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| Descrizione fisica | 1 online resource (450 p.) |
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| Nota di contenuto | Dynamics of the Bacterial Chromosome; Contents; Foreword; Bacterial Species and their Abbreviation; Color Plates; 1 Structure of the Bacterial Cell; 1.1 The Cytoplasm Compartment; 1.2 The Cytoplasmic Membrane Compartment; 1.3 The Cell Wall Compartment; 1.4 The Outer Membrane Compartment; 1.5 The Periplasmic Compartment; 1.6 Extracellular Matrices; 1.7 Appendages; 2 Organization of the Bacterial Chromosome; 2.1 Structure of the Chromosomes; 2.2 Principles to Compact the Bacterial Chromosome; 2.2.1 Superhelicity; 2.2.2 Histone- like Proteins in E. coli 2.3 Organization of the Bacterial Chromosome into Genes and Repetitive Sequences2.3.1 Genes; 2.3.2 Repetitive Sequences; 2.4 Large Rearrangements Within the Chromosome; 2.4.1 Duplications; 2.4.2 Deletions; 2.4.3 Inversions; 3 The Bacterial Cell Cycle: Replication of the Chromosome, Partitioning and Cell Division; 3.1 Replication; 3.1.1 Replication of Circular Chromosomes; 3.1.2 Replication of Linear Chromosomes and Plasmids; 3.2 Partitioning (Segregation) of the Daughter Chromosomes; 3.3 Cell Division; 3.4 Plasmid- and Chromosome-encoded Toxin-Antitoxin Modules |

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| | 3.4.1 Postsegregational Killing of Plasmid-free Cells3.4.2 Chromosomal Toxin-Antitoxins; 4 Recombination; 4.1 Homologous Recombination; 4.1.1 The RecBCD Pathway of Homologous Recombination; 4.1.2 The RecF Pathway of Homologous Recombination; 4.1.3 Additional Homologous Recombination Functions; 4.1.4 Recovery of Replication at a Blocking DNA Lesion; 4.2 Sequence-specific Recombination; 4.2.1 Integration/Excision Systems; 4.2.2 Resolvase Systems; 4.2.3 Inversion Systems; 4.2.4 Shufflons; 4.2.5 Integrons; 4.2.6 Homing Endonucleases; 4.3 Illegitimate Recombination 4.3.1 Insertion Sequence Elements4.3.2 Transposons; 4.3.3 Transposing Bacteriophages; 4.3.4 Mechanisms of Transposition; 4.3.5 Conjugative and Integrative Elements; 4.3.6 Nonhomologous Endjoining (NHEJ); 5 Origin of Mutations and Repair of DNA Lesions; 5.1 Classes of Mutations; 5.2 Origin of Mutations; 5.2.1 Spontaneous Mutations; 5.2.2 Induced Mutations; 5.2.3 Detection Systems for Mutations; 5.2.4 Adaptive Mutations; 5.3.7 DNA Lesions; 5.3.1 The Methyl-mediated Mismatch Repair System; 5.3.2 Very Short Patch Repair; 5.3.3 The Nucleotide Excision Repair of OXidized Nucleotides; 5.3.6 Photoreactivation of Cyclobutane Dimers; 5.3.7 Transcription-coupled Nucleotide Excision Repair; 5.3.8 The Adaptive Response; 5.3.9 The SOS Response; 5.3.10 Replication and Repair; 5.3.11 Repair of Interstrand Crosslinks in DNA; 5.3.12 Deinococcus radiodurans; 6 Principles of Gene Regulation; 6.1 Regulation at the Level of DNA; 6.1.1 Alterations of the Structure of the DNA; 6.1.2 GATC Methylation and Gene Expression; 6.1.3 Programmed DNA Rearrangements Within the Chromosome |
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| Sommario/riassunto | This book provides an unique overview on bacterial genetics, bacterial |
| | genome projects and gene technology and its applications in biological and biomedical research and medicine. The author guides the reader up the front in research within the different fields of bacterial genetics, based mainly on results received with Escherichia coli and Bacillus subtilis. |