Microbe-host interactions in human diseases and their modeling in experimental animals

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The exploration of microbial roles in human diseases is paramount for a comprehensive understanding of infection mechanisms, pathogenesis, and host immune responses. Microorganisms, including bacteria, viruses, fungi, and parasites, play pivotal roles in initiating and advancing a wide spectrum of diseases, and are also crucial for maintaining health, particularly in relation to inflammatory processes. This complex interplay between microorganisms and their hosts necessitates sophisticated experimental animal models to unravel the intricacies of these interactions. This abstract outlines the main topics of my presentation, reflecting on our research team's efforts in this field, both past and present. We initially examine the impact of environmental exposures on microbe-host interactions, focusing on allergic diseases. Subsequently, we explore how these interactions contribute to inflammatory skin conditions. Additionally, the presentation addresses the challenges of using experimental animal models to study the microbiome's role in human diseases. Improvements in animal models, coupled with advances in technology, offer valuable opportunities to decipher the complex relationships between humans and their microbiomes. This is expected to lead to the development of new therapeutic strategies and enhance our understanding of microbes' roles in health and disease.