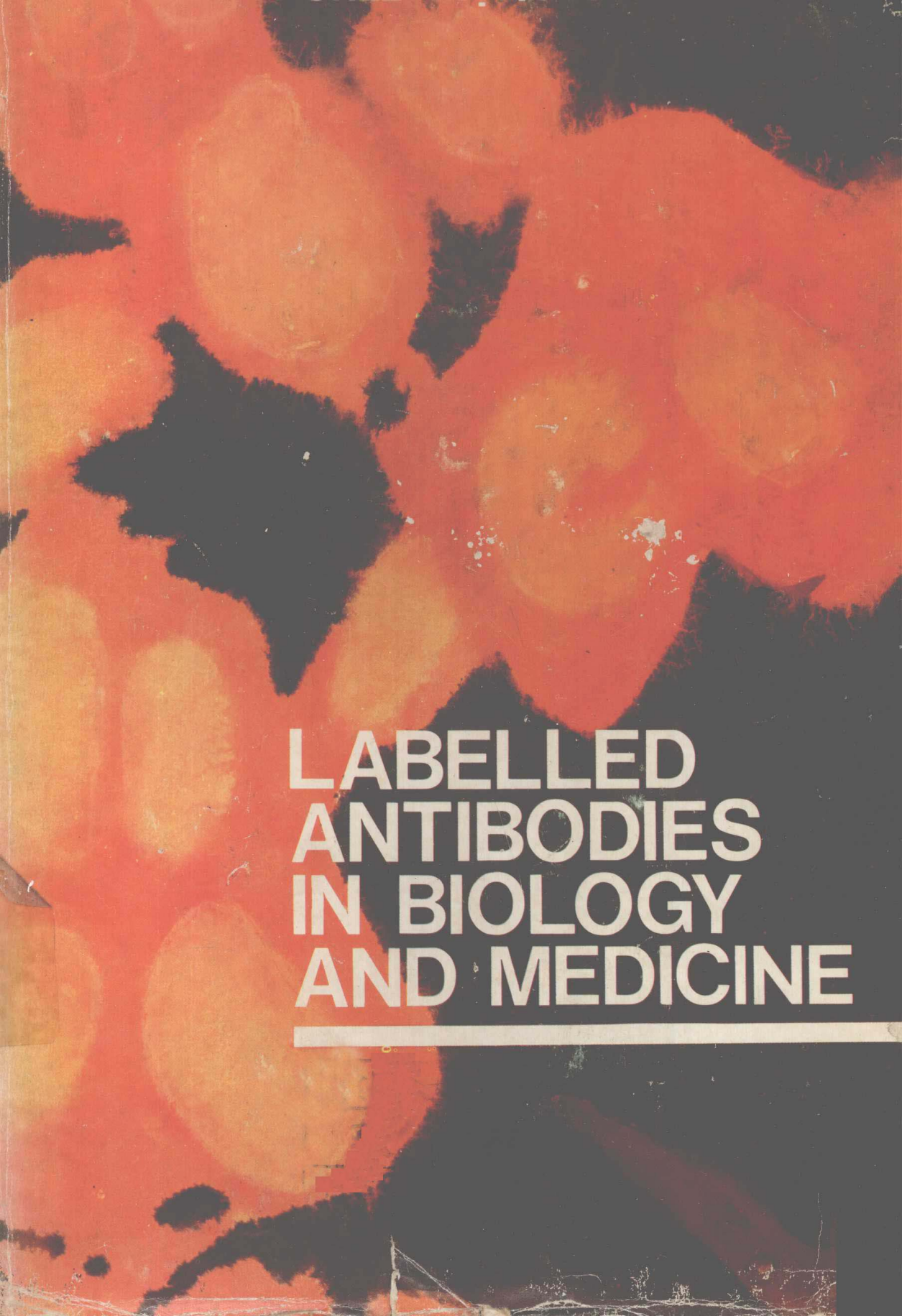
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2. SPECIAL TECHNOLOGY AND APPLICATIONS

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PREFACE

In recent years, immunology, particularly some branches, has developed at a remarkable pace. This was promoted by the introduction of highly superior techniques. With an increase in technical and material facilities many studies concerned with immunochemistry, immunohistology and immunohistochemistry have been published, for which labelled antibodies have been used. It is quite difficult at present for a specialist, but the more so for a beginner, to acquire an overall understanding of these problems. In these conditions, publication of a book presenting a synthesis in this field has become a necessity.

