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Pathogenesis of bovine intramammary infections: Lessons learned from the pathogen and host cell interactions

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Bovine mastitis, an inflammation of the udder that affects a high proportion of dairy cows throughout the world, has been described as the most important disease affecting the dairy industry. Bovine mastitis is largely caused by bacterial pathogens that have been classified as contagious (cow-to-cow infections) or environmental (environment-to-cow infections). Due to the diversity of the cow's housing and dairy herd managements, mastitis pathogens present in the cow's environment are very difficult to control. Among these, *Streptococcus uberis* is the most prevalent. In spite of the increasing knowledge about its pathogenesis, the control of this pathogen is very difficult due to its ability to adapt, evade host's defense mechanisms, and establish persistent infections. Research conducted in our lab lead to the identification of several *S. uberis* pathogenic strategies; this pathogen is able to bind host factors present in milk, and through it attach and internalize into host cells triggering their own "uptake" signal by host cells. Once inside of the host cell, *S. uberis* not only avoids phagocytic cells and microbicidal factors present in milk, but also circumvent intracellular microbicidal mechanisms (i.e., endosome acidification; phagolysosome fusion) by exploiting preferential intracellular trafficking pathways. Recent research conducted in our lab lead to the identification of novel virulence factors and results demonstrate that these factors play a critical role in the pathogenesis of *S. uberis* mastitis thus becoming a promising vaccine candidate for the prevention of an economically important disease in dairy cows. In this communication, we will present an overview of our findings.

Biography

Raul A. Almeida has earned his DVM from University of Littoral, Argentina, and completed his Ph.D. in Veterinary Microbiology from Iowa State University Veterinary College. He currently is the director of The University of Tennessee Quality Milk Laboratory. He has published more than 50 papers in reputed journals, has 10 patents, and obtained several grants on *S. uberis* virulence factors. He has presented results from his research team in many national and international meetings and his expertise on the pathogenesis of environmental mastitis pathogens has been internationally recognized.

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