

Radionuclides in Nephrology

**Proceedings of the IIIrd International
Symposium Berlin, April 1974**

Edited by

**Karl zum Winkel, M. Donald Blaufox
and Jean-Louis Funck-Brentano**

Associate Editors

David I. Goldsmith and Sebastian Lange

205 Figures, 91 Tables

Radionuclides in Nephrology

Proceedings of the IIIrd International Symposium
Berlin, April 1974

Edited by
Karl zum Winkel, M. Donald Blaufox
and Jean-Louis Funck-Brentano

Associate Editors
David I. Goldsmith and Sebastian Lange

205 Figures, 91 Tables



Georg Thieme Publishers Stuttgart 1975

CIP-Kurztitelaufnahme der Deutschen Bibliothek

Radionuclides in nephrology : proceedings of the
IIIrd Internat. Symposium Berlin, April 1974 /

ed. by Karl zum Winkel [u.a.]

ISBN 3-13-521301-3

NE: ZumWinkel, Karl [Hrsg.]

Some of the product names, patents and registered designs referred to are in fact registered trademarks or proprietary names even though specific reference to this fact is not always made in the text. Therefore, the appearance of a name without designation as proprietary is not to be construed as a representation by the publisher that it is in the public domain.

All rights, including the rights of publication, distribution and sales, as well as the right to translation, are reserved. No part of this work covered by the copyrights hereon may be reproduced or copied in any form or by any means – graphic, electronic or mechanical including photocopying, recording, taping, or information and retrieval systems – without written permission of the publisher.

© 1975 Georg Thieme Publishers, D-7000 Stuttgart 1, Herdweg 63, P.O.B. 732

Printed in Germany by Franz Pistotnik, Gerlingen

ISBN 3-13-521301-3

Preface

The IIIrd International Symposium Radionuclides in Nephrology was held in Berlin on April, 1.-3. 1974 under the sponsorship of the Ministerium für Forschung und Technologie of the Federal Republic of Germany. This meeting was attended by 130 participants from 18 different nations and was organized by Dr. Karl zum Winkel (Germany) the chairman of the scientific committee, which included Dr. M. Blafox (USA), Dr. J.-L. Funck-Brentano (France), Dr. A. Joeke (Great Britain), Dr. T. Minami (Japan), Dr. O. Munck (Denmark) and Dr. R. Nagel (Germany).

The first international meeting devoted to Radionuclides in Nephrology was held in Liege, Belgium (1968).

The continued interest in this subject of research and clinical application led to the second meeting in New York City (USA, 1971) and warrants periodic international meeting of scientists working in this area.

Many types of inquiry in clinical and basic sciences are important for the maintenance and development of sound standards for the use of radionuclides in nephrology. Therefore, the program of the meeting covered a wide range of topics: Renal blood flow, Functional and morphological studies, Radioimmunoassay, Renal transplantation, Renal handling of radioactive compounds, Metabolic studies in renal disease and Clearance determinations.

During the last decade nuclear medicine has been the fortunate recipient of the benefits of a rapidly improving technology and impressive progress in biochemical methodology. The overwhelming variety of methods presently used in kidney research was demonstrated at the symposium. The techniques included electron microscopy, kidney microdissection, radioimmunoassay, autoradiography, ultrasonography, clearance determinations, kinetic analysis of radiopharmaceuticals and computational data processing.

We all look forward to the further progress which will be reviewed at the next Symposium 1977 in Boston (USA) under the chairmanship of Dr. N. Hollenberg and the co-chairmanship of Dr. O. Munck. We hope, that the proceedings of the Symposium will be useful to scientists and physicians who did not have the opportunity to come to Berlin, and that they will promote the understanding of this exciting field. We are indebted to all of the contributors to the symposium. Their promptness and cooperation have made it possible to complete this text within a short time.

We would also like to thank Dr. h.c. G. Hauff, Georg Thieme Verlag, who has helped to make this publication possible.

The Editors *Karl zum Winkel*
M. Donald Blafox
J.-L. Funck-Brentano

Editors

Karl zum Winkel, M.D.

Professor für Klinische Radiologie, Direktor des Strahleninstitutes der Freien Universität Berlin im Klinikum Charlottenburg

M. Donald Blaufox, M.D., Ph. D.

Associate Professor of Medicine and Radiology, Albert Einstein College of Medicine; Director, Division of Nuclear Medicine, Albert Einstein College of Medicine; Attending Physician, Bronx Municipal Hospital Center, Bronx, New York

Jean-Louis Funck-Brentano, M.D.

