METHODS IN RADIOIMMUNOASSAY OF PEPTIDE HORMONES

Reprinted from Methods in Investigative and Diagnostic Endocrinology, Volumes 2A and 2B, edited by Solomon A. Berson (deceased) and Rosalyn S. Yalow, 1973

Compiled by

ROSALYN S. YALOW

METHODS IN RADIOIMMUNOASSAY OF PEPTIDE HORMONES

Reprinted from Methods in Investigative and Diagnostic Endocrinology, Volumes 2A and 2B, edited by Solomon A. Berson (deceased) and Rosalyn S. Yalow, 1973

Compiled by

ROSALYN S. YALOW

Veterans Administration Hospital, Bronx, N.Y., 10468, U.S.A.

馆藏专用章

1976
NORTH-HOLLAND PUBLISHING COMPANY, AMSTERDAM – OXFORD
AMERICAN ELSEVIER PUBLISHING COMPANY, INC., NEW YORK

© North-Holland Publishing Company – 1976

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior permission of the copyright owner.

North-Holland ISBN : 0 7204 0630 7
American Elsevier ISBN : 0 444 11205 7

PUBLISHERS:

NORTH-HOLLAND PUBLISHING COMPANY – AMSTERDAM
NORTH-HOLLAND PUBLISHING COMPANY, LTD. – LONDON

SOLE DISTRIBUTORS FOR THE U.S.A. AND CANADA:

AMERICAN ELSEVIER PUBLISHING COMPANY, INC.
52 VANDERBILT AVENUE, NEW YORK, N.Y. 10017

Library of Congress Cataloging in Publication Data

Methods in radioimmunoassay of peptide hormones.

Selections from Peptide hormones.
"Reprinted from Methods in investigative and diagnostic endocrinology, volumes 2A and 2B."
Includes bibliographical references.
1. Peptide hormones--Analysis--Addresses, essays, lectures. 2. Radioimmunoassay--Addresses, essays, lectures. I. Yalow, Rosalyn Sussman, 1921- II. Title. [DNLM: 1. Radioimmunoassay--Methods--Collected works. 2. Hormones--Analysis--Collected works. 3. Peptides--Analysis--Collected works. QY330 M5923]
QP572.P4B472 1976 615'.36 76-25818
ISBN 0-444-11205-7

Printed in The Netherlands

Preface

The preface to Volume 2 of METHODS IN INVESTIGATIVE AND DIAGNOSTIC ENDOCRINOLOGY described the seminal role of radioimmunoassay in our understanding of hormonal physiology. It stated,

> "The development of radioimmunoassay and the studies in understanding of hormonal physiology during the late 1950s and the 1960s coincided with a period of great advances in the chemistry of peptide hormones. It was during this time that highly purified preparations of most of the known peptide hormones became available to investigators. That hormones could be obtained which were sufficiently pure for labeling and in adequate supply for immunization was an essential element in the development of radioimmunoassay techniques. In turn, radioimmunoassay provided the sensitivity, specificity and reliability that made possible studies of in vivo hormonal regulation, which would otherwise not have been possible. The synergistic interaction between advances in the biochemistry of peptide hormones and in investigations in physiology, particularly those using radioimmunoassay, has resulted in an information explosion. However, the rate of increase in this field appears to be slowing down and now is an appropriate time to pause and bring together a compendium of the varied methodology and interpretation involved in the interwoven biochemical, physiologic and clinical studies relating to the peptide hormones."

Since the completion of that volume in 1972 there have been relatively few significant changes in radioimmunoassay methodology for the peptide hormones described therein. There has, however, been an enormous increase in the applicability of radioimmunoassay to other peptides and to hundreds of other substances of biologic interest. The problems, practices and pitfalls of radioimmunoassay presented in that volume, both in the general chapters and in those devoted to particular hormones, should prove to be of value not only to the investigators and others employing the described procedures but also to all concerned with developing new assays for any substance and for improving those already in use. It therefore seemed

worthwhile to extract from the original volume the relevant chapters on radioimmunoassay and to republish them in a format which it is hoped will be helpful and convenient for laboratory use.

