

Sensory Mechanisms in Bacteria

Molecular Aspects of Signal Recognition

Edited by: Stephen Spiro¹ and Ray Dixon²

¹ Department of Molecular and Cell Biology, University of Texas at Dallas, Richardson, Texas 75083-0688, USA

² Department of Molecular Microbiology, John Innes Centre, Norwich Research Park, Norwich, NR4 7UH, UK

c. 280 pp, September 2010

ISBN 978-1-904455-69-1, \$319/£159

Bacteria have evolved extraordinary abilities to regulate aspects of their behaviour (such as gene expression) in response to signals in the intracellular and extracellular environment. Key to this are the diverse macromolecules (proteins or RNA) that sense change through direct interactions with chemical or physical stimuli. In recent years there have been tremendous advances in our understanding of the structure and function of these signal receptors, and of how interaction with the signal triggers changes in their activity and downstream events. For some systems this understanding extends to the atomic level.

In this unique book, an international team of experts reviews a selection of important model systems, providing a timely snapshot of the current state of research in the field. The book opens with an introductory chapter that reviews the diversity of signal recognition mechanisms, illustrating the breadth of the field. Subsequent chapters include descriptions of the sensing of ligands (α -ketoglutarate, adenylate energy charge, glutamine and xenobiotic compounds), chemoreceptors, iron-sulfur cluster-based sensors, metal-dependent and metal-responsive sensors, thiol-based sensors, and PDZ domains as sensors of other proteins. This book provides essential reading for everyone with an interest in sensory mechanisms, regulatory networks and responses to environmental stress in bacteria.

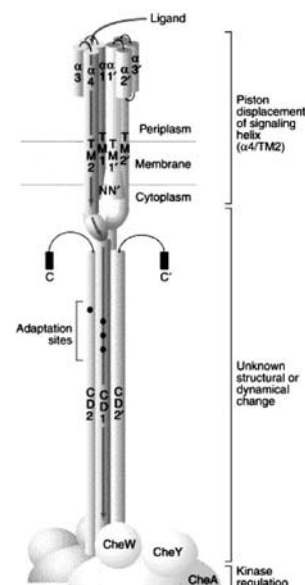


Table of Contents

- Preface. • Chapter 1: Natural history of sensor domains in bacterial signaling systems. *L. Aravind, Lakshminarayan M. Iyer and Vivek Anantharaman* • Chapter 2: Sensing ligands by periplasmic sensing histidine kinases with sensory PAS domains. *H. Kneuper, P. Scheu, M. Etzkorn, M. Sevana, P. Dünnwald, S. Becker, M. Baldus, C. Griesinger, G. Uden* • Chapter 3: Sensation of α -ketoglutarate, adenylate energy charge, and glutamine, and signal integration by the nitrogen assimilation control system of *Escherichia coli*. *Alexander J. Ninfa and Peng Jiang* • Chapter 4: Sensing xenobiotic compounds: Lessons from bacteria that face pollutants in the environment. *Víctor de Lorenzo, Rafael Silva-Rocha, Guillermo Carbajosa, Teca C. Galvão and Ildefonso Cases* • Chapter 5: Bacterial chemoreceptors as membrane-spanning allosteric enzymes. *Michael D. Manson* • Chapter 6: Iron-sulfur cluster-based sensors. *Jeffrey Green, Jason C. Crack, Adrian J. Jervis, David P. Dibden, Laura J. Smith, Andrew J. Thomson and Nick E. Le Brun* • Chapter 7: Metal-dependent and metal-responsive regulatory systems. *John D. Helmann* • Chapter 8: Thiol-based sensory factors. *Haike Antelmann and Peter Zuber* • Chapter 9: PDZ domains as sensors of other proteins. *Rebecca Kirk and Tim Clausen*

Further Details on this and all our books at

WWW.CAISTER.COM

Order from:

• ISBS, Inc., 920 NE 58th Avenue, Suite 300, Portland, OR 97213-3786, USA Tel: 503 287-3093; Fax: 503 280-8832 <http://usa.caister.com>
 • Book Systems Plus, BSP Hse, Station Road, Linton, Cambs, CB21 4NW, UK Tel: 01223 894870; Fax: 01223 894871 <http://uk.caister.com>

Quantity	Title	ISBN	Cost
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Name _____

Address _____

E-mail _____

Tel. _____ Fax. _____

Add carriage per copy:
UK £5; USA \$5.85; Rest of World please call _____

Total _____

Visa Mastercard Bill me

Exp. date [][]/[][] Security number [][][][]

Cardholder _____

Signature _____ Date _____

Two-Component Systems in Bacteria

Edited by: R Gross, D Beier
c. 410 pp, August 2012

ISBN: 978-1-908230-08-9, \$360/£180

Latest research on structure-function analysis, sensing mechanisms, atypical two-component systems, stress responses, developmental processes, virulence and symbiosis.

Foodborne & Waterborne Bacterial Pathogens

Epidemiology, Evolution and Molecular Biology

Edited by: SM Faruque
c. 330 pp, July 2012

ISBN: 978-1-908230-06-5, \$319/£159

Review topics such as pathogenic properties, population genetics, virulence genes, evolution, drug resistance, epidemiology, detection, identification and control strategies.

