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Competition between invading pathogens and resident respiratory tract microbiota

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Although respiratory pathogens are a leading cause of death worldwide, we know very little about how invading bacterial pathogens directly overcome resident microbiota to colonize a host. Recently, we observed displacement of both culturable and unculturable bacteria from the upper respiratory tract upon murine infection with a common murine respiratory pathogen, *Bordetella bronchiseptica*. We examine the mechanistic basis for *B. bronchiseptica* displacement of other respiratory microbiota during infection. In parallel, we have demonstrated that resident microorganisms can prevent *B. pertussis* colonization and influence (apparent) host specificity, and provide rationale for manipulating microbiomes to create more-accurate animal models of infectious diseases. These results reveal complex intra-host competition between invading pathogen and resident microbiota and demonstrate novel effects of bacterial secretion systems and host immune functions in this *in vivo* competition. They also provide a striking example of displacement of chronic colonizers of the mammalian respiratory tract, potentially revealing novel pathways to disrupt the carrier state of a variety of common opportunistic respiratory pathogens.

Biography

Eric T Harvill completed his PhD in Immunology in 1996 from UCLA and postdoctoral studies in Microbial Pathogenesis with Jeffry F. Miller. He has served the National Academies, NIH, USDA, DOD and other agencies in a variety of capacities and has served on many review panels and editorial boards. He is currently Professor of Microbiology and Infectious Disease at Penn State and Visiting Professor in the Singapore Centre on Environmental Life Sciences Engineering (SCELSE) at Lee Kong Chian Medicine and Nanyang Technologica University. He has published over 80 peer-reviewed articles in a wide variety of journals.

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