Rosalyn S. YALOW
November 1975

此为试读,需要完整PDF请访问: www.ertongbook.com

List of contributors

Austen, K. Frank
Department of Medicine, Robert Breck Brigham Hospital, Boston, Mass. 02120, U.S.A.

Bagshawe, K.D.
Edgar Laboratory, Charing Cross (Fulham) Hospital, London, England

Beardwell, Colin
National Institute of Arthritis, Metabolic and Digestive Diseases, NIH, Bethesda, Md. 20014, U.S.A.

Berson, Solomon A. (deceased)
Senior Medical Investigator, Veterans Administration Hospital, Bronx, N.Y. 10468, and Department of Medicine, Mount Sinai School of Medicine of CUNY, New York, N.Y. 10029, U.S.A.

Bryant, Gillian D.
Department of Biochemistry and Biophysics, University of Hawaii, Honolulu, Hawaii 96822, U.S.A.

Catt, Kevin J.
National Institute of Child Health and Human Development, NIH, Bethesda, Md. 20014, U.S.A.

Chrétien, Michel
Protein and Polypeptide Hormones Laboratory, Clinical Research Institute of Montreal, Montreal, Canada

Cotes, P. Mary
Division of Biological Standards, National Institute for Medical Research, Holly Hill, London, England

Faloona, Gerald R.
Department of Internal Medicine, University of Texas Southwestern Medical School and Veterans Administration Hospital, Dallas, Tex. 75216, U.S.A.

Franchimont Paul
Departmen of Internal Medicine and Pathology Institute of Medicine, University of Liège. Liège, Belgium

Friesen, H.
Department of Experimental Medicine, McGill University Clinic, Royal Victoria Hospital, Montreal, Canada

Glick, Seymour M.
Department of Medicine, State University of New York, Downstate Medical Center, Brooklyn, N.Y. 11235, U.S.A.

Goodfriend, Theodore L.
Department of Pharmacology, University of Wisconsin School of Medicine, Madison, Wis. 53706, U.S.A.

Gorden, Phillip
National Institute of Arthritis, Metabolic and Digestive Diseases, NIH, Bethesda, Md. 20014, U.S.A.

Greenwood, Frederick C.
Department of Biochemistry and Biophysics, University of Hawaii, Honolulu, Hawaii 96822, U.S.A.

Grumbach, M.M.
Department of Pediatrics, University of California School of Medicine, San Francisco, Calif. 94122, U.S.A.

Guyda, H.
Department of Experimental Medicine, McGill University Clinic, Royal Victoria Hospital, Montreal, Canada

Haber, Edgar
Department of Medicine, Massachusetts General Hospital, Harvard Medical School, Boston, Mass. 02116, U.S.A.

Hwang, P.
Department of Experimental Medicine, McGill University Clinic, Royal Victoria Hospital, Montreal, Canada

Island, Donald P.
Department of Medicine, Vanderbilt University School of Medicine, Nashville, Tenn. 37203, U.S.A.

Kaplan, S.L.
Department of Pediatrics, University of California School of Medicine, San Francisco, Calif. 94122, U.S.A.

Klein, Lester A.
National Institute of Arthritis, Metabolic and Digestive Diseases, NIH, Bethesda, Md. 20014, U.S.A.

Lefkowitz, Robert J.
Department of Medicine, Harvard Medical School, Massachusetts General Hospital, Boston, Mass. 02114, U.S.A.

Odell, W.D.
Division of Endocrinology, Harbor General Hospital, Torrance, Calif., U.S.A.

Pastan, Ira
National Institute of Arthritis, Metabolic and Digestive Diseases, NIH, Bethesda, Md. 20014, U.S.A.

