Cold-Adapted Microorganisms

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The earth is dominated by low-temperature environments including 90% of oceans and 26% of terrestrial soil ecosystems. Once thought too cold for life these environments have been shown to support diverse microbial communities. Psychrophiles use a wide variety of metabolic pathways, including photosynthesis, chemoheterotrophy and heterotrophy and form robust, diverse communities. Cold-adapted microorganisms play a major role in nutrient turnover and primary biomass production in cold ecosystems and have important applications in biotechnology and in the study of food spoilage microorganisms.

In this up-to-date book, prominent authors present cutting-edge knowledge and current concepts on cold-adapted microorganisms. Divided into three main sections the book covers the major aspects of biodiversity in cold ecosystems, the physiology and molecular adaptation mechanisms, and the various biomolecules related to cold adaptation. Individual chapters cover the various habitats and the diverse strategies employed to cope with the cold. This major new work represents a valuable source of information to all those scientists interested in cold-adapted microorganisms, extremophiles, microbial ecology and environmental microbiology.

- Chapter 1: Diversity of Bacteria in Permafrost. Shannon Hinsa-Leasure and Corien Bakermans
- Chapter 2: Ecology and Taxonomy of Psychrotolerant Bacteria in Artificial Cold Environments. Isao Yumoto and Koji Yamazaki
- Chapter 3: Psychrophilic Microorganisms in Marine Environments. Yuichi Nogi
- Chapter 4: Fungi in Cryosphere: Their Adaptation to Environments. Tamotsu Hoshino, Nan Xiao, Yuka Yajima and Oleg B. Tkachenko
- Chapter 5: Energy Metabolism in Low-temperature and Frozen Conditions in Cold-adapted Microorganisms. Pierre Amato
- Chapter 6: Proteins Involved in Cold-adaptation. Kazuaki Yoshimune, Jun Kawamoto and Tatsuo Kurihara
- Chapter 7: Heat Shock Responce in Psychrophilic Microorganisms. Seiji Yamauchi, Shinsuke Fukuda and Hidenori Hayashi
- Chapter 8: Catalysis and Protein Folding in Psychrophiles. Charles Gerday
- Chapter 9: Cold-adapted H₂O₂ Tolerant Bacteria and their Catalases. Isao Yumoto and Isao Hara
- Chapter 10: Microorganisms in Permafrost Ice Wedge and their Resuscitation Promoting Factor. Katayama Taiki and Michiko Tanaka

Other Books of Interest

- Extremophiles: Microbiology and Biotechnology
  “a solid and critical review of the impact that extremophiles have in biotechnology” (BioSpektrum (2012) 18: 224.)

- Microbial Biofilms
  Current Research and Applications
  Edited by: G Lear and GD Lewis ISBN: 978-1-904455-96-7
  “a useful update” (Micro. Today)
  “Highly recommended” (BioSpektrum)
Pathogenic Escherichia coli
Molecular and Cellular Microbiology
Edited by: S Morabito
c. 360 pp, January 2014

A timely review of the most recent molecular and cellular biology research on pathogenic E. coli. The wider perspective, including considerations on public health and the impact on animal productions.

Burkholderia
From Genomes to Function
Edited by: T Coenye, E Mahenthiralingam
c. 248 pp, February 2014

Leading international investigators review key advances in Burkholderia research to provide timely overview.

Mollicutes
Molecular Biology & Pathogenesis
Edited by: GF Browning, C Citti
c. 332 pp, January 2014
ISBN: 978-1-908230-30-0, $319/£159

Acknowledged experts critically review the most recent advances in the evolution, genetics and molecular pathogenesis of these important pathogens. An essential book for researchers working with mollicutes.

Myxobacteria
Genomics, Cellular & Molecular Biology
Edited by: Z Yang, PI Higgs
c. 240 pp, February 2014
ISBN: 978-1-908230-34-8, $319/£159

The ecology, genomics and cell biology as well as modelling and simulation on topics including motility, development and their associated genetic regulatory networks.

Next Generation Sequencing
Current Technologies & Applications
Edited by: J Xu
c. 150 pp, March 2014
ISBN: 978-1-908230-33-1, $240/£120

The most recent advances in NGS instrumentation and data analysis, current NGS platforms, sequencing chemistries, instrument specifications, general workflows and procedures.

Omics in Soil Science
Edited by: P Nannipieri, G Pietramellara, G Renella
c. 200 pp, March 2014

State-of-the-art of omic applications in soil science including the application of metagenomics, metatranscriptomics and proteomics.

Applications of Molecular Microbiological Methods
Edited by: TL Skovhus, SM Caffrey, CRJ Hubert
c. 200 pp, March 2014
ISBN: 978-1-908230-31-7, $319/£159

Emerging molecular methods that allow the diversity of a microbial community to be surveyed and its functions investigated.

Prions
Current Progress in Advanced Research
Edited by: A Sakudo, T Onodera
c. 134 pp, August 2013
ISBN: 978-1-908230-24-9, $240/£120

Renowned prion experts review the most recent advances to provide a timely and up-to-date overview of the field.

RNA Editing
Current Research & Future Trends
Edited by: S Maas
c. 240 pp, June 2013
ISBN: 978-1-908230-23-2, $319/£159

An up-to-date overview of recent findings and current frontiers in the mechanisms and functional roles of RNA editing.

Microbial Efflux Pumps
Current Research
Edited by: EW Yu, Q Zhang, MH Brown
x + 248 pp, June 2013
ISBN: 978-1-908230-21-8, $319/£159

From leading researchers in the field, this book reviews the most important current research and summarizes the most spectacular discoveries.

Cytomegaloviruses
From Molecular Pathogenesis to Intervention
Edited by: MJ Reddahese
1046 pp, April 2013
ISBN: 978-1-908230-18-8, $600/£300

Topics covered in the 46 chapters range from the systems biology omics views of the virus-host interaction to evaluating the prospects for vaccine development.

Real-Time PCR in Food Science
Edited by: BHA Rehm
x + 310 pp, February 2013
ISBN: 978-1-908230-16-4, $319/£159

“the most striking and successful approaches” Book News

Real-Time PCR Technologies and Applications
Edited by: NA Saunders, MA Lee
x + 286 pp, January 2013
ISBN: 978-1-908230-14-0, $319/£159

The latest research observations and developments in real-time PCR and detailed technical insights into the underlying principles, methods and practice of real-time PCR.

Bacterial Gene Regulation and Transcriptional Networks
Edited by: MM Babu
x + 282 pp, March 2013
ISBN: 978-1-908230-14-0, $319/£159

The latest research observations and current theories on transcriptional regulation and gene circuits in bacteria.