David Pride

Associate Professor of Pathology at UC San Diego

San Diego, CA, US

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Biography

Our laboratory focuses on the role that microbial communities play in human homeostasis, health and disease. We firmly believe that the various microbial components of human ecosystems including bacteria, viruses, archaea, and fungi are important factors that help determine the natural history of their hosts. Furthermore, their interactions with humans or their interactions with other microbial constituents in these communities likely have consequences for human health. Our primary focus is on the role of human viral communities, particularly in the oral cavity. We have demonstrated that there are robust communities of viruses present in the human oral cavity, most of which are viruses of bacteria. These viruses likely play a unique role in pathogenesis within the community, as a large proportion of these viruses are involved in lysogeny and bring new gene function into the community that may be utilized by their bacterial hosts. We are actively pursuing the role that RNA and DNA viruses play in these communities in terms of contributing pathogenic potential, as well as their effect on their host bacterial communities. Because of our interest in infectious diseases in humans, we study these communities almost exclusively in humans in health and disease. A secondary focus of the laboratory is to explore the interactions between viruses and their bacterial hosts through examination of bacterial adaptive immune systems called CRISPRs. We provided the first metagenomic analysis of CRISPRs in human ecosystems, and have demonstrated that Streptococcal species in the human oral cavity are actively adapting immunity to viruses they encounter on a daily basis. We are continuing to pursue characteristics of CRISPRs in human ecosystems, using CRISPRs to trace individual human subjects in both health and disease, to explore the robustness of the immune responses of bacteria against certain viruses, and to track individual bacteria as they may fluctuate in the community. Another field of interest in the laboratory is to explore the contribution of microbes to metabolism and pathogenesis in human ecosystems. We are particularly interested in human diseases such as periodontitis, which may have polymicrobial etiology.

Areas of Expertise

Coronavirus, COVID-19 Testing, Pathology, Infectious Disease, COVID-19, Drug and Vaccine Development

Affiliations

Board Certified American Board of Medical Microbiology: 2014 to present, Board Certified Infectious Disease: 2008 to present, Board Certified Internal Medicine: 2006 to present

Education

New York University
M.D. Medicine

Vanderbilt University
Ph.D. Microbiology and Immunology

Vanderbilt University
B.S. Biology
