

The Dynamic Bacterial Genome

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This book provides an in-depth analysis of the mechanisms and biological consequences of genome rearrangements in bacteria. Genome rearrangements take place as a result of the actions of discrete genetic elements such as conjugative transposons, plasmids, phage, and nonconjugative transposons. Bacteria also contain systems to mediate genetic rearrangements such as the general recombination pathway and specialized endogenous recombination mechanisms. The biological effect of these rearrangements is far-reaching and impacts on bacterial virulence, antibiotic resistance, and the ability of the bacteria to avoid the attentions of the host immune system (e.g., antigenic variation). These rearrangements also provide the raw material on which natural selection can act.

Each chapter examines the mechanisms involved in genome rearrangements and the direct biological consequences of these events. Because genome rearrangements are so important in evolution, at least one of the chapters views the phenomenon from an evolutionary angle. This book provides the reader with a holistic view of genome rearrangements (i.e., studies on both the biological consequences of genome rearrangement and the mechanisms underlying these processes are presented).

This book is written by leading research workers in the field and is aimed at final-year undergraduates, postgraduate and post-doctoral workers, and established biologists.

Peter Mullany is a Reader in Molecular Microbiology at University College London. His main research interests are the molecular biology and molecular ecology of conjugative transposons. He has been at the forefront of this work for the past 10 years and has pioneered the genetic analysis of the important human pathogen *Clostridium difficile*.

Cover artwork: Reviving a collapsed replication fork by recombination. Adapted from Lusetti and Cox (2002).

Advances in Molecular and Cellular Microbiology is a series edited by researchers active in these exciting and rapidly expanding fields. Each volume focuses on a particular aspect of cellular or molecular microbiology and provides an overview of the area, as well as examines current research. This series will enable graduate students and researchers to keep up with the rapidly diversifying literature in current microbiological research.

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