Sperandio Lab

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I got my Ph.D. in 1995 in the State University of Campinas in Brazil, and finished my post-doctoral training in 2001 at the University of Maryland Medical School of Medicine, when I joined the faculty at the Microbiology Department at UT Southwestern. I was promoted to Associate Professor with tenure in 2007 and joined the faculty of the Biochemistry department as a secondary faculty member in 2008. In 2011 I was promoted to Full Professor with tenure.

Research in my laboratory investigates chemical, stress and nutritional signaling at the interface amongst the mammalian host, beneficial microbiota and invading pathogens. We devise a multi-disciplinary research program utilizing genetic, biochemical, chemical and structural approaches to investigate fundamental biological questions. The main tenant of research in my laboratory are the study of how bacterial cells sense several mammalian hormones as a means to gage the physiological and immune state of the host, leading to rewiring and reprogramming of bacterial transcription towards host and niche adaptation. We have also identified the first bacterial receptors to mammalian hormones, and reported that invading pathogens hijack these inter-kingdom signaling systems to promote virulence expression. We then translated these basic science concepts into strategies to develop novel approaches to anti-microbial therapy. This is a first-in-class anti-virulence approach that targets a bacterial receptor, QseC, to the host epinephrine and norepinephrine hormones that is key to activate virulence in many Gram-negative pathogens. We developed small molecule inhibitors of QseC that are effective in treating and preventing bacterially-mediated disease against several Gram-negative pathogens during mammalian infection. A key point to this therapy is that it is unlikely to lead the development of drug-resistance given that it halts bacterial virulence, but does not interfere with bacterial growth.

I am a Professor in the Departments of Microbiology and Biochemistry at UT Southwestern. I was a Pew Fellow in Biomedical Sciences (1997), an Ellison Foundation New Scholar (2004), a Burroughs Wellcome Fund Investigator in the Pathogenesis of Infectious Diseases (2006), and Kavli Frontiers of Science Fellow (2007). In 2013 I was elected a fellow of the American Academy of Microbiology. My laboratory explores chemical communication through signaling mechanisms and nutritional cues among the mammalian host, the microbiota and invading pathogens. We investigate the basic science questions related to these interactions and translate this knowledge into new anti-microbial therapies.