Yousif Shamoo, PhD
Vice Provost for Research

Microfluidic Technology to Study Bacterial Evolution to Antibiotics

Yousif Shamoo, Ph.D., has served as the Vice Provost for Research at Rice University since 2014. He was appointed Professor of BioSciences in 2012, and first joined the Rice University faculty in 1998. He received his Ph.D. degree in Molecular Biophysics and Biochemistry from Yale University in 1988.

Dr. Shamoo's research lab studies the dangerous rise of multi-drug resistant bacteria. With multi-drug resistant bacteria becoming increasingly common in hospitals, antibiotic resistance has threatened to return us to a pre-antibiotic era that would completely undermine modern medicine. His work seeks to elucidate the underlying biophysical principles of adaptation within bacterial populations during adaptive evolution. His group uses a combination of experimental evolution, biochemistry, molecular biophysics and genomics to link changes in protein structure and function to their resulting phenotypes within evolving populations. They go on to extend these physicochemical principles to predict the success or failure of specific adaptive alleles undergoing antibiotic selection. The identified evolutionary trajectories to antibiotic resistance serve as rich sources of insight for biomarker discovery as well as understanding the mechanisms of resistance in pathogens.