

Methods of Enzymatic Analysis

Third Edition

Editor-in-Chief: Hans Ulrich Bergmeyer

Editors: Jürgen Bergmeyer and Marianne Graßl

Volume IX

Proteins and Peptides

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Editorial Consultant : René F. Masseyeff



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Note

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Preface to the Series

"Methods of Enzymatic Analysis" appeared for the first time in 1962 as a one-volume treatise in German. Several updated and improved editions in English and German have been published since then. The latest English edition appeared in 1974.

In the meantime, enzymatic analysis has continued to find new applications, refinements and extensions at a pace that justifies — indeed, demands — the preparation of a new and completely revised edition. However, the field has grown so enormously that it can no longer be surveyed adequately by one person. Fortunately, therefore, I am supported in this new enterprise by Dr. M. Graßl, who is highly experienced in biochemical analysis, and Dr. J. Bergmeyer, who represents the younger generation of biochemists.

With the 1974 edition of "Methods of Enzymatic Analysis" as a starting point for our work towards the new edition, it soon became obvious that many chapters had to be eliminated, re-written or added. Moreover, the increased number of analytes that can now be determined enzymatically and of enzymes regularly requiring analysis, especially in the clinical laboratory, together with the emergence of an entirely new field of application through the technique of the enzyme-immunoassay, demanded a new arrangement and subdivision of the contents, if the vast range of material was to be dealt with properly and lucidly.

The result is the plan of the work printed on the page opposite the title page of this volume. Of course, it would be impossible to publish a whole series such as this at one moment and still maintain an equal degree of topicality for all contributions. Therefore, we decided to produce the series at a pace of several volumes per year. The volumes will not necessarily appear in their numerical order, but will be made available as they can be planned and completed.

As before, the purpose of the work is to provide reliable descriptions of well-developed procedures of enzymatic analysis in the broadest sense of the term. Special efforts are being made to arrange every chapter, and to co-ordinate the contents of all chapters, in such a way that the volumes are useful as laboratory manuals for daily work.

Internationally-agreed enzyme nomenclature as well as quantities and units correlating with the "Système International d'Unités" are used wherever possible in order to make statements and data unambiguous and comparable over time and space.

All contributions are and will be written in English: however, contributors come from all over the world and their manuscripts naturally show various versions of English. These have to be harmonized in style and spelling in order to achieve uniformity throughout the series without, we hope, entirely eliminating each author's personal approach. Professor Donald W. Moss has kindly agreed to undertake this task. We agreed with him to use modern English spelling, but to try to minimize differences between British and American practice. We hope that this will be considered

as a fair solution and one which will make the series accessible to as wide a readership as possible.

Thanks are due to the authors in the first place for responding so readily to our invitations, for writing their chapters so diligently within a short time and for communicating their experience and expertise. We are also indebted to all colleagues who gave their advice and to Professor Moss for accepting the task of language editor. Finally I wish to record my gratitude to Verlag Chemie for the fruitful and excellent co-operation during all stages from planning to production.

Tutzing, February 1983

Hans Ulrich Bergmeyer

Preface to Volume IX

This volume is devoted to methods for the determination of biologically important proteins without known enzymic activity, and of hormonal proteins and peptides. Enzyme-immunoassays are increasingly replacing radioimmunoassays for these compounds as they are easier to perform and less expensive in instrumentation, while avoiding the need to work with hazardous radioisotopes and to observe governmental regulations.

For those who are not yet fully acquainted with enzyme-immunoassays, four introductory chapters describe the principles and methods of performance that relate specially to such assays and their different philosophies of standardization, to the extent that these matters have not been dealt with in Volumes I and II.

Detailed working instructions follow. They are not as complete and detailed as in the previous volumes; partly because the performance of enzyme-immunoassays seems to be less dependent on reagent concentrations than is the case for classical enzymatic analysis, and partly because in many cases the concentration (e.g. of an antibody) is unknown and/or cannot be measured.

The methods are grouped in four parts: Transport Proteins, Carcinoembryonic and Pregnancy Proteins, Structural and Regulatory Proteins, Hormonal Proteins and Peptides. After long discussions, the editors decided not to include methods for protein sequencing. The reasons are similar to those outlined in the Preface to Volume VII: we understand "Enzymatic Analysis" to consist of methods for the determination (in special cases for the detection) of analytes rather than for pre-analytical steps.

As in the preceding volumes, all chapters have been written by experts in their fields, to whom the editors are most grateful. A joint effort by the authors, the editors and the editorial consultant has achieved presentations which in format and uniformity approach those of the "classical" volumes (cf. Preface to Volume VIII). Nevertheless, much remains to be done in the field of enzyme-immunoassays to improve standardization of practice and of the format in which the methods and their results are presented, throughout the many disciplines that use enzyme-immunoassays. The introduction of uniform schemes for the presentation of immunological reactions helps to make the principles of the various methods more transparent for the inexperienced user. Of course, we are aware that these schemes do not show the binding of antibodies to specific epitopes, as would be desirable.

In some cases it may be questionable whether a chapter belongs to the present Volume, rather than to Volume X. In particular, some analytes included with "Structural and Regulatory Proteins" could equally appropriately have been placed with "Antigens and Antibodies in Allergic and Autoimmune Diseases" in Volume X. Our decisions of placement follow the most frequent application of a method in practice.

We are indebted to Professor R. Masseyeff, the editorial consultant of this Volume, for enjoyable co-operation. He developed the structure of Volumes IX to XI. Thanks are also due to the staff of the publisher's production department for continued fruitfulness and flexible collaboration.

Tutzing, November 1985

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