineering at Syracuse University, develops biotechnology that targets drug resistance and infections caused by biofilms. With the efficacy of antibiotics and disinfectants being intrinsically limited, new approaches, especially those with synergistic effects, are desired. Therefore, Dr. Ren's research is likely to have a profound impact on the health and wellness of those impacted by drug resistant infections.

Furthermore, biofilms are 1000 times more tolerant to antibiotics and disinfectants compared to their planktonic counterparts. Therefore, deleterious biofilms can cause not only serious problems such as chronic infections in humans, but also problems in persistent fouling and equipment failure within industry. In Dr. Ren's lab, his multidisciplinary research group hopes to enhance engineering knowledge and address biofilm-associated grand challenges for medical and engineering applications. Their expertise and pioneering work have led to the development of new approaches to sensitize biofilm cells and other drug tolerant bacterial cells to antibiotics, as described in many peer reviewed publications and issued patents.

Current research includes:

- Anti-biofilm materials/surfaces: Reflect on the ways in which humans choose to live in a certain neighborhood or city; perhaps safety, comfort, or like-minded community members are important. Bacteria...

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AFFILIATION

Syracuse University

EDUCATION

- Ph.D., Chemical Engineering, 2003 , University of Connecticut

AWARDS

- Syracuse University LCS Faculty Excellence Award, 2014
- NSF CAREER Award, 2011-2016
- College Technology Educator of the Year by the Technology Alliance of Central New York (TACNY), 2010
- Early Career Translational Research Awards in Biomedical Engineering, Wallace H. Coulter Foundation, 2009

RESEARCH AREAS

Life Science, Infectious

FUNDING REQUEST

Your contributions will support the continued research of Dr. Dacheng Ren at Syracuse University, as he studies Biofilm Engineering. Funding will support the necessary $400K/year required for continued research, personnel, and equipment. In choosing to support his research, you will expand the impact of his research and enhance engineering knowledge to address biofilm-associated grand challenges for medical and engineering applications.