Having worked for many years in the fields of immunology, immunochemistry and radioimmunobiology, where I have carried out a large number of studies and acquired vast reference material, I have attempted, prompted by the suggestions and advice of specialists, to provide, in writing the present book, all those interested with a work capable of facilitating their studies and stimulating to a higher degree the application of labelled antibody techniques in various fields. In preparing this book I intended to decipher, together with my readers, the secrets of technical principles and procedures. Based on my personal experience, I have endeavoured to make a critical selection of those methods which, in my opinion, are the best and most easily adaptable to the actual conditions in our laboratories. Also, reproducing faithfully working methods employed by various authors, I have striven not to present these as dogmas, but as a guide and to allow specialists the possibility of choosing the most convenient methods and techniques, best suited to their working conditions.

In this book, I present the technologies and the applications both of fluorochrome-labelled antibodies and antibodies labelled with radioactive isotopes, ferritin and enzyme. Before making a detailed presentation of these chapters, I believed that it would be useful to give a short description of several aspects and methods concerning the preparation of antibodies, up to the labelling stage. I have laid special stress on methods for obtaining antibodies in purified form, because this is the major condition for achieving highly specific immune reactions. As is known, the coupling of an antigen with the corresponding antibody represents an affinity reaction the specificity of which depends, in the first place, on the purity of the two elements, or at least of one of them. It is also known that, when the two elements are available, one can demonstrate by and even measure each of them with its correspondent.

Working with known antibodies, one can investigate the biological circulation of some antigens and identification of tissues and cells in the structure of which such substances are components becomes possible. In contrast with classical serological methods, those using labelled antibodies enable the worker to detect antigens or structures incorporating them, both *in vivo* and *in vitro*, in tissues and cells. With the aid of labelled antibodies, particularly valuable data have been obtained concerning multiplication and localization of various micro-organisms in tissues and cells and improved knowledge has been acquired concerning mechanisms of some infections and of immune processes. It should also be mentioned that a large number of data that have been gathered in connection with some viruses have been obtained with the aid of labelled antibodies techniques.

Up to the present, antibodies have been labelled with four major categories of substances: fluorochromes, radioactive isotopes, ferritin and enzymes.

Each of these labelling methods has advantages and inconveniences, a different history of development and a certain level of application. The choice of a labelling method is determined by the aim of the investigation, as well as by technical and material conditions at one's disposal. Thus, when detection of antigens in minute amounts is attempted labelling of antibodies with radioisotopes is preferable, because it is much more sensitive than other methods. For large-volume procedures, that must be performed quickly (for instance, current diagnosis), in less well-endowed laboratories, immunofluorescence is clearly superior to other labelling methods.

Any of the four labelling methods should be applied in suitable conditions to avoid possible errors. Both technical and material conditions should be available, as well as sound experience with the methods.

Special attention has been given in the book to the fluorescent antibody techniques because these require less sophisticated laboratory hardware, making possible application in most of the laboratory departments involved in diagnostic procedures.

For a better understanding of the data presented here, as well as to provide supplementary information, I have made particular efforts to include highly representative illustrations for most of the techniques described. Interpretation of some results will be made easier by referring to these illustrations.

The author hopes that this beginner's work will be useful to most researchers in the field of biology and medicine and will represent a modest contribution to the development of these sciences.

I thank deeply some eminent specialists who, by their valuable suggestions have made a significant contribution to some of the chapters. I express my gratitude to Prof. dr. doc. N. Stamatin, Prof. dr. doc. O. Costăchel and Dr. N. St. Chișiu.

I have also received sound scientific advice from my colleagues Dr. D. Bărzoi, Dr. I. Corneci, Dr. A. Tacu and Lisetta Michailov, with whom I have had many discussions in the course of the preparation of the book. I have been greatly helped in my efforts to acquire scientific information by my colleagues Dr. D. Drăghici, Dr. N. Tuschak and Dr. P. Iorgulescu.

I thank them all and I express my gratitude.

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March 1977 *Aurel Feţeanu*

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