

STATEMENT OF RESEARCH INTERESTS AND ACCOMPLISHMENTS

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9 June 2005

Throughout my nearly 20 year career I have focused my research on understanding the molecular mechanisms underlying bacterial pathogenesis. In particular, I have maintained a longstanding interest in the extremely important human bacterial pathogen *Streptococcus pneumoniae* (the pneumococcus). My colleagues and I have carried out a number of investigations of both pneumococcal pathogenesis [1-8] and host responsiveness to infection [9-22] by this species. Most recently, I have collaborated very closely with Dr. David Niesel in the Department of Microbiology & Immunology at the University of Texas Medical Branch in Galveston. We are examining alterations in global patterns of gene transcription and subsequent protein expression in *S. pneumoniae* in response to changes in the ambient environment (including: in vivo growth; phosphate limitation; shear stress; and alteration of growth temperature) [23, 24]. To accomplish this, we are now using whole genome micro-arrays we have obtained (as an in-kind grant of resources) from the Pathogen Functional Genomics Resource Center (a joint project of NIAID and TIGR), as well as a variety of means to assess protein expression. Our data indicate that environmentally-mediated signaling leads to global changes in patterns of gene expression in the pneumococcus, thereby potentially identifying new targets for therapeutic intervention in the disease process [25, 26].

I have also been interested in improving graduate student presentation skills. I have assessed whether their skills have improved as a function of giving multiple presentations and having received both peer and faculty feedback after each. The data I collected clearly demonstrate that they do [27].

Last, I have endeavored to analyze factors associated with external validation of research by the scientific community via citation of peer-reviewed publications. I have evaluated the rapidity and magnitude of citation of innovative techniques [28], as well as quality, productivity, and citedness of individual investigators as a function of experience level [29].

References:

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