

Methods of Enzymatic Analysis

Third Edition

Editor-in-Chief: Hans Ulrich Bergmeyer

Editors: Jürgen Bergmeyer and Marianne Graßl

Volume V

Enzymes 3: Peptidases, Proteinases
and Their Inhibitors

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Volume VI

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Editorial Consultant: Hans Fritz



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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 V

In the editors' opinion, this volume is one of the most exciting in the series. No other section of enzymology has expanded to such a degree as the field of peptidases, proteinases and their inhibitors. Ten years ago, 132 pages were enough to present this area comprehensively. Today, an entire volume of 558 pages is needed. Developments in biochemistry, clinical chemistry and chemical pathology have been especially fruitful in this field.

Not only have the mechanisms of action of the well-known hydrolases and their inhibitors been elucidated, but also the stages of the blood coagulation cascade have become more and more clear. The functional characteristics of the components and the mechanisms of their activation are described in this volume. Convenient methods for the determination of the factors are now available and are set out in the format well-tried for other methods.

The most up-to-date view of the complement system is also presented. The classical and alternative pathways as well as the activation and inactivation mechanisms of the 19 known serum proteins which take part are described in an introductory chapter. The complement cascade of reactions in blood and its role in host defence is one of the most exciting fields of biological science today. Therefore, this fast-growing subject had to be included in this volume, although we are well aware that research is still only at the beginning of what promises to be a further phase of development.

Six method descriptions for the complement system are presented, although procedures in this new field are obviously not as settled as would be necessary in order to fulfil completely the requirements of compatibility of laboratory results over space and time (cf. Vol. I, chapter 1.3, p. 40). In a sense, therefore, these methods represent a departure from the principle of describing only well-proved methods suitable for routine work. However, it is hoped that this part of volume V will contribute to the further development and simplification of these and related methods, making them more convenient and thus facilitating their use in the routine laboratory for the benefit of patients.

The editors are indebted to many colleagues for numerous hints and fruitful discussions, especially to Prof. Hans Fritz who acted as an editorial consultant, and to Prof. Donald W. Moss for his continuous and very helpful work as language editor.

With this volume, the first half of the series is completed; this is an appropriate moment, therefore, for me to express my sincere thanks to all reviewers of the first four volumes for their kind reviews and constructive criticisms.

Tutzing, April 1984

Hans Ulrich Bergmeyer

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