Petersen, M.J.
National Institute of Arthritis, Metabolic and Digestive Diseases, NIH, Bethesda, Md. 20014, U.S.A.

Robertson, Gary L.
National Institute of Arthritis, Metabolic and Digestive Diseases, NIH, Bethesda, Md. 20014, U.S.A.

Rosen, Saul W.
National Institute of Arthritis, Metabolic and Digestive Diseases, NIH, Bethesda, Md. 20014, U.S.A.

Roth, Jesse
National Institute of Arthritis, Metabolic and Digestive Diseases, NIH, Bethesda, Md. 20014, U.S.A.

Samols, Ellis
Nuclear Medicine Department, Veterans Administration Hospital, Louisville, Ky. 40206, U.S.A.

Talamo, Richard C.
Department of Medicine, Massachusetss General Hospital, Harvard Medical School, Boston, Mass. 02116, U.S.A.

Tashjian, Armen H., Jr.
Pharmacology Department, Harvard School of Medicine, Boston, Mass. 02116, U.S.A.

Utiger, R.D.
Department of Medicine, University of Pennsylvania School of Medicine, Philadelphia, Pa. 19104, U.S.A.

Vinik, A.
Department of Pediatrics, University of California School of Medicine, San Francisco, Calif. 94122, U.S.A.

Weintraub, Bruce D.
National Institute of Arthritis, Metabolic and Digestive Diseases, NIH, Bethesda, Md. 20014, U.S.A.

Yalow, Rosalyn S.
Senior Medical Investigator, Veterans Administration Hospital, Bronx, N.Y. 10468, and Department of Medicine, Mount Sinai School of Medicine of CUNY, New York, N.Y. 10029, U.S.A.

Young, John D. (deceased)
St. Vincent's Hospital, Sydney, N.S.W., Australia

Contents

此为试读,需要完整PDF请访问: www.ertongbook.com

CHAPTER 1

General methodology*

by Solomon A. Berson and Rosalyn S. Yalow

1.1 PRINCIPLE

The basis of the radioimmunoassay method is the competitive inhibition by unlabeled hormone of binding of labeled hormone to its specific antibody (Yalow and Berson 1959) according to the competing reactions shown in fig. 1.

Here, F and B represent concentrations of free and antibody-bound *labeled* hormone, respectively. The *fractions* of the labeled hormone which are bound and free

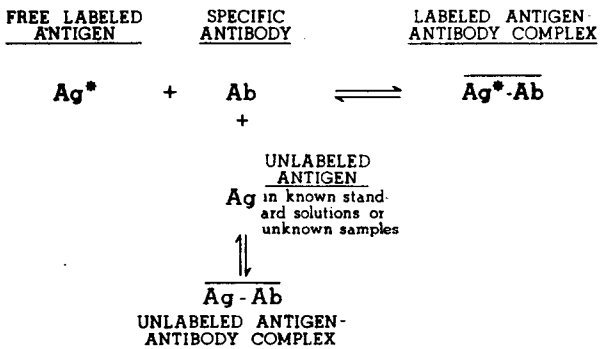

Fig. 1. Competing reactions that form the basis of the radioimmunoassay.

* Standard hormone preparations are available from the Hormone Distribution Officer, Office of the Director, National Institute of Arthritis and Metabolic Diseases, National Institutes of Health, Bethesda, Md. 20014 (A list of available preparations is published at least once a year in Endocrinology and in J. Clin. Endocrinol. Metab.) and from the United Kingdom Medical Research Council, Division of Biologic Standards, National Institute for Medical Research, Hampstead Laboratories, Holly Hill, London NW3 6RB, England. When standard reference preparations cannot be obtained, the use of crude glandular extracts or plasma containing a high hormone concentration permits evaluation of relative concentrations of hormone in unknown samples.

此为试读,需要完整PDF请访问: www.ertongbook.com