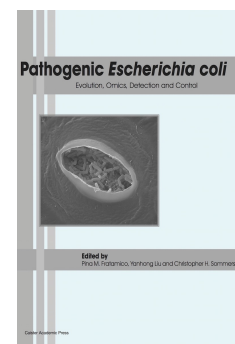


Pathogenic *Escherichia coli*

Evolution, Omics, Detection and Control



Edited by: Pina M. Fratamico, Yanhong Liu and Christopher H. Sommers

Eastern Regional Research Center, Agricultural Research Service, United States Department of Agriculture, Wyndmoor, USA

Published: April 2018. **Pages:** vi + 258

ISBN: Book: 978-1-910190-77-7. Ebook: 978-1-910190-78-4 £159, \$319

Published by: Caister Academic Press www.caister.com

Escherichia coli is an important member of the normal healthy microbiome of humans and other mammals. In addition, some strains are thought to be probiotic, and therefore beneficial to the host. However, other strains of *E. coli* have evolved into highly versatile, and frequently deadly, pathogens, the resultant diseases causing significant economic loss and public health burdens worldwide. Recent studies have shown that the *E. coli* genome has a high plasticity allowing it to adapt to new niches and survive in stressful conditions and to evolve into new hybrid strains with shared genes, including virulence genes. Omics and whole genome sequencing approaches have transformed research in this field allowing fascinating new insights into the molecular and cellular biology of the bacterium thus paving the way for the development of novel therapeutic strategies.

Under the expert guidance of the editors in this book, renowned international authors provide timely and up-to-date reviews of current cutting-edge *E. coli* omics, molecular- and cellular-biology research. Topics range from *E. coli* genome plasticity and evolution to the application of omics technologies for *in silico* modeling to understand stress-triggered physiological responses.

This authoritative volume is essential reading for scientists, both experts and students, working on pathogenic *E. coli* in academia, government, and biotechnology companies. It is also a must-read for anyone with an interest in bacterial pathogenesis and an important acquisition for all microbiology libraries.

Chapter 1. *Escherichia coli* Pathotypes (James L. Smith and Pina M. Fratamico)

Chapter 2. *Escherichia coli* Genome Plasticity and Evolution (David W. Lacher, Michael L. Kotewicz, Mark K. Mammel and Christopher A. Elkins)

Chapter 3. Diarrhoeagenic *Escherichia coli*: Virulence Genes and Other Markers for Detection and Typing (Stefano Morabito and Rosangela Tozzoli)

Chapter 4. Extra-intestinal Pathogenic *Escherichia coli* (ExPEC): Characteristics, Virulence Genes, Detection, and Control (Jeroen Geurtsen and Jan T. Poolman)

Chapter 5. Bacteriophage-based Strategies to Control Pathogenic *Escherichia coli* in Humans and Animals (Michca Gordon, Brigitte Cadieux and Lawrence D. Goodridge)

Chapter 6. New Developments in Detection Technologies for *Escherichia coli* and Other Pathogenic Organisms (Wen Ren, Renjie Wang, Lei Ouyang and Joseph Irudayaraj)

Chapter 7. Understanding Pathogenic *Escherichia coli* Through Whole-genome Sequencing (Valeria Michelacci and Eelco Franz)

Chapter 8. Use of Whole-genome Sequencing to Improve Investigations of Outbreaks of *Escherichia coli* (Claire Jenkins)

Chapter 9. Data Processing of *Escherichia coli* Genome Sequencing, Characterization, and Comparison (Gian Marco Baranzoni, Erin R. Reichenberger and David S. Needleman)

Chapter 10. Culture-independent Sequence-based Approaches for Diagnostics and Food Safety Testing (Susan R. Leonard and Christopher A. Elkins)

Chapter 11. Use of Omic Technologies to Develop Strategies to Control *Escherichia coli* from Farm to Table (Teresa M. Bergholz and Manoj K. Shah)

Chapter 12. Application of Omics Technologies for *in Silico* Modelling to Understand Stress-Triggered Physiology of *Escherichia coli* and to Develop Novel Therapeutics (Zuyi Huang, Qian Jia and Thomas K. Wood)

Order from:

Caister Academic Press <https://www.caister.com/order>

☞ **Porcine Viruses: From Pathogenesis to Strategies for Control**

Edited by: Hovakim Zakaryan (Published: 2019)

☞ ***Lactobacillus* Genomics and Metabolic Engineering**

Edited by: Sandra M. Ruzal (Published: 2019)

☞ **Cyanobacteria: Signaling and Regulation Systems**

Author: Dmitry A. Los (Published: 2018)

☞ **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 Torr  and Jacob-Lorenzo Morales (Published: 2018)

☞ **Genes, Genetics and Transgenics for Virus Resistance in Plants**

Edited by: Basavaprabhu L. Patil (Published: 2018)

☞ **DNA Tumour Viruses: Virology, Pathogenesis and Vaccines**

Edited by: Sally Roberts (Published: 2018)

☞ **Pathogenic *Escherichia coli*: Evolution, Omics, Detection and Control**

Edited by: Pina M. Fratamico, Yanhong Liu and Christopher H. Sommers (Published: 2018)

☞ **Postgraduate Handbook: A Comprehensive Guide for PhD and Master's Students and their Supervisors**

Author: Aceme Nyika (Published: 2018)

☞ **Enteroviruses: Omics, Molecular Biology, and Control**

Edited by: William T. Jackson and Carolyn B. Coyne (Published: 2018)

"frontiers in the study of the 12 species of the genus" (ProtoView); "the current most important enterovirus research" (Biotechnol. Agron. Soc. Environ.)

☞ **Molecular Biology of Kinetoplastid Parasites**

Edited by: Hemanta K. Majumder (Published: 2018)

☞ **Bacterial Evasion of the Host Immune System**

Edited by: Pedro Escoll (Published: 2017)

"The figures are expertly drawn" (SIMB News)

☞ **Illustrated Dictionary of Parasitology in the Post-Genomic Era**

Author: Hany M. Elsheikha and Edward L. Jarroll (Published: 2017)

"a guide for students, academic staff, medical and veterinarian professionals" (ProtoView); "an extensive and comprehensive glossary of contemporary concepts, terminologies, and vocabulary in modern parasitology" (Doody's); "a pure pleasure to explore and discover" (Epidemiol. Infect.); "highly recommended" (Biotechnol. Agron. Soc. Environ.)

☞ **Next-generation Sequencing and Bioinformatics for Plant Science**

Edited by: Vijai Bhaduria (Published: 2017)

☞ **The CRISPR/Cas System: Emerging Technology and Application**

Edited by: Muhammad Jamal (Published: 2017)

"reviews recent advances" (ProtoView)

☞ **Brewing Microbiology: Current Research, Omics and Microbial Ecology**

Edited by: Nicholas A. Bokulich and Charles W. Bamforth (Published: 2017)

"a valuable information source ... an authoritative overview" (IMA Fungus); "a must read book" (SIMB News)

☞ **Metagenomics: Current Advances and Emerging Concepts**

Edited by: Diana Marco (Published: 2017)

"presents those new to the field with important aspects of metagenomics" (Eur. J. Soil Sci.)

☞ ***Bacillus*: Cellular and Molecular Biology (Third edition)**

Edited by: Peter L. Graumann (Published: 2017)

"a one-stop shop for a huge range of *Bacillus*-focused molecular biology" (Microbiology Today)