Streptococcus is a diverse genus of Gram-positive bacteria commonly found in multiple locations of their human and animal hosts e.g. the oral cavity and the upper respiratory tract. Many streptococci are commensals thus play a role in colonization resistance of the host. Others, however, are pathogenic and are responsible for a range of invasive and noninvasive diseases with high morbidity and mortality worldwide. Streptococci undergo frequent and extensive horizontal gene transfer leading to the emergence of drug resistant strains. This, combined with the current lack of effective anti-streptococcal vaccines, has led to a huge amount of research into the genomics to systems biology of these important bacteria.

This timely review, edited by Yuqing Li and Xuedong Zhou, provides a comprehensive overview of the current knowledge of the most important hot-topics in streptococcal research. Topics covered include: CRISPR-Cas systems; genetic regulation by small RNAs; signal transduction by cyclic dinucleotide second messengers; the VicRK and ComDE two-component systems; mobile genetic elements; regulation of cell division; application of omics and bioinformatics tools; intragenic and intergeneric interactions by oral streptococci; the hypervirulent M1T1 clone of GAS; Streptococcus suis; adhesion and invasion mechanisms; molecular evolution of pathogenic streptococci; novel antimicrobials; vaccine development.

This volume is essential reading for everyone working with streptococci from the PhD student to the experienced scientist, in academia, the pharmaceutical or biotechnology industries and for those working in clinical environments.

- Chapter 1. CRISPR-Cas Systems in Streptococci (Tao Gong, Miao Lu, Xuedong Zhou, Anqi Zhang, Boyu Tang, Jiamin Chen, Meiling Jing and Yuqing Li)
- Chapter 2. Genetic Regulation of Streptococci by Small RNAs (Ye Tu, Xiaoyue Jia, Ran Yang, Xian Peng, Xuedong Zhou and Xin Xu)
- Chapter 3. Signal Transduction of Streptococci by Cyclic Dinucleotide Second Messengers (Zhengyi Li, Xueqin Zhang, Lei Cheng, Xin Xu, Xuedong Zhou, Hui Wu and Xian Peng)
- Chapter 4. Mobile Genetic Elements in Streptococci (Miao Lu, Tao Gong, Anqi Zhang, Boyu Tang, Jiamin Chen, Zhong Zhang, Yuqing Li and Xuedong Zhou)
- Chapter 5. The VicRK Two-Component System Regulates Streptococcus mutans Virulence (Lei Lei, Li Long, Xin Yang, Yang Oiu, Yanglin Zeng, Tao Hu, Shida Wang and Yuqing Li)
- Chapter 6. ComDE Two-component Signal Transduction Systems in Oral Streptococci: Structure and Function (Yue Zu, Wei Li, Qi Wang, Jiahao Chen and Qiang Guo)
- Chapter 7. Regulation of Cell Division in Streptococci: Comparing with the Model Rods (Zhenting Xiang, Zongbo Li, Jumei Zeng, Yuqing Li and Jiyao Li)
- Chapter 8. Application of Omics and Bioinformatics Tools in Streptococcus Research (Min Liao, Ting Tong, Yawen Zong, Xuedong Zhou, Lei Cheng, Ruijie Huang, Biao Ren and Gil Alterovitz)
- Chapter 9. Intragenic and Intergeneric Interactions Developed by Oral Streptococci: Pivotal Role in the Pathogenesis of Oral Diseases (Yandi Chen, Yuqing Li and Jing Zou)
- Chapter 10. The Emergence of Hypervirulent M1T1 Clone of Group A Streptococcus via Genetic Recombination and Host Selection (Guanghui Liu)
- Chapter 11. Recent Proceedings on Prevalence and Pathogenesis of Streptococcus suis (Chen Tan, Anding Zhang, Huanchun Chen and Rui Zhou)
- Chapter 12. The Adhesion and Invasion Mechanisms of Streptococci (Qingsong Jiang, Xuedong Zhou, Lei Cheng and Mingyun Li)
- Chapter 13. Molecular Evolution of Clinical Pathogenic Streptococci (Dongdong Li and Chuanmin Tao)
- Chapter 14. Progress of Antimicrobial Discovery Against the Major Caricogenic Pathogen Streptococcus mutans (Tao Cui, Wentu Luo, Letong Xu, Baoliang Yang, Wen Zhao and HuaiXing Cang)
- Chapter 15. Recent Advances in Pathogenic Streptococcus Vaccine Development (Hongren Wang, Zhen Qin and Mingyuan Li)
CURRENT BOOKS OF INTEREST

Pathogenic Streptococci: From Genomics to Systems Biology and Control
Edited by: Yuqing Li and Xuedong Zhou (Published: 2019)

Bats and Viruses: Current Research and Future Trends
Edited by: Eugenia Corrales-Aguilar and Martin Schwemmle (Published: 2020)

SUMOylation and Ubiquitination: Current and Emerging Concepts
Edited by: Van G. Wilson (Published: 2019)

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Edited by: Siba K. Samal (Published: 2019)

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Edited by: Bryony C. Bonning (Published: 2019)

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Edited by: Jörg Tatzelt (Published: 2010)

Plant Genomics
Edited by: Hany A. El-Shemy (Published: 2009)

Methylotrophs and Methylotroph Communities
Edited by: Ludmila Chistoserdova (Published: 2019)

Microbial Ecology: Current Advances from Genomics, Metagenomics and Other Omics
Edited by: Diana Marco (Published: 2019)

Plant-Microbe Interactions in the Rhizosphere
Edited by: Adam Schikora (Published: 2018)
"recommended for anyone involved in plant science or environmental microbiology" (Biotechnol. Agron. Soc. Environ.); "an authoritative overview" (Eur. J. Soil Sci.)

Prions: Current Progress in Advanced Research (Second Edition)
Edited by: Akikazu Sakudo and Takashi Onodera (Published: 2019)

Microbiota: Current Research and Emerging Trends
Edited by: Takashi Matsumoto and Yoshio Yamaoka (Published: 2019)

Porcine Viruses: From Pathogenesis to Strategies for Control
Edited by: Hovakim Zakaryan (Published: 2019)
"This is a well-written book" (Doodys)

Lactobacillus Genomics and Metabolic Engineering
Edited by: Sandra M. Ruzal (Published: 2019)
"the most relevant aspects of the more than 200 recognized species of the Lactobacillus genus" (ProtoView); "a useful, concise reference book" (Beneficial Microbes)

Cyanobacteria: Signaling and Regulation Systems
Author: Dmitry A. Los (Published: 2018)
"a very good summary ... recommended" (Biospektrum)

Viruses of Microorganisms
Edited by: Paul Hyman and Stephen T. Abedon (Published: 2018)

Protozoan Parasitism: From Omics to Prevention and Control
Edited by: Luis Miguel de Pablos Torró and Jacob-Lorenzo Morales (Published: 2018)

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