

Introduction to
Medical Immunology
Second Edition

edited by
Gabriel Virella
Jean-Michel Goust
H. Hugh Fudenberg

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Charleston, South Carolina*

MARCEL DEKKER, INC.

New York and Basel

Library of Congress Cataloging-in-Publication Data

Introduction to medical immunology / edited by Gabriel Virella, Jean-Michel Goust, H. Hugh Fudenberg. -- 2nd ed.

p. cm. -- (Immunology series ; 50)

Includes bibliographical references.

ISBN 0-8247-8229-1

I. Immunology. 2. Immunologic diseases. I. Virella, Gabriel.

II. Goust, Jean-Michel, III. Fudenberg, H. Hugh, IV. Series: Immunology series ; v. 50

[DNLM: 1. Immunity. 2. Immunologic Diseases. W1 IM53K v.50 / QW 504 I6226]

QR181.I516 1990

616.079--dc20

DNLM/DLC

for Library of Congress

89-71546

CIP

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MARCEL DEKKER INC.

270 Madison Avenue, New York, New York 10016

Current printing (last digit):

10 9 8 7 6 5 4 3 2 1

PRINTED IN THE UNITED STATES OF AMERICA

Series Introduction

The teaching of immunology to students of medicine and other health professions presents a major challenge to the educator. Immunology has emerged relatively recently as a distinct scientific discipline; for most of its century-long existence it was considered a junior partner of microbiology. Separate courses in immunology are still a rarity in the medical curriculum. Students, therefore, have in the past encountered immunology in a number of guises. Often their study of immunology dealt only with defense against infectious diseases. These limited slices of immunology conveyed to students a biased view suggesting that immunology was only an applied discipline. Students failed to perceive the full scope and import of this science of biological recognition. They did not appreciate the critical importance of self versus non-self discrimination in multicellular, metazoan life. The result is that the immune system was not seen in its proper perspective—as a primary physiological regulatory system. The student, in turn, did not grasp the central function of the immune system in health maintenance as well as in the protection from disease.

This historical anomaly relegated immunology to a subsidiary position in medical education and must be corrected by including unified courses in the medical curriculum that present immunology as a distinct biological discipline. Well-written, comprehensive, and authoritative textbooks are required for such courses. We are fortunate that a few such texts are now available. The present textbook, edited by Drs. Virella, Goust, and Fudenberg, is an outstanding exam-

ple of such a book. Written by a group of active investigators and experienced teachers, it combines the best features of a multiauthored and a tightly edited volume. Its widespread acceptance is evident from the need to prepare a second edition so soon after the first one. I believe that health science educators will find this new edition even more useful than the first.

Noel R. Rose

Foreword

The original edition of this textbook was developed over a number of years, predominantly by the immunology faculty at the Medical University of South Carolina. The editors' purpose was to compile a textbook, primarily aimed at medical students, that covered both the essential basic concepts of immunology and aspects relevant to medical practice that are usually not well developed in introductory textbooks. The general outline of the book is based on a course that has been taught for over 12 years and obviously has been extensively field-tried. In keeping with those goals, the original text was lucid and well organized and contained a variety of features (diagrams, question-and-answer sections, detailed index, etc.) that resulted in good acceptance among the intended readership. The rapid progress and expansion of knowledge in immunology over the past four years has prompted the authors to produce a significantly revised second edition. Two additional contributors, Drs. Henry C. Stevenson (National Institutes of Health) and Domingos Silveira Machado (University of Lisbon), have joined the team of authors participating in the second edition.

The valuable organizational and self-evaluation features of the original text have been carried forward into the second edition. Following a revised introductory chapter that provides an expanded overview of the field and introduces the reader to a series of important concepts that are detailed subsequently, the major revisions in the Basic Immunology section are in the following chapters: "Tissues and Cells in the Immune Response," "Major Histocompatibility Com-

plex," "Antigenicity and Immune Recognition," "Lymphocyte Ontogeny and Membrane Markers," "Cell-Mediated Immunity," and "Humoral Immune Response." In the Diagnostic Immunology section, the chapters on immunoserology and diagnostic immunochemistry as well as on the diagnostic evaluation of cell-mediated immunity have been significantly updated. In the Clinical Immunology section, the chapters covering tolerance and autoimmunity, immunosuppression and immunomodulation, transplantation immunology, tumor immunology, and immunodeficiency diseases have been revised. In addition, it is important to note that new information on vaccines ("Humoral Immune Response") and AIDS ("Immunodeficiency Diseases") has been incorporated into the second edition. Along with the new and revised information, the authors have also updated the selected bibliographies of the revised chapters, which will continue to allow interested readers to obtain further information and ultimately access the classical literature.

