

Genetics of Microbes

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Genetics of Microbes

Second Edition

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Preface

Writing a textbook on microbial genetics in about 200 pages was undoubtedly a difficult task, but I have been encouraged by the response from both students and lecturers to the first edition. The requirement for a second edition is also a measure of the need for such a book. My experience as a lecturer has shown that what is needed first is an intelligible framework which can be read in a reasonable period of time. Armed with these principles, a student can then go to reviews and the original literature with a reasonable chance of understanding the jargon and the details. Molecular genetics is now so well advanced that it is easy to lose track of the purpose of a set of experiments in the wealth of sequence data and complex interactions. I have therefore kept the same format for this edition with a well-illustrated text giving original papers, popular reviews, monographs and detailed reviews to enable the student to take the subject further as required.

I have altered the sequence of the chapters by moving a considerably revised chapter on recombinant DNA to earlier in the book. This is because the new techniques are so fundamental to our understanding of how genes are constructed, mutated, expressed, regulated and recombined. Bacterial and phage genetics, on which the new technologies depend, are also dealt with earlier and an attempt has been made to introduce the concept of reverse genetics. The major change in emphasis is the importance of molecular genetics within microbial genetics. It should not be forgotten that these techniques have applications throughout biology, medicine and agriculture and it is hoped that this edition will help people in these areas to appreciate the beauty of the systems which are being exploited so successfully.

The chapters on fungal genetics have also been expanded to include the spectacular advances in the construction of yeast plasmids and artificial chromosomes. In addition similar techniques are now being extended to the filamentous fungi with important implications for the molecular biology of eukaryotic microbes and also for the industrial manipulations of fungi. Antibiotic production by the Streptomyces is

also profiting from cloning techniques and one such advance is described in the last chapter.

I should like to thank a number of people who have made the revision of this book possible. I am very grateful to Ms Susan Elliott who has made an excellent job of new and revised diagrams and also to my daughter Judith for one of the diagrams. I am also grateful for the comments on the first edition, made over the last five years, by our own undergraduates. They clearly expressed a view when my own clarity was not of the best. I would also like to thank my daughter Ruth for allowing me to have unreasonable access to the home computer during the preparation of the manuscript. Finally I must thank my wife Margaret for her help and support during the preparation of this edition.

BWB

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