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0521835046 - Salmonella Infections: Clinical, Immunological and Molecular Aspects

Edited by Pietro Mastroeni and Duncan Maskell

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## ***Salmonella* Infections**

### **Clinical, Immunological and Molecular Aspects**

*Salmonella enterica* encompasses a diverse range of bacteria that cause a spectrum of diseases in many hosts. Advancements in prevention and treatment of *S. enterica* infections have at times been hampered by compartmentalization of research efforts and lack of multidisciplinary approaches. This book attempts to cover a diverse range of topics related to the biology of *S. enterica* infections, including epidemiological and clinical aspects, molecular pathogenesis, immunity to disease and vaccines. *Salmonella enterica* infections are important zoonoses and therefore material on infections of animals and public health issues have also been considered. Each chapter can be read independently, but the full contents of the book will provide the reader with up-to-date knowledge on all the key aspects of salmonellosis in humans and animals. It will therefore be of interest to graduate students and researchers, as well as to clinicians, whose research focuses on this important pathogen.

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Frontmatter

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Frontmatter

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Frontmatter

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# *Salmonella* Infections

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EDITED BY

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To our families and friends

TO CARLOS

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0521835046 - Salmonella Infections: Clinical, Immunological and Molecular Aspects

Edited by Pietro Mastroeni and Duncan Maskell

Frontmatter

[More information](#)

## Contents

<i>List of contributors</i>	page xiv
<i>Preface</i>	xviii
<b>1 Epidemiological and clinical aspects of human typhoid fever</b>	<b>1</b>
1.1 Introduction	1
1.2 <i>Salmonella enterica</i> serovar Typhi	2
1.3 Epidemiology of typhoid fever	2
1.4 Pathophysiology of typhoid fever	6
1.5 Clinical features of typhoid fever	7
1.6 Diagnosis of typhoid fever	9
1.7 Management of typhoid fever	11
1.8 Control and prevention of typhoid fever	16
1.9 Conclusions	17
<b>2 Antibiotic resistance in <i>Salmonella</i> infections</b>	<b>25</b>
2.1 Introduction	25
2.2 Antibiotic resistance in <i>S. enterica</i> serovar Typhi	27
2.3 Antibiotic resistance in enteric fevers other than typhoid	36
2.4 Antibiotic resistance in non-typhoid <i>Salmonella enterica</i> serovars	36
2.5 The causes of resistance	43
2.6 Conclusions	48
<b>3 Host-specificity of <i>Salmonella</i> infections in animal species</b>	<b>57</b>
3.1 Introduction	57
3.2 <i>Salmonella</i> infections of cattle	58
3.3 <i>Salmonella</i> infections of pigs	64
3.4 <i>Salmonella</i> infections of domestic fowl and other avian species	68

Cambridge University Press

0521835046 - Salmonella Infections: Clinical, Immunological and Molecular Aspects

Edited by Pietro Mastroeni and Duncan Maskell

Frontmatter

[More information](#)

x

CONTENTS

3.5	What are the determinants of <i>Salmonella</i> serovar host-specificity?	73
3.6	Do host-specific serovars use a strategy of stealth to cause systemic disease?	76
3.7	Dissemination of <i>Salmonella</i> to systemic tissues – an evolutionary dead-end or an alternative means of inter-animal spread?	77
3.8	Conclusions	79
3.9	Acknowledgements	80
<b>4</b>	<b>Public health aspects of <i>Salmonella enterica</i> in food production</b>	<b>89</b>
4.1	Introduction and historical perspective	89
4.2	Recent trends in <i>S. enterica</i> infections	90
4.3	Human disease caused by <i>S. enterica</i> and vehicles for its transmission to humans	92
4.4	Animal reservoirs of <i>S. enterica</i> infection	94
4.5	Milk and milk products as vehicles of infection	96
4.6	Meat and meat products and <i>S. enterica</i>	97
4.7	Contamination of poultry meat with <i>S. enterica</i>	98
4.8	Eggs and egg products as vehicles of infection and the <i>S. enterica</i> serovar Enteritidis pandemic	100
4.9	The infectious dose of <i>S. enterica</i>	105
4.10	Conclusions	107
<b>5</b>	<b>The <i>Salmonella</i> genome: a global view</b>	<b>117</b>
5.1	Introduction	117
5.2	Full genome sequences facilitate the study of <i>Salmonella</i>	117
5.3	Comparative genomics: old and new techniques	118
5.4	<i>In silico</i> tools for comparative genomics	119
5.5	Microarray technology as a tool for comparative genomics	120
5.6	Sequenced <i>Salmonella</i> genomes as tools for comparative genomics	121
5.7	<i>In silico</i> analysis of <i>Salmonella</i> genomes and comparisons between genome sequences	124
5.8	Mobile genetic elements: plasmids and bacteriophages	130
5.9	Fimbrial and pilus genes are highly variable between <i>Salmonella</i> genomes	133
5.10	Analysis of <i>Salmonella</i> genomes based on microarray technology	134



