

Bacterial Cell-to-Cell Communication

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Many bacterial diseases are caused by organisms growing together as communities or biofilms. These microorganisms have the capacity to regulate specific sets of genes coordinately by sensing and communicating amongst themselves, utilizing a variety of signals. This book examines the mechanisms of quorum sensing and cell-to-cell communication in bacteria, and the roles that these processes play in regulating virulence, bacterial interactions with host tissues, and microbial development. Recent studies suggest that microbial cell-to-cell communication plays an important role in the pathogenesis of a variety of disease processes. Furthermore, some bacterial signal molecules may possess immunomodulatory activity. Thus, understanding the mechanisms and outcomes of bacterial cell-to-cell communication has important implications for appreciating host-pathogen interactions and ultimately may provide new targets for antimicrobial therapies that block or interfere with these communication networks.

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Cover illustration: scanning electron micrograph of a 24-hour biofilm generated by a quorum sensing mutant (HapR-deficient) of *Vibrio cholerae*. HapR mutants produce thicker and denser biofilms than wild-type *Vibrio cholerae* and exhibit accumulated extracellular material, suggesting that HapR biofilms overproduce extracellular matrix that is presumably composed of exopolysaccharide. Photograph provided by J. Zhu and J. J. Mekalanos.

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