Yersinia

Systems Biology and Control

Edited by: E Carniel, BJ Hinnebusch
c. 240 pp, July 2012

ISBN: 978-1-908230-05-8, \$319/£159

Leading *Yersinia* researchers review the hot topics in the systems biology and control of these important bacteria.

Stress Response in Microbiology

Edited by: JM Requena
c. 500 pp, June 2012

ISBN: 978-1-908230-04-1, \$360/£180

Expert authors from around the world summarise the current knowledge on microbial stress response and comprehensively review the recent findings that have greatly advanced the understanding of stress response systems.

Bacterial Regulatory Networks

Edited by: AAM Filloux
c. 400 pp, June 2012

ISBN: 978-1-908230-03-4, \$360/£180

Authoritative, up-to-date reviews of the current research and theories on regulatory networks in bacteria. Critical reviews written by the leading research scientists in the field.

Systems Microbiology

Current Topics and Applications

Edited by: BD Robertson, BW Wren
c. 200 pp, June 2012

ISBN: 978-1-908230-02-7, \$319/£159

Cutting-edge reviews by world-leading experts on the systems biology of microorganisms. Includes theoretical approaches, mathematical modelling, case studies on microbial species and the systems analysis of microbial phenomena.

Quantitative Real-time PCR in Applied Microbiology

Edited by: M Fillion

c. 280 pp, May 2012

ISBN: 978-1-908230-01-0, \$319/£159

Aimed specifically at microbiologists, this volume describes and explains the most important aspects of current real-time quantitative PCR (qPCR) strategies, instrumentation and software.

Bacterial Spores

Current Research and Applications

Edited by: E Abel-Santos

c. 300 pp, April 2012

ISBN: 978-1-908230-00-3, \$319/£159

Comprehensive, up-to-date reviews on the current state of our knowledge of bacterial endospores. Essential text for everyone involved in spore research, the expression of recombinant proteins and pathogen detection.

Small DNA Tumour Viruses

Edited by: K Gaston

x + 324 pp, March 2012

ISBN: 978-1-904455-99-8, \$319/£159

Leading scientists from around the world review current hot-topics on small DNA tumour virus research providing a fascinating overview of their molecular biology and interactions with the host.

Extremophiles

Microbiology and Biotechnology

Edited by: RP Anitori

xiv + 300 (colour figures) pp, January 2012

ISBN: 978-1-904455-98-1, \$319/£159

Current and topical areas of extremophile research. The latest insights into the mechanisms these fascinating organisms use to survive and the most recent and novel biotechnological uses of extremophiles.

Bacillus

Cellular and Molecular Biology (2e)

Edited by: P Graumann

xii + 398 pp, February 2012

ISBN: 978-1-904455-97-4, \$360/£180

A valuable reference work providing a comprehensive and up-to-date analysis. Critical reviews on the most recent and topical research.

Microbial Biofilms

Current Research and Applications

Edited by: G Lear, GD Lewis

x + 228 pp, February 2012

ISBN: 978-1-904455-96-7, \$319/£159

An up-to-date review of the latest scientific research on microbial communities and a discussion of future trends and growth areas in biofilm-related research.

Bacterial Glycomics

Current Research, Technology and Applications

Edited by: CW Reid, SM Twine, AN Reid
x + 270 pp, February 2012

ISBN: 978-1-904455-95-0, \$319/£159

Up-to-date overview of our current understanding of bacterial glycomes, the main analytical methods and recent and novel applications.

Non-coding RNAs and Epigenetic Regulation of Gene Expression

Drivers of Natural Selection

Edited by: KV Morris

x + 216 pp, February 2012

ISBN: 978-1-904455-94-3, \$319/£159

An important and up-to-date overview of the modulation of gene transcription by non-coding RNAs. An essential reference book and a major information resource for those working in the area.

Brucella

Molecular Microbiology and

Genomics

Edited by: I López-Goñi, D O'Callaghan

x + 262 pp, February 2012

ISBN: 978-1-904455-93-6, \$319/£159

Highly acclaimed *Brucella* scientists comprehensively review the most important advances in the field. Topics include: genetic diversity, proteomic analysis, transcriptomic analysis, and much more.

Molecular Virology and Control of Flaviviruses

Edited by: P-Y Shi

x + 358 pp, January 2012

ISBN: 978-1-904455-92-9, \$360/£180

An up-to-date and cutting-edge anthology from the leading experts in the flavivirus field. Essential reading for flavivirus researchers at the graduate level and beyond.

"a valuable resource" (Doodys)

Bacterial Pathogenesis

Molecular and Cellular Mechanisms

Edited by: C Locht, M Simonet

x + 370 pp, January 2012

ISBN: 978-1-904455-91-2, \$360/£180

Distinguished scientists comprehensively describe the most relevant and up-to-date information on pathogenic features across the bacterial world.

"useful to those in many areas of research" (Doodys)