

CONTENTS

Contributors	ix
1. Energetics of Pathogenic Bacteria and Opportunities for Drug Development	1
Gregory M. Cook, Chris Greening, Kiel Hards, and Michael Berney	
1. Introduction	2
2. Bacterial Energetics as a Target Space for Drug Development	2
3. Conclusions and Future Perspectives	40
Acknowledgements	43
References	44
2. The Impact of Horizontal Gene Transfer on the Biology of <i>Clostridium difficile</i>	63
Adam P. Roberts, Elaine Allan, and Peter Mullany	
1. Introduction to <i>Clostridium difficile</i> and CDI	64
2. Introns	65
3. IStrons	66
4. Mobilisable Transposons	67
5. Conjugative Transposons	69
6. Other Integrative MGEs in <i>C. difficile</i>	73
7. The <i>skin</i> ^{Cd} Element	73
8. Bacteriophages	74
9. Transfer of the PaLoc	75
10. Conclusions	78
References	79
3. Metal Ion Homeostasis in <i>Listeria monocytogenes</i> and Importance in Host-Pathogen Interactions	83
Helen E. Jesse, Ian S. Roberts, and Jennifer S. Cavet	
1. Introduction	84
2. Overview of <i>Listeria monocytogenes</i> Disease Progression	86
3. Control of Metal Levels in Bacteria	89
4. <i>L. monocytogenes</i> and Zinc	90
5. <i>L. monocytogenes</i> and Copper	104

6. Concluding Remarks	111
References	112
4. The Role of Macrophages in the Innate Immune Response to <i>Streptococcus pneumoniae</i> and <i>Staphylococcus aureus</i>: Mechanisms and Contrasts	125
Joby Cole, Jody Aberdein, Jamil Jubrail, and David H. Dockrell	
1. Introduction	126
2. <i>S. pneumoniae</i> Virulence Factors Impede Phagocytosis and Its Consequences	129
3. <i>S. aureus</i> Virulence Factors Subvert Multiple Innate Immune Responses Including Intracellular Killing	133
4. Origins of Macrophages	138
5. The Spectrum of Macrophage Activation	140
6. Epigenetic Regulation of Macrophage Function	144
7. Mechanisms of Macrophage Phagocytosis	153
8. Phagocytosis of <i>S. pneumoniae</i> and <i>S. aureus</i>	155
9. Intracellular Localisation of Bacteria	160
10. Microbial Killing by Macrophages	162
11. Apoptosis-Associated Killing Complements Clearance of <i>S. pneumoniae</i>	165
12. Macrophage Killing of <i>S. aureus</i>	169
13. Macrophage Orchestration of the Inflammatory Response	171
14. Pattern Recognition Receptors in the Recognition of <i>S. pneumoniae</i> and <i>S. aureus</i>	174
15. Conclusion	178
Conflict of Interest	178
References	179
5. <i>Aeromonas</i> Flagella and Colonisation Mechanisms	203
Rebecca Lowry, Sabela Balboa, Jennifer L. Parker, and Jonathan G. Shaw	
1. Introduction	204
2. Flagella	206
3. Lipopolysaccharide and Capsules	223
4. Pili	228
5. Outer-Membrane Proteins and S-Layer	231
6. <i>Aeromonas</i> Colonisation and Host Response	236

7. Conclusions and Outlook	242
References	246
6. Physiological Adaptations of Key Oral Bacteria	257
C.W. Ian Douglas, Kathryn Naylor, Chatchawal Phansopa, Andrew M. Frey, Thomas Farmilo, and Graham P. Stafford	
1. Introduction	258
2. Key Oral Environmental Niches	258
3. The Major Infections of the Oral Cavity	263
4. Bacterial Adaptations in the Oral Cavity	278
5. Surface Adhesins as Colonisation Factors of Oral Bacteria	299
6. Stress Responses of Import in Colonisation and Infection by Oral Bacteria	309
7. Summary and Future Perspectives	312
Acknowledgements	313
References	313
7. Virulence Factors of Uropathogenic <i>E. coli</i> and Their Interaction with the Host	337
Petra Lüthje and Annelie Brauner	
1. Introduction	338
2. Pathogenesis of Urinary Tract Infection	339
3. Adhesins	342
4. Toxins	350
5. Iron-Acquisition Systems	353
6. Immune Evasion Mechanisms	355
7. Conclusion	358
References	359
<i>Author Index</i>	373
<i>Subject Index</i>	431