

ABOUT THE COVER

The ocean, like most environments, is teeming with microbes. In the close-up view shown here, we see a community of bacteria that have formed a biofilm on a submerged pylon, living within a matrix of polymers that they have produced. These organisms communicate with one another and with free microbes through secreted signal molecules, a form of communication known as quorum sensing, depicted here as a light blue glow. Researchers may study DNA sequence information, shown in the background, to analyze genes regulated by this form of communication. Although not shown in this illustration, eukaryal microbes and viruses also exist in this environment. All of these microbes have evolved to effectively interact with each other and the environment, making them well adapted to this specific niche. Today, researchers use various techniques to study complex microbial communities, like biofilms, and the physiology, ecology, and genetics of individual microbial species. As we will see throughout this textbook, basic research into these three pillars of microbiology contributes to our understanding of this interconnected, dynamic, and exciting field.

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