



DNA Replication, Recombination, and Repair: Molecular Mechanisms and Pathology

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This book is a comprehensive review of the detailed molecular mechanisms of and functional crosstalk among the replication, recombination, and repair of DNA (collectively called the "3Rs") and the related processes, with special consciousness of their biological and clinical consequences. The 3Rs are fundamental molecular mechanisms for organisms to maintain and sometimes intentionally alter genetic information. DNA replication, recombination, and repair, individually, have been important subjects of molecular biology since its emergence, but we have recently become aware that the 3Rs are actually much more intimately related to one another than we used to realize. Furthermore, the 3R research fields have been growing even more interdisciplinary, with better understanding of molecular mechanisms underlying other important processes, such as chromosome structures and functions, cell cycle and checkpoints, transcriptional and epigenetic regulation, and so on. This book comprises 7 parts and 21 chapters: Part 1 (Chapters 1–3), DNA Replication; Part 2 (Chapters 4–6), DNA Recombination; Part 3 (Chapters 7–9), DNA Repair; Part 4 (Chapters 10–13), Genome Instability and Mutagenesis; Part 5 (Chapters 14–15), Chromosome Dynamics and Functions; Part 6 (Chapters 16–18), Cell Cycle and Checkpoints; Part 7 (Chapters 19–21), Interplay with Transcription and Epigenetic Regulation. This volume should attract the great interest of graduate students, postdoctoral fellows, and senior scientists in broad research fields of basic molecular biology, not only the core 3Rs, but also the various related fields (chromosome, cell cycle, transcription, epigenetics, and similar areas). Additionally, researchers in neurological sciences, developmental biology, immunology, evolutionary biology, and many other fields will find this book valuable.

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Bibliography

- Sales Rank: #4353379 in Books
- Published on: 2016-01-22
- Original language: English
- Number of items: 1
- Dimensions: 9.47" h x 1.38" w x 6.19" l, .0 pounds
- Binding: Hardcover
- 555 pages

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Editorial Review

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