Formation of the microcolonies on surfaces is an important bacterial survival strategy. These biofilms occur on both inert and living systems, making them important to a wide range of scientific disciplines.

This book first provides an analysis of the chemical, ecological and physical processes involved in the development of biofilms and their interactions with surfaces.

The next section deals with biofilms on non-living surfaces. Biofilms have important engineering implications, such as in mining industries, the corrosion of pipelines and pure and waste water industries. They also have medical significance when associated with the mouth, urinary tract and urogenital tract. In addition, they form in plant root systems and in animals, for example in the ruminant digestive tract, and so are agriculturally important. The final section examines these interactions with living surfaces.
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Microbial Biofilms
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Microbial Biofilms

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Series Preface

Plant and Microbial Biotechnology

The primary concept of this series of books is to produce volumes covering the integration of plant and microbial biology in modern biotechnological science. Illustrations abound: for example, the development of plant molecular biology has been heavily dependent on the use of microbial vectors, and the growth of plant cells in culture has largely dawn on microbial fermentation technology. In both of these cases the understanding of microbial processes is now benefitting from the enormous investments made in plant biotechnology. It is interesting to note that many educational institutions are also beginning to see things in this way and are integrating departments previously separated by artificial boundaries.

Many definitions have been proposed for biotechnology but the only one which has specifically defined environmental biotechnology is that of the European Federation of Biotechnology as The specific application of biotechnology to the management of environmental problems, including waste treatment, pollution control and integration with non-biological technologies. The study of microbial biofilms is clearly an excellent illustration of environmental biotechnology. The manipulation and control of biofilms is of great interest to industries, including agriculture, chemicals and healthcare.

One of the leaders in the study of biofilms has been Bill Costerton, especially in his early studies when he produced superb electron micrographs to demonstrate the fascinating microbial assemblages which developed in biofilms. However, he rapidly proceeded to demonstrate important physiological functions which occurred in these interesting layers. In 1986, Hilary Lappin-Scott joined him to work partly in Cambridge and partly in Calgary on the biofilms associated with oil wells, so starting a long and productive association. Hilary went on to the University of Exeter in 1990 to create a research group on biofilms which is proving to have substantive inputs in a range of environmental and industrial fields. I had known Hilary since her days as a research student at the University of Warwick and found myself talking to her about biofilms on more than one occasion when we were both warming-up at the start of London marathons! I was delighted when Hilary said that she would be prepared to contribute a volume to the series with Bill Costerton. They have produced a textbook which covers not only the fundamentals of this important subject, but also provides a range of diverse applications.

Jim Lynch

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