

# Bacterial Spores

## Current Research and Applications

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Bacterial endospores are dormant structures produced by stressed bacterial cells. Due to their intrinsic resistance endospores are perfect vehicles for causing infection. A number of endospore producing bacteria can cause diseases including tetanus, anthrax and botulism; other spore forming species have been used in biotechnological applications such as probiotics and biocides. Modern molecular studies are providing new insights into the biochemical and biophysical characteristics of spore forming bacteria that may lead to promising new applications, detection methods and therapeutics.

In this book expert authors from around the world contribute comprehensive, up-to-date reviews on the current state of our knowledge of bacterial endospores. Topics covered include: gene regulation of sporulation, fruiting body development in *Myxococcus xanthus*, sporulation in *Streptomyces*, structure and composition of the bacterial spore, mechanisms of spore survival, germination of spores, spore peptidoglycan degradation, water and cations flux during sporulation and germination, the spore as an infectious agent, heterogeneity in spore populations, detection of bacterial spores, and the expression of recombinant proteins using spores.

An essential text for everyone involved in spore research, the expression of recombinant proteins and pathogen detection, this book is also recommended for all scientists that like to keep up with cutting-edge research in microbiology and biotechnology.

**Chapter 1.** Historical Notes and Introduction to Bacterial Spores. *Mark Torred, Elias Benjelloun, Eramelle Dibala, Ernesto Abel-Santos and Christian Ross*

**Chapter 2.** Gene Regulation of Sporulation in *Bacillus subtilis*. *Eduardo A. Robleto, Holly A. Martin, Amber M. Pepper and Mario Pedraza-Reyes*

**Chapter 3.** Fruiting Body Development in *Myxococcus xanthus*: a Multicellular Developmental Program That Leads to Sporulation. *Krista M. Giglio and Anthony G. Garza*

**Chapter 4.** *Streptomyces* Sporulation. *Julia P. Swiercz and Marie A. Elliot*

**Chapter 5.** The Structure and Composition of the Outer Layers of the Bacterial Spore. *Arthur I. Aronson*

**Chapter 6.** Mechanisms of Bacterial Spore Survival. *Mario Pedraza-Reyes, Norma Ramírez-Ramírez, Luz E. Vidales-Rodríguez and Eduardo A. Robleto*

**Chapter 7.** Initiation of Germination in *Bacillus* and *Clostridium* Spores. *Graham Christie*

**Chapter 8.** Germination of *Bacillus anthracis* Spores. *Jonathan D. Giebel, Katherine A. Carr and Philip C. Hanna*

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**Chapter 12.** Heterogeneity in Bacterial Spore Populations. *Peter Setlow, Jintao Liu and James R. Faeder*

**Chapter 13.** Detection of Bacterial Spores: Prospects and Challenges. *Sainath Rao Shilpakala, Krishna Mohan V. Ketha and Chintamani D. Atreya*

**Chapter 14.** Properties and Detection Methods of Bacilli Spores in Food and in Medical Settings. *Olga Tarasenko, Pierre Alusta, Sergey Kazakov and Kalle Levon*

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