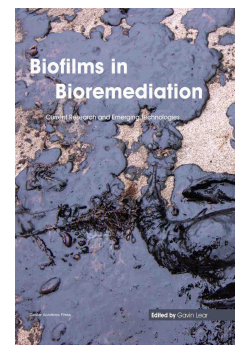


Biofilms in Bioremediation

Current Research and Emerging Technologies



Edited by: Gavin Lear

The University of Auckland, New Zealand

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The microbial bioremediation of contaminants is cost effective and reliable and a number of approaches are in widespread commercial use. Microbial bioremediation makes use of the metabolic activities of biofilm-dwelling microorganisms which are responsible for the majority of pollutant degradation in natural environments.

In this book, renowned scientists from around the world provide up-to-date and authoritative reviews of the latest scientific research that has contributed to our understanding of the vital importance of microbial biofilms for the biological remediation of contaminated environments. The results of a variety of key case studies are presented to highlight the broad range of treatment approaches and applications at our disposal. In addition, the authors discuss the future trends and likely growth areas in biofilm-related research.

This comprehensive volume is indispensable for anyone involved in bioremediation, biofilm research or environmental microbiology. It is also recommended as a reference work for all microbiology libraries.

Chapter 1. Engineering Successful Bioremediation (*Michael Harbottle*)

Chapter 2. The Biofilm Concept from a Bioremediation Perspective (*Benjamin Horemans, Pieter Albers and Dirk Springael*)

Chapter 3. Biofilm Survival Strategies in Polluted Environments (*Marc A. Demeter, Joseph A. Lemire, Raymond J. Turner and Joe J. Harrison*)

Chapter 4. Tactic Responses of Bacteria to Pollutants: Implications for the Degradation Efficiency of Microbial Biofilms (*Diana L. Vullo*)

Chapter 5. Whole-cell Biosensors for Monitoring Bioremediation (*Audrey S. Commault and Richard J. Weld*)

Chapter 6. Modern Methods in Microscopy for the Assessment of Biofilms and Bioremediation (*Guneratna Kuttuva Rajarao*)

Chapter 7. Molecular Methods for the Assessment of Microbial Biofilms in Bioremediation (*Gavin Lear*)

Chapter 8. Biofilm-mediated Degradation of PAHs and Pesticides (*M. Pazos, L. Ferreira, E. Rosales and M.A. Sanromán*)

Chapter 9. Detoxification of Hexavalent Chromium from Industrial Wastewater using a Bacterial Biofilm System (*Zainul Akmar Zakaria, Wan Azlina Ahmad, Wan Haslinda Wan Ahmad and Sindhu Mathew*)

Chapter 10. Hydrocarbonoclastic Biofilms (*Dina M. Al-Mailem and Samir S. Radwan*)

Chapter 11. Use of Biofilm Permeable Reactive Barriers for the *In Situ* Remediation of Mobile Contaminants (*Youngwoo Young Seo*)

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Chapter 13A. Using Microbial Biofilms to Enhance the Phytoremediation of Contaminants in Soil and Water. Part A: A Trial for Sustainable Phenol Degradation by Duckweed-colonizing Biofilms (*Masaaki Morikawa, Fumiko Yamaga, Kazuya Suzuki, Koki Kurashina, Kyoko Miwa and Kenji Washio*)

Chapter 13B. Using Microbial Biofilms to Enhance the Phytoremediation of Contaminants in Soil and Water. Part B: The Sustainable Biodegradation of Phenolic Endocrine-disrupting Chemicals by Bacteria in the Rhizosphere of *Phragmites australis* (*Tadashi Toyama and Kazuhiro Mori*)

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