

Contents

Part I Introduction

- 1 **Organohalide-Respiring Bacteria—An Introduction** 3
Lorenz Adrian and Frank E. Löffler
- 2 **Natural Production of Organohalide Compounds
in the Environment** 7
James A. Field
- 3 **Energetic Considerations in Organohalide Respiration** 31
Jan Dolfig

Part II Diversity of Organohalide-Respiring Bacteria

- 4 **Discovery of Organohalide-Respiring Processes
and the Bacteria Involved** 51
Perry L. McCarty
- 5 **Overview of Known Organohalide-Respiring Bacteria—
Phylogenetic Diversity and Environmental Distribution** 63
Siavash Atashgahi, Yue Lu and Hauke Smidt
- 6 **The Genus *Dehalococcoides*** 107
Stephen H. Zinder
- 7 **The Genus *Dehalogenimonas*** 137
William M. Moe, Fred A. Rainey and Jun Yan
- 8 **The Genus *Dehalobacter*** 153
Julien Maillard and Christof Holliger
- 9 **The Genus *Desulfotobacterium*** 173
Taiki Futagami and Kensuke Furukawa
- 10 **The Genus *Sulfurospirillum*** 209
Tobias Goris and Gabriele Diekert

11	Organohalide-Respiring <i>Deltaproteobacteria</i>	235
	Robert A. Sanford, Janamejaya Chowdhary and Frank E. Löffler	
12	Comparative Physiology of Organohalide-Respiring Bacteria	259
	Koshlan Mayer-Blackwell, Holly Sewell, Maeva Fincker and Alfred M. Spormann	

Part III Ecology of Organohalide-Respiring Bacteria

13	Electron Acceptor Interactions Between Organohalide-Respiring Bacteria: Cross-Feeding, Competition, and Inhibition	283
	Kai Wei, Ariel Grostern, Winnie W.M. Chan, Ruth E. Richardson and Elizabeth A. Edwards	
14	Organohalide-Respiring Bacteria as Members of Microbial Communities: Catabolic Food Webs and Biochemical Interactions	309
	Ruth E. Richardson	

Part IV Genomics and Regulation of Organohalide-Respiring Bacteria

15	Comparative Genomics and Transcriptomics of Organohalide-Respiring Bacteria and Regulation of <i>rdh</i> Gene Transcription	345
	Thomas Kruse, Hauke Smidt and Ute Lechner	
16	Diversity, Evolution, and Environmental Distribution of Reductive Dehalogenase Genes	377
	Laura A. Hug	

Part V Biochemistry of Organohalide-Respiring Bacteria

17	Comparative Biochemistry of Organohalide Respiration	397
	Torsten Schubert and Gabriele Diekert	
18	Evaluation of the Microbial Reductive Dehalogenation Reaction Using Compound-Specific Stable Isotope Analysis (CSIA)	429
	Julian Renpenning and Iivonne Nijenhuis	
19	Corrinoid Metabolism in Dehalogenating Pure Cultures and Microbial Communities	455
	Theodore C. Moore and Jorge C. Escalante-Semerena	
20	Insights into Reductive Dehalogenase Function Obtained from Crystal Structures	485
	Holger Dobbek and David Leys	

Part VI Applications

- 21 Redox Interactions of Organohalide-Respiring Bacteria (OHRB) with Solid-State Electrodes: Principles and Perspectives of Microbial Electrochemical Remediation** 499
Federico Aulenta, Simona Rossetti, Bruna Matturro, Valter Tandoi, Roberta Verdini and Mauro Majone
- 22 Current and Future Bioremediation Applications: Bioremediation from a Practical and Regulatory Perspective**..... 517
Robert J. Steffan and Charles E. Schaefer
- 23 The Microbiology of Anaerobic PCB Dechlorination** 541
Jianzhong He and Donna L. Bedard
- 24 “*Dehalobium chlorocoercia*” DF-1—from Discovery to Application**..... 563
Harold D. May and Kevin R. Sowers
- 25 Use of Compound-Specific Isotope Analysis (CSIA) to Assess the Origin and Fate of Chlorinated Hydrocarbons** 587
Daniel Hunkeler

Part VII Outlook

- 26 Outlook—The Next Frontiers for Research on Organohalide-Respiring Bacteria**..... 621
Lorenz Adrian and Frank E. Löffler
- Index**..... 629