Professeur à la Faculté de Médecine, Necker-Enfants-Malades, Paris, France; Directeur de l'Unité de Recherches sur l'Application des Radio-éléments à l'Etude des Maladies Métaboliques, INSERM, U 90, Paris, France

Associate Editors

David I. Goldsmith, M.D., Assistant Professor of Pediatrics, Division of Pediatric Nephrology, Albert Einstein College of Medicine, Bronx, New York

Sebastian Lange, M.D.

Assistenzprofessor, Strahleninstitut der Freien Universität Berlin im Klinikum Charlottenburg

Acknowledgments

This symposium was sponsored by the Ministerium für Forschung und Technologie der Bundesrepublik Deutschland.

Further grants were given by the following organizations:

Amersham Buchler, Braunschweig; Bayer, Leverkusen; Boehringer, Mannheim; BYK Gulden, Konstanz; BYK Mallinckrodt, Dietzenbach-Steinberg; Farbwerke Hoechst, Frankfurt; Grünenthal, Stolberg; Dr. Madaus, Köln; C.H.F. Müller, Hamburg; Schering, Berlin; Siemens, Erlangen; Dr. Thomae, Biberach.

Participants

Austria

Dienstl, Elisabeth, Allg. Öffentl. Krankenhaus, Nuklearmedizinisches Labor,
4020 Linz/Donau, Krankenhausstr. 9

Erd, Werner, 2nd Medical University Clinic, 1090 Vienna, Garnisongasse 13

Pohl, Landeskrankenhaus Salzburg

Belgium

Mahieu, Philippe, Hôpital de Bavière, 66, B^d. de la Constitution, 4000 Liège,
Université de Liège

Petit, René, Hôpital de Bavière, Urologie, 66, B^d. Constitution, 4000 Liège,
Université de Liège

Piepsz, Amnon, University of Brussels, 148, Av. des Traquets, 1150 Bruxelles

Schoutens, André, Hôpital Brugmann, 4, Place van Gehuchten, 1020 Bruxelles

Timmermans, Leopold, Université de Liège, 196 R. Général Jacques, Vaux,
Chévreumont B 4601

van Vaerenbergh, Maurits, Oude Vierschaarstraat 18, 9831 Deurle

Verhas, Michel, Hôpital Brugmann, Dépt. Isotopes, Place van Gehuchten,
Bruxelles

Willems, Jacqueline, Hôpital Bavière, 66, B^d. de la Constitution, 4000 Liège,
Université de Liège

Bulgaria

Andreew, Ignat, Nephrologische Klinik der Med. Akademie, Sofia, Straße Ilia
Filipossni 4

Canada

Carriere, Serge, University of Montreal, Montreal

Denmark

Brøchner-Mortensen, Jens, Department of Clinical Physiology, Aalborg Sygehus Syd,
9000 Aalborg

Kristiansen, Jan Hardan, Pilevej 37, Korup, University Hospital, Odense

Ladefoged, Jørgen, Rigshospital AFD. P, Blegdamsve 9, 2100 Copenhagen

Munck, Ole, Dept. Clinical Physiology, Glostrup Hospital, 2600 Glostrup

Ølgaard, Klaus, Rigshospitalet, Med. Dept. P, Blegdamsve 9, 2100 Copenhagen

Tønnesen, Knud Henrik, Glostrup Hospital, 10 Nyhavn, 1051 Copenhagen

VI

France

- Bankir, Lise*, INSERM U 90 Hôpital Necker, 161 Rue des Sèvres, 75015 Paris
- Barjon, Paul*, Cliniques St. Charles, 34059 Montpellier Cedex
- Chanard, Jacques*, Hôpital, Necker, Département de Néphrologie, 161 Rue de Sèvres, 75015 Paris
- Devynck, Marie*, Hôpital Necker, Pharmacologie et Physiologie, INSERM U 7, 161 Rue de Sèvres, Paris
- Drüeke, Tilman*, Hôpital Necker, Département de Néphrologie, 161 Rue de Sèvres, Paris
- Fressinaud, Philippe*, Hôpital Necker, INSERM, 17 Rue du Fer à Moulin, 75014 Paris
- Funck-Brentano, Jean-Louis*, Hôpital Necker, 161 Rue de Sèvres, Paris
- Grünfeld, Jean-Pierre*, Clinique Néphrologique, