

Pathogenic *Treponema*

Molecular and Cellular Biology



Edited by: **Justin D. Radolf and Sheila A. Lukehart**

University of Connecticut Health Center, Farmington, CO 06030-3715, USA and University of Washington School of Medicine, Seattle, WA 98104, USA respectively

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In the past *Treponema* research was severely handicapped because the organisms were notoriously difficult to work with and were unculturable in the laboratory. Powerful molecular and genetic tools developed in recent years have been successfully used to dramatically expand our understanding of treponemal diversity, genomics, and cellular and molecular biology. Major breakthroughs include sequencing of *Treponema* genomes and the development of modern molecular methods.

This volume is the first comprehensive review of treponemal research to be published in more than twenty years. Written by leading experts in the field, this book presents the current state of research on these organisms that affect the health of millions of people worldwide. The structure and metabolism of the treponemes are explored in light of the comparative genomics data now available. The newest information concerning their pathogenic mechanisms, as well as the complex innate and adaptive immune responses they elicit, are detailed. A number of chapters illustrate how our knowledge of syphilis has grown in the molecular era despite the continuing inability to propagate its elusive etiologic agent. The book also provides an historical perspective on treponemal research that will be of considerable interest. This compilation will serve as an essential reference for microbiologists, immunologists, and physicians who deal with these organisms on a day-by-day basis or who wish to understand them better in the context of contemporary microbiology.

Topics covered include the phylogenetic diversity, comparative genomics, metabolism and cultivation, motility, antigenic variation, immunology of syphilis, the use cultivatable treponemes as surrogates for *T. pallidum*, oral treponemes, and much much more.

Essential reading for all scientists and researchers working on treponemes and other spirochetes and a recommended reference book for all microbiology laboratories.

Chapter 1. The Phylogenetic Diversity of the Genus *Treponema*. *Bruce J. Paster and Floyd E. Dewhirst*

Chapter 2. Comparative Genomics of Spirochetes. *Steven J. Norris and George M. Weinstock*

Chapter 3. Structural and Genomic Features of Treponemal Architecture. *Jacques Izard and Ronald J. Limberger*

Chapter 4. Metabolism of the *Treponema*. *David L. Cox and Justin D. Radolf*

Chapter 5. Metal Utilization and Oxidative Stress. *Frank Gherardini, Julie Boylan and Paul Brett*

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Chapter 7. Chemotaxis Signaling Systems in Spirochetes: Their Role in Directed Cell Movement and Pathogenesis. *Renate Lux and Wenyuan Shi*

Chapter 8. Genetic Manipulation of Cultivable Treponemes. *Howard K. Kuramitsu*

Chapter 9. Historical Evidence of Syphilis and Other Treponemes. *By Laura J. McGough and Emily Erbeling*

Chapter 10. Pathogenesis of Syphilis. *Justin D. Radolf, Karsten R. O. Hazlett, and Sheila A. Lukehart*

Chapter 11. The *T. pallidum* Outer Membrane and Outer Membrane Proteins. *Caroline E. Cameron*

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Chapter 16. Innate and Adaptive Immune Responses to Oral Treponemes. *Nicolas W.J. Schröder, Ralf R. Schumann, and Ulf B. Göbel*

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