

## Analytical Uses of Immobilized Biological Compounds for Detection, Medical and Industrial Uses

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# Analytical Uses of Immobilized Biological Compounds for Detection, Medical and Industrial Uses

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D. Reidel Publishing Company

Dordrecht / Boston / Lancaster / Tokyo

Published in cooperation with NATO Scientific Affairs Division

Proceedings of the NATO Advanced Research Workshop on  
Analytical Uses of Immobilized Biological Compounds  
for Detection, Medical and Industrial Uses  
Florence, Italy  
May 4-8, 1987

Library of Congress Cataloging in Publication Data

**NATO Advanced Workshop on Analytical Uses of Immobilized Biological Compounds for Detection,  
Medical, and Industrial Uses (1987: Florence, Italy)**

Analytical uses of immobilized biological compounds for detection, medical, and industrial uses /  
edited by George G. Guilbault and Marco Mascini.

p. cm. — (NATO ASI series. Series C, Mathematical and physical sciences; vol. 226)

"Proceedings of the NATO Advanced Research Workshop on Analytical Uses of Immobilized  
Biological Compounds for Detection, Medical, and Industrial Uses, Florence, Italy, May 4-8, 1987"—  
T.p. verso.

"Published in cooperation with NATO Scientific Affairs Division."

Includes index.

ISBN-13: 978-94-010-7804-7

e-ISBN-13: 978-94-009-2895-4

DOI:10.1007/ 978-94-009-2895-4

1. Biochemistry—Technique—Congresses. 2. Immobilized enzymes—Congresses.  
3. Immobilized proteins—Congresses. 4. Biosensors—Congresses. I. Guilbault, George G.  
II. Mascini, Marco. III. North Atlantic Treaty Organization. Scientific Affairs Division.  
IV. Title. V. Series: NATO ASI series. Series C, Mathematical and physical sciences; no. 226.  
QP519.7.N38 1987  
660'.63 — dc 19

87-32076

CIP

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Published by D. Reidel Publishing Company  
P.O. Box 17, 3300 AA Dordrecht, Holland

Sold and distributed in the U.S.A. and Canada  
by Kluwer Academic Publishers,  
101 Philip Drive, Norwell, MA 02061, U.S.A.

In all other countries, sold and distributed  
by Kluwer Academic Publishers Group,  
P.O. Box 322, 3300 AH Dordrecht, Holland

D. Reidel Publishing Company is a member of the Kluwer Academic Publishers Group

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**Softcover reprint of the hardcover 1st edition 1988**

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## **DEDICATION**

**To Susan and Mareza**

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## **PREFACE**

On May 4-8, 1987, a NATO Advanced Research Workshop on the Analytical Uses of Immobilized Biological Compounds was held in Florence, Italy. The Director of the Workshop was Professor George G. Guilbault of the University of New Orleans, and the Co-Director was Professor Marco Mascini of the University of Florence

**It was the purpose of this meeting to assemble scientists from all NATO Countries with an interest in immobilized biological compounds, to discuss**

- methods of immobilization
- properties of immobilized compounds
- enzyme electrodes and biosensors
- optical devices utilizing immobilized enzymes
- microbial sensors and clinical uses of immobilized enzymes
- flow injection analysis using enzymes
- immobilized biological compounds in chemical defense detection
- pharmaceutical analysis
- uses in industrial analysis
- enzyme reactors
- air pollution detectors
- immunosensors
- medical uses and applications
- solid state and FET sensors

**Goals to be achieved by the conference were**

- to permit an exchange of views and experience in all these areas
- to review and critically assess the state-of-the-art in these fields
- to set guidelines for future research and establish collaborative projects between scientists in NATO laboratories in the above areas.

Thirty-seven lectures were given by 36 speakers in all of the above areas. Sessions were devoted to (1) methods and properties of immobilized enzymes (2) clinical and pharmaceutical analysis (3) enzyme, bio- and microbial sensors, (4) defense applications, (5) solid state/FET devices, (6) optrodes and spectroscopic applications, (7) immunosensors, (8) flow injection analysis, and (9) industrial and analytical applications. Finally, two hours were devoted to an open discussion of future status, new directions and joint projects.

This book is a publication of most of the lectures given at this workshop.

We wish to thank for their financial support of this conference: Cassa di Risparmio di Firenze, Eli Lilly (Indianapolis), Esacontrol SpA (Genova), Instrumentation Laboratory (Milano), Universal Sensors (New Orleans), Università degli Studi di Firenze and especially NATO for the ARW grant that made the Conference possible. We also thank our organizing committee (Drs. Coulet, Patriarche, Campanella and Palleschi) for the organization and local support, and D. Moscone, R. Pillotan and S. Salleri for providing the secretarial services that made the Conference run smoothly. Finally, the typing support of Mrs. Gayle Barlow is gratefully acknowledged.

## CONCLUSIONS

In the last afternoon, a round table discussion of selected speakers (see program), the Directors and audience centered on the status of the field of Analytical Uses of Immobilized Biological Compounds, cooperation between labs and the future.

Several participants expressed appreciation to the Conference for the possibility to meet and develop contacts with scientists of other NATO countries doing similar research. Collaborative projects were established between (1) the Universities of Rome, Florence and New Orleans on NAD/NADH dependent dehydrogenases, modified electrodes and immobilization techniques for substrates of clinical interest, (2) the University of Porto in Portugal and Barcelona in Spain in new electrodes for whole blood flow analysis, (3) U. S. Defense Labs in Edgewood, Md. and the University of Rouen in France on Receptor Electrodes, (4) University of Brussels, Belgium, and New Orleans on New Methods for Artificial Sweeteners and Carbohydrates, (5) University of Cincinnati and University of Lund on Modified Electrodes, and (6) Technical University of Denmark and University of New Orleans on Flow Injection Analysis of Artificial Sweeteners.

Discussion on new areas was devoted to (1) Receptor Electrodes and Methods for use in Defense and Analysis (2) Modified Electrodes as better analytical methods (3) Miniaturized solid state (FET type electrodes) for the sensors of the future (4) Immobilized Enzymes in Medical Shunts (5) Enzyme Immunoassay and Immuno Probes and (6) Optrodes - now finally getting established.

Because of the highly productive nature of the Conference, it was decided to have a second NATO Conference in 1990.

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