

Comprehensive Immunology

6

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Cellular, Molecular, and Clinical Aspects of Allergic Disorders

Edited by SUDHIR GUPTA
and ROBERT A. GOOD

Cellular, Molecular, and Clinical Aspects of Allergic Disorders

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Preface

Impressive progress has been made in the general field of immunology which has made possible new understanding and pragmatic approaches to the patient with allergic disease. Indeed, one working in the field of immunology senses a major revolution of immunobiologic thinking, much of which has relevance to the clinical practice of allergy. To the practicing allergist, pediatrician, or internist who must deal with allergic patients, the surging new information may seem confusing and bewildering. As part of our comprehensive series on modern immunobiology which aims to digest this progress, we believe it is appropriate to devote an entire volume to the fundamental principles, new knowledge, and clinical lore on which the modern practice of allergy must be based.

In the present volume we strive to bring together relevant contributions from leaders in the field of immunobiology with those whose work stands at the forefront of clinical practice. The advancing understanding has in numerous instances reached the point of clinical application, and we have tried to encompass in this volume the entire scope of modern allergy.

The cellular basis of allergic disease and the body's adjustments to allergic reaction are first considered. A chapter on basophils and mast cells deals with the morphological and functional changes and mechanisms of mediator release during reactions of immediate and delayed onset. Basophil-mediated delayed cutaneous hypersensitivity is discussed in detail. Structure and functions of eosinophils in body defense, the clean-up and control of allergic reactions, are also covered. An extensive review of phenotypic and functional properties of lymphocytes, the subpopulations of lymphocytes, and the role of these cells in the various immediate hypersensitivity disorders is included.

Antigenic determinants on several antigens that are important in clinical and experimental allergies have been reviewed. Immunoglobulin E biosynthesis and mechanisms of immunoglobulin-E-mediated hypersensitivity are discussed. The mechanisms involved in the regulation of IgE antibody formation through antigen-specific suppressor T cells, modification of allergens to make them more tolerogenic, and the potentiation of suppressor T-cell development as an approach toward effective immunotherapy are discussed.

Mediators of immediate hypersensitivity are reviewed with regard to their physicochemical characteristics, their mechanisms of generation and release, their pathophysiological effects, and the interactions of the several biologic activities

with fundamental effectors such as macrophages and inflammatory reactions. A chapter on genetics of allergy deals especially with aspects of cognitive functions important in immunity. Current knowledge of the genetics of immunity, including consideration of immune response genes, is reviewed, especially as it relates to atopic diseases.

The clinical presentation and current concepts of the pathogenesis and management of various forms of urticaria and angioedema are discussed. This book also includes reviews of the current knowledge of mechanisms of food hypersensitivity, including the role of mucosal immunity; adverse reactions to drugs which are due to immunological mechanisms; allergic reactions due to common stinging insects; and classification and pathogenesis of various forms of nasal hypersensitivity.

An extensive review of the pathogenesis and pathophysiology of bronchial asthma in the light of current understanding of the immunological, physiological, and pathological principles involved has been presented. Immunopathological features of infiltrative pulmonary diseases based on allergic mechanisms and the clinical management of these diseases are covered. Immunodeficiency disorders associated with augmented IgE synthesis, e.g., hyper-IgE syndromes, are discussed with regard to their presentation and clinical manifestations. The chapter on hypersensitivity vasculitis includes a description of immune-complex-mediated reactions and of immunohistochemical evidence of immunoglobulin and complement deposition in the lesions of the cutaneous vasculitis in man. Special emphasis has been placed on identification of antigens which contribute to these complexes.

Newer laboratory techniques and interpretations of the results obtained with them that are basic to diagnosis and management of hypersensitivity disorders have also been thoroughly covered. Finally, principles of immunological and pharmacological approaches to the management of patients with allergic diseases are discussed.

The aim of this volume is to provide a background for understanding allergic diseases of man and to present information of immediate usefulness to the clinician as well as analyses of value to investigators involved in research on allergic diseases. We hope this volume will serve as a guide for practicing allergists, a source of orientation and information for medical students, and a companion to all physicians concerned with allergy and hypersensitivity, whether they be academicians or practicing physicians.

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Chapter 17

Laboratory Diagnosis of Immediate Hypersensitivity Disorders

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