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Abstract

“Role of an RNA Chaperon (Hfq) in *Acinetobacter baumannii* pathogenesis”

*Acinetobacter baumannii*, a gram-negative opportunistic pathogen, is becoming an important nosocomial agent causing a wide range of diseases and infections including ventilator-associated pneumonia, septicemia and urinary tract infections. The pathogen has emerged as one of the most highly antibiotic resistant in the US and elsewhere. Nearly, 70% of *A. baumannii* clinical isolates are now resistant to all drugs except colistin or tigecycline (known as extremely drug resistant or XDR). Furthermore, infections caused by *A. baumannii* that are resistant to all available antibiotics (known as pan-drug resistant or PDR) have already emerged and continue to increase since no new drug is in the pipeline that targets *A. baumannii*. The traditional antibiotics that target cell viability and growth perhaps are not the answer since they will drive the appearance of XDR or PDR further. The innovative approach would be the development of drugs that target the bacterial pathogenesis by inhibiting or controlling expressing of virulence factors. Hfq is a pleiotropic virulence regulator found in many pathogenic bacteria. It is a conserved protein that functions as a post-transcriptional regulator and displays RNA chaperone activity. Inactivation of *hfq* makes the cells sensitive to various environmental stresses, such as oxidative stress, displaying enhanced susceptibility to various antibiotics, and alteration of the synthesis of several proteins. Furthermore, pathogens lacking a functional Hfq protein are generally attenuated for virulence. Therefore, Hfq is an ideal target for drug development to control a wide range of pathogens including *A. baumannii*. This presentation will discuss some of important roles of Hfq in *A. baumannii* pathogenesis.
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Bio-Summary

Dr. Indranil Biswas received his BSc (Ag) Hons degree from BCKV University, India and MSc degree in biotechnology from Madurai Kamaraj University, India. He received his PhD in microbiology from University Paris VII, France. After completing his graduate studies, he joined National Institutes of Health (NIH) in Bethesda, Maryland for his post-doctoral training. In 1998 he joined National Centre for Cell Science, Pune, India as a senior scientist but left the position in 2000 to join the faculty at Emory University. He then moved to University of South Dakota in 2003. Currently, he is a professor in the Department of Microbiology at the University of Kansas Medical Center. His main research interest is in the areas of bacterial pathogenesis and bacterial antibiotic resistance. He has over 60 peer reviewed research articles, reviews and book chapters. He serves as editor of three international journals including PLoS and Scientific Reports as editorial board member of many international journals including ASM journals (J. Bacteriology and mBio), and also serves as reviewer in many NIH Study Sections. He is a member of F1000 faculty and is a former Fulbright scholar. His current research program is supported by NIH and other agencies.

Recently, Dr. Biswas’s lab initiated research on Acinetobacter baumannii, an emerging nosocomial pathogen involved in a variety of infections ranging from soft-tissue infections to more severe infections such as pneumonia and bacteremia. A. baumannii has the ability to acquire an antibiotic resistance cassettes from the environment and this trait has allowed the organism to persist in healthcare settings and has facilitated the global emergence of multidrug resistance (MDR). A. baumannii also has the remarkable ability to survive on various types of abiotic surfaces including medical devices and to survive prolonged periods under highly desiccated conditions on dry surfaces, a phenomenon that is not commonly found with other Gram-negative pathogens. Primary focus of the lab is to study the antibiotic resistance and desiccation tolerance mechanisms of A. baumannii.