The second edition of this text is a major asset for medical students. Further, the authors have provided appropriate updates that will keep the text useful to beginning graduate students in immunology and continue to make it an important reference for physicians requiring a concise review of the ever evolving field of immunology.

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Preface to the Second Edition

Four years ago the first edition of *Introduction to Medical Immunology* was published, introducing a new textbook written specifically for medical students, in an attempt to achieve a very difficult balance between basic information and significant clinical concepts. In this we succeeded, at least in part, judging from the response of our students and of students from other schools in the United States and overseas. But soon it was apparent to us that the publication of an updated and revised second edition was necessary. In the first place, immunology is progressing at an astounding pace; hence the need to introduce new concepts and to revise old dogmas soon became clear. On the other hand, some chapters in the first edition fell short of our expectation, as was obvious from students' feedback. We hope to have corrected both problems in this second edition, while retaining the features that made this book so valuable for medical students. Most chapters have been carefully and extensively revised—some have been virtually rewritten—and we feel that we have significantly improved the quality of this textbook.

In preparing the second edition we were assisted by Ms. Sherry Lorenz, who helped us prepare the original manuscript, by Mr. Brooks Hart, who was responsible for all new artwork, and by our production editor, Ms. Barbara Dunleavy. The feedback and criticisms of our students had a significant impact in our revision, and we wish to recognize their collective collaboration, past and future. We also want to express our gratitude to our families, who have been patient and

supportive throughout the many years of gestation of this textbook. Dr. Noel R. Rose, as Editor-in-Chief of the Immunology Series in which this textbook has been included, has supported our undertaking since the first day; we thank him and also our publishers, Marcel Dekker, Inc., for having accepted the risk of publishing *another* immunology textbook.

Gabriel Virella, M.D., Ph.D.

Jean-Michel Goust, M.D.

H. Hugh Fudenberg, M.D.

Preface to the First Edition

The first question that will cross any immunologist's mind at this time is "Do we need another textbook of immunology?" The answer is clear to us, and it has been obvious to us for the last decade: otherwise we would not have undertaken the task of putting this together. During this period many immunology textbooks have been published, but none achieved what we believed were the ideal goals for a medically oriented textbook to be used as an introduction to the field. In our minds such a textbook should be clear, concise, and up-to-date and should present a balanced perspective of basic, clinical, and diagnostic immunology. Many textbooks achieved some of these goals, but we were unable to find one that would satisfy the needs of our medical students, residents, and interns. A successful textbook for such readers cannot be over-detailed or too research-oriented; the reader should be able to get at the major concepts without dealing with all the related details; it needs to be current, but not too controversial; it also must be written in such a way that readers perceive the relevance of the concepts for their future professional activity. We hope that through several years of collaboration, in which most of these chapters were developed as part of a syllabus for medical students, we have achieved our goal of producing a textbook which our readers will find helpful to the pursuit of their educational goals. Thinking specifically about medical students, we have added ten board-type questions with answers, explained when necessary, to each chapter. Also,

the bibliographies for each chapter are intended as sources of relevant additional readings for advanced medical students, residents, and interns.

In preparing this textbook we were assisted by many, in a variety of ways: Linda Paddock, Nancy Butler, and Michelle Dopson spent long hours on word processors, typing and revising the manuscript; Kevin McPhillips was responsible for most of the drawings and diagrams; Gail Hull and Cathy Moore assisted us with various secretarial tasks; and Carolyn King and Greg Hardigree helped us immensely with the proofs. To all of them we owe a great deal. We are also indebted to a wide array of reviewers and friends who helped us with friendly (and not so friendly) criticism in the painstaking process of polishing the manuscript to its final form. Finally, we would like to acknowledge the support of Professor Noel R. Rose, and the trust reposed in us by Marcel Dekker and Dr. Maurits Dekker, who dared to go ahead with this immense undertaking.

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I

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