Cambridge University Press

0521835046 - Salmonella Infections: Clinical, Immunological and Molecular Aspects

Edited by Pietro Mastroeni and Duncan Maskell

Frontmatter

[More information](#)

5.11 Genome sequences facilitate functional genomics	135
5.12 Conclusions	136
5.13 Acknowledgements	137
<b>6 Pathogenicity islands and virulence of <i>Salmonella enterica</i></b>	<b>146</b>
6.1 Introduction	146
6.2 Pathogenicity islands of <i>Salmonella</i>	147
6.3 <i>Salmonella</i> Pathogenicity Island 1	148
6.4 <i>Salmonella</i> Pathogenicity Island 2	154
6.5 <i>Salmonella</i> Pathogenicity Island 3	158
6.6 <i>Salmonella</i> Pathogenicity Island 4	159
6.7 <i>Salmonella</i> Pathogenicity Island 5	159
6.8 <i>Salmonella</i> Pathogenicity Island 6 (or <i>Salmonella</i> centisome 7 genomic island)	160
6.9 <i>Salmonella</i> Pathogenicity Island 7 (or Major Pathogenicity Island)	161
6.10 <i>Salmonella</i> Pathogenicity Islands 8 to 10	162
6.11 <i>Salmonella</i> genomic island 1	163
6.12 High Pathogenicity Island	164
6.13 Other SPI of <i>Salmonella</i> ?	164
6.14 Conclusions	165
6.15 Acknowledgements	167
<b>7 In vivo identification, expression and function of <i>Salmonella</i> virulence genes</b>	<b>173</b>
7.1 Introduction	173
7.2 Identification of virulence genes in vivo	174
7.3 Regulation of the expression of virulence genes	185
7.4 Functions of virulence genes involved in gastroenteritis and systemic disease	191
7.5 Conclusions	195
7.6 Acknowledgements	195
<b>8 Mechanisms of immunity to <i>Salmonella</i> infections</b>	<b>207</b>
8.1 Introduction	207
8.2 Models for the study of immunity to <i>S. enterica</i>	207
8.3 Early events in the interaction between <i>S. enterica</i> and the immune system	208
8.4 <i>S. enterica</i> reaches the phagocytic cells in the infected tissues	210
8.5 Dynamics of <i>S. enterica</i> spread and distribution at the single cell level	211

Cambridge University Press

0521835046 - Salmonella Infections: Clinical, Immunological and Molecular Aspects

Edited by Pietro Mastroeni and Duncan Maskell

Frontmatter

[More information](#)

xii

CONTENTS

8.6	Innate immunity and control of the early growth of <i>S. enterica</i> in the tissues	215
8.7	Progressive bacterial growth in the tissues results in lethal infections	219
8.8	The activation of the adaptive innate immune response and the suppression of bacterial growth in sublethal infections	220
8.9	The clearance of a primary infection requires the presence of T-cells	224
8.10	The initiation and development of antigen-specific immunity	225
8.11	Mechanisms of host resistance in secondary infections	228
8.12	Immunity to <i>S. enterica</i> infection in humans	230
8.13	Conclusions	237
8.14	Acknowledgements	239
9	Interactions of <i>S. enterica</i> with phagocytic cells	255
9.1	Introduction	255
9.2	Interactions of <i>S. enterica</i> with the macrophage endosomal pathways	256
9.3	Innate anti- <i>S. enterica</i> activity of the Nramp1 divalent metal transporter	258
9.4	Oxygen-dependent killing of <i>S. enterica</i>	260
9.5	Activation of macrophage activity against <i>S. enterica</i>	265
9.6	Conclusions	269
9.7	Acknowledgements	269
10	Interactions between <i>Salmonella</i> and dendritic cells: what happens along the way?	279
10.1	Introduction	279
10.2	Dendritic cells	279
10.3	Dendritic cells and the entry of <i>Salmonella</i> into the host	281
10.4	Dendritic cell interactions with <i>Salmonella</i> in the Peyer's patches	282
10.5	Dendritic cell interactions with <i>Salmonella</i> in mesenteric lymph nodes	284
10.6	Dendritic cell interactions with <i>Salmonella</i> in the spleen	286
10.7	Dendritic cell interactions with <i>Salmonella</i> in the liver	289
10.8	Conclusions	291
10.9	Acknowledgements	292

Cambridge University Press

0521835046 - Salmonella Infections: Clinical, Immunological and Molecular Aspects

Edited by Pietro Mastroeni and Duncan Maskell

Frontmatter

[More information](#)

11	Immunity to <i>Salmonella</i> in domestic (food animal) species	299
11.1	Introduction	299
11.2	Innate immunity	300
11.3	Adaptive immunity	304
11.4	Vaccines against <i>S. enterica</i> infections	308
11.5	Live <i>Salmonella</i> vaccines as vectors for the delivery of heterologous antigens in domestic species	311
11.6	Protection induced by live <i>S. enterica</i> vaccines by non-immune and non-specific immune mechanisms	312
11.7	Conclusions	313
12	Newer vaccines against typhoid fever and gastrointestinal salmonellosis	323
12.1	Introduction	323
12.2	Typhoid vaccines	323
12.3	Vaccines for use against non-typhoidal salmonellosis in humans	329
12.4	Vaccines for use in veterinary species	330
12.5	Novel approaches to the development of <i>S. enterica</i> vaccines	332
12.6	Conclusions	332
12.7	Acknowledgements	333
13	<i>S. enterica</i> -based antigen delivery systems	337
13.1	Introduction	337
13.2	<i>S. enterica</i> expressing heterologous antigens as multivalent vaccines	338
13.3	Expression systems for heterologous antigens in <i>S. enterica</i>	338
13.4	Immune responses against heterologous antigens expressed in <i>S. enterica</i>	344
13.5	<i>S. enterica</i> as a delivery system for DNA vaccines	349
13.6	New emerging applications of <i>S. enterica</i> as a vaccine vector	351
13.7	Conclusions	355
	<i>Index</i>	371

*The colour plates are situated between pages 206 and 207*

Cambridge University Press

0521835046 - Salmonella Infections: Clinical, Immunological and Molecular Aspects

Edited by Pietro Mastroeni and Duncan Maskell

Frontmatter

[More information](#)

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xiv

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Cambridge University Press

0521835046 - Salmonella Infections: Clinical, Immunological and Molecular Aspects

Edited by Pietro Mastroeni and Duncan Maskell

Frontmatter

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0521835046 - Salmonella Infections: Clinical, Immunological and Molecular Aspects

Edited by Pietro Mastroeni and Duncan Maskell

Frontmatter

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xvi

LIST OF CONTRIBUTORS

Cambridge University Press

0521835046 - Salmonella Infections: Clinical, Immunological and Molecular Aspects

Edited by Pietro Mastroeni and Duncan Maskell

Frontmatter

[More information](#)

## Preface

xvii

*Salmonella enterica* encompasses a diverse range of bacteria that cause a spectrum of diseases in many hosts. Typhoid fever is still a major killer of people in the developing world and rears its ugly head whenever war or natural disaster strikes. The increase in antibiotic resistance that has been observed in *S. enterica* serovar Typhi makes the understanding of this pathogen ever more important. But typhoid fever is not the only *Salmonella*-related disease that causes concern, with human gastrointestinal disease a major problem in developed and developing countries, not forgetting salmonellosis in livestock that bring with them economic losses as well as the problems of zoonoses and food-borne disease.

The different salmonellae make up a versatile and fascinating group of organisms that have inspired both of the Editors of this book since we were scientific juveniles studying the pathogenesis and immunity of these bacteria for our Ph.D. degrees. As we have moved through the stages of our scientific careers, other bacteria and immunological questions may have caught our attention for a while, but always the salmonellae persisted, providing the bedrock of our interests and the centrepiece of our scientific enquiries.

So why edit a book on salmonellae now? The easy answer to this question is that the study of the salmonellae is entering a brave new world with the completion of the genome sequences of serovars Typhi, Paratyphi A and Typhimurium, with other sequences hot on their tail. Add to this impetus the remarkable advances in whole genome analysis that have been allied to genome science, and that have especially opened the door on so many of the secrets of how salmonellae cause disease, and it begins to look like a really exciting time to be working with salmonellae. Add again advances in the study of the cellular biology of infection that have been made recently, especially in the context of the marvellous imaging technologies that are now

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Edited by Pietro Mastroeni and Duncan Maskell

Frontmatter

[More information](#)

available, and we begin to move to a position where the diseases caused by salmonellae might be understood at a level of detail unimaginable only ten years ago.

We hope that we have covered most of the key aspects of the biology of *Salmonella* infections in this book and that we have brought out some of the excitement in the field currently being felt by researchers. We have also been intent on embedding the basic science aspects of this book in real disease states, and so we have enthusiastically included chapters on the clinical diseases and public health problems caused by this group of bacteria.

Finally, science-based vaccines against salmonellae are already a reality. Improvements in our understanding of the immunology and vaccinology of these diseases may not only lead to control of these problems in the future but may also lead in unexpected directions. In fact, this intracellular pathogen can be used as a Trojan horse to introduce antigens from other organisms to a host's immune system, or indeed deliver other immunotherapeutics that might lead to treatments for a range of non-infectious diseases. We have tried to cover these exciting advances in the book.

It has been a pleasure editing this book, and an enormous education. It would not have been possible without timely and high quality papers from our contributors, to whom we would like to say thank you, and we hope you like the end product. We also hope that you the reader like the book, find it useful and most importantly of all, are enthused by it and by these fascinating organisms.

xviii

PREFACE