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Genetic Approaches to Microbial Pathogenicity

Edited by W. Goebel

With 47 Figures



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Preface

Important progress in the elucidation of the mechanisms influencing bacterial pathogenicity has recently been made through the introduction of modern genetic techniques. Molecular cloning allows the isolation of genes for phenotypes that epidemiological surveys have suggested play an important role in pathogenesis. The structural analysis of determinants for pathogenic traits can lead to the identification not only of the primary sequence but also of the possible secondary and tertiary structures for important virulence factors such as toxins and adhesins. From these data, the prediction of antigenic domains suitable for the development of new vaccines appears to be feasible. The regulation of virulence determinants by endogenous and exogenous factors can be more clearly understood through the functional analysis of the cloned virulence genes.

This volume surveys representative virulence properties of gram-positive and gram-negative bacteria to which the genetic approach has been successfully applied. The examples described here include important bacterial toxins (e.g., diphtheria toxin, cholera toxin, toxic shock syndrome toxin, hemolysins), adhesion structures from *E. coli* and *Neisseria gonorrhoeae*, and factors supporting iron uptake, serum resistance, and invasiveness in a variety of bacteria. Both the present state and the possible future developments of these systems are described.

W. GOEBEL

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