



Biofilms are biological films that develop and persist at interfaces in aqueous environments. These biological films are composed of cells immobilized at a surface that may be embedded in an organic polymer matrix of microbial origin.

Biofilm cells differ from their planktonic counterparts in the genes and proteins they express, resulting in distinct phenotypes that include altered resistance to biocides, antibiotics and the human immune system. Bacterial biofilms have been implicated in more than 80 percent of chronic inflammatory and infectious diseases, including ear infections, native valve endocarditis, urinary tract infections, burn and non-healing wounds and infections of indwelling medical devices. Biofilms are also the principal cause of biofouling, a persistent problem in marine and industrial environments. Biofouling affects food processing, water purification and distribution, the pharmaceutical and petroleum industries, as well as essentially all other industries having materials exposed to water.

PARTNERS

Opportunities exist for collaborative and interdisciplinary research. The group can act as a critical research component to link university research to innovation and problem solving with industrial partners.

TRAINING

The Biofilm Research Group provides opportunities for short-term and long-term training in biofilm research and testing methods for visiting researchers and technical staff, allowing for the transfer of the latest methods and approaches for testing and performing research with biofilms.

TESTING AND DEVELOPMENT

The Biofilm Research Group performs tests on the effects of novel compounds and treatments for biofilm control, biofilm removal and biofilm prevention. These include antimicrobial testing, microbial attachment, biofilm development and biofilm dispersion assays. In the past, the group has been involved in developing improved methods for biofilm removal from medical and industrial surfaces.

CONSULTING

The Biofilm Research Group provides consulting services to companies and research laboratories for the development of novel strategies for the treatment and control of biofilms in industrial, medical and household settings. The team has worked with several Fortune 500 companies.

For more information visit:

go.binghamton.edu/biofilms

The Biofilm Research Group is an internationally recognized team of microbiologists specializing in biofilm research. The group is comprised of Ph.D. scientists, staff and post-doctoral researchers, as well as graduate and undergraduate student researchers. The group is housed in a modern, 4,500-square-foot laboratory.

The Biofilm Research Group focuses on biofilm research, including resistance to antimicrobial agents, biofilm dispersion and regulation of biofilm development. The Biofilm Research Group has expertise in pure and applied research on microbial biofilms.

The team has made significant contributions to our understanding of biofilm development and regulation. Their findings have been published in peer-reviewed journals in the field of biofilm research and their biofilm testing methods are widely used.

STAFF AND FACILITIES

David G. Davies, associate professor, focuses on the study of the regulation of biofilm development and the physiology of biofilm bacteria. His work has included studies on the regulation of initial events in biofilm formation, the regulation of biofilm matrix polymer formation and the regulation of biofilm dispersion. Recent work includes the discovery of a novel biofilm dispersion signal molecule, a fatty acid responsible for inducing biofilm dispersion in bacteria and fungi.

Karin Sauer, associate professor, focuses on the characterization of biofilm development and biofilm antimicrobial resistance using proteomics and genomic approaches. In particular, her research focuses on elucidating the regulation of biofilm developmental aspects, which has recently resulted in the identification of key regulators required for biofilm formation/development and biofilm antibiotic resistance.

Cláudia N. H. Marques, assistant professor, focuses on biofilm resistance and the impact of biofilms on the environment and human health. She is involved in the study of persisters, biofilm prevention and dispersion. She has experience in the study of oral microbiology, skin microbiology and in vivo virulence.