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BOOK REVIEWS

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The Bacterial Chromosome

AMS Press, American Society for Microbiology: Washington, DC, 2005. XV + 559 pages.
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The editor is affiliated with the Department of Biochemistry and Molecular Genetics and Howell Heflin Center for Human Genetics, University of Alabama at Birmingham. The list of contributors comprises 55 experts from University Departments and Centres for biochemistry, molecular biology, microbiology and related sciences, mostly from USA, and also from Canada, France, United Kingdom, Israel and Taiwan. As declared in the preface, computational science has provided some dramatic advances in analyses of complete genomes and new approaches to study chromosome dynamics in living cells. As major problems of chromosome biology and genome science there are delineated the RNA replication, the mechanism of transcription, and the homologous DNA recombination. Changing patterns of information transfer from the printed page to electronic media raise douts about how the books will be written and distributed in the future.

The volume is composed of 5 sections entitled: genetic and physical structure, replication machines, transcription machines, homologous recombination-repair machines, nonhomologous recombination. These sections encompass 29 chapters arranged into specialized paragraphs. Each chapter is concluded with a list of references mostly covering about 100 citations (in chapter 5 even 496 citations). Microbial models discussed in many chapters include bacterial cells like *Escherichia coli* (in particular), *Salmonella enterica*, *Bacillus subtilis*, *Borrelia burgdorferi*, and *Caulobacter crescentus*.

The volume is illustrated mostly by schematic line drawings delineating sequence alignments, events of cell cycles, domain structures, DA polymerase structure and mechanism of action, diagrams and models of diverse molecular and genetic processes, genetic maps, and many more. In addition, there are 10 colour plates representing pictorially cell cycle-regulated gene expression profiles, structures of RNA polymerase, holozyme crystal structure, events in transcription, and the like. Detailed tabular summaries give overviews of selected molecular and genetic data.

The Bacterial chromosome comprehensively provides access to fundamental systems required for all bacterial cells to replicate chromosomes and organize genetic information. In presented studies new experimental technologies, including the DNA microarrays, are introduced. Complex biochemical reactions, embracing DNA replication, genetic recombination, and RNA transcription, are discussed from both genetic and physical perspectives. The implications of the DNA sequence database are outlined with information on horizontal gene transfer and the impact of phage genes on bacterial genomes.

Jindřich Jíra