

# Pathogenic Streptococci

## From Genomics to Systems Biology and Control

*Edited by:*

**Yuqing Li and Xuedong Zhou**

State Key Laboratory of Oral Diseases  
National Clinical Research Center for Oral Diseases  
West China Hospital of Stomatology  
Sichuan University  
Chengdu 610041, China



**Copyright © 2019**

Caister Academic Press  
Norfolk, UK

[www.caister.com](http://www.caister.com)

British Library Cataloguing-in-Publication Data  
A catalogue record for this book is available from the British Library

**ISBN: 978-1-912530-22-9 (book)**

**ISBN: 978-1-912530-23-6 (ebook)**

Description or mention of instrumentation, software, or other products in this book does not imply endorsement by the author or publisher. The author and publisher do not assume responsibility for the validity of any products or procedures mentioned or described in this book or for the consequences of their use.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior permission of the publisher. No claim to original Government works.

# Contents

<b>Chapter 1</b> .....	<b>1</b>
CRISPR-Cas Systems in Streptococci <i>Tao Gong, Miao Lu, Xuedong Zhou, Anqi Zhang, Boyu Tang, Jiamin Chen, Meiling Jing and Yuqing Li</i>	
<b>Chapter 2</b> .....	<b>39</b>
Genetic Regulation of Streptococci by Small RNAs <i>Ye Tu, Xiaoyue Jia, Ran Yang, Xian Peng, Xuedong Zhou and Xin Xu</i>	
<b>Chapter 3</b> .....	<b>87</b>
Signal Transduction of Streptococci by Cyclic Dinucleotide Second Messengers <i>Zhengyi Li, Xueqin Zhang, Lei Cheng, Xin Xu, Xuedong Zhou, Hui Wu and Xian Peng</i>	
<b>Chapter 4</b> .....	<b>123</b>
Mobile Genetic Elements in Streptococci <i>Miao Lu, Tao Gong, Anqi Zhang, Boyu Tang, Jiamin Chen, Zhong Zhang, Yuqing Li and Xuedong Zhou</i>	
<b>Chapter 5</b> .....	<b>167</b>
The VicRK Two-Component System Regulates <i>Streptococcus mutans</i> Virulence <i>Lei Lei, Li Long, Xin Yang, Yang Qiu, Yanglin Zeng, Tao Hu, Shida Wang and Yuqing Li</i>	
<b>Chapter 6</b> .....	<b>201</b>
ComDE Two-component Signal Transduction Systems in Oral Streptococci: Structure and Function <i>Yue Zu, Wei Li, Qi Wang, Jiahao Chen and Qiang Guo</i>	
<b>Chapter 7</b> .....	<b>259</b>
Regulation of Cell Division in Streptococci: Comparing with the Model Rods <i>Zhenting Xiang, Zongbo Li, Jumei Zeng, Yuqing Li and Jiyao Li</i>	
<b>Chapter 8</b> .....	<b>327</b>
Application of Omics and Bioinformatics Tools in <i>Streptococcus</i> Research <i>Min Liao, Ting Tong, Yawen Zong, Xuedong Zhou, Lei Cheng, Ruijie Huang, Biao Ren and Gil Alterovitz</i>	
<b>Chapter 9</b> .....	<b>377</b>
Intragenetic and Intergeneric Interactions Developed by Oral Streptococci: Pivotal Role in the Pathogenesis of Oral Diseases <i>Yandi Chen, Yuqing Li and Jing Zou</i>	
<b>Chapter 10</b> .....	<b>435</b>
The Emergence of Hypervirulent M1T1 Clone of Group A <i>Streptococcus</i> via Genetic Recombination and Host Selection <i>Guanghui Liu</i>	
<b>Chapter 11</b> .....	<b>473</b>
Recent Proceedings on Prevalence and Pathogenesis of <i>Streptococcus suis</i> <i>Chen Tan, Anding Zhang, Huanchun Chen and Rui Zhou</i>	

<b>Chapter 12</b> .....	<b>521</b>
The Adhesion and Invasion Mechanisms of Streptococci	
<i>Qingsong Jiang, Xuedong Zhou, Lei Cheng and Mingyun Li</i>	
<b>Chapter 13</b> .....	<b>561</b>
Molecular Evolution of Clinical Pathogenic Streptococci	
<i>Dongdong Li and Chuanmin Tao</i>	
<b>Chapter 14</b> .....	<b>601</b>
Progress of Antimicrobial Discovery Against the Major Cariogenic Pathogen <i>Streptococcus mutans</i>	
<i>Tao Cui, Wenfu Luo, Letong Xu, Baoqiang Yang, Wen Zhao and Huaixing Cang</i>	
<b>Chapter 15</b> .....	<b>645</b>
Recent Advances in Pathogenic <i>Streptococcus</i> Vaccine Development	
<i>Hongren Wang, Zhen Qin and Mingyuan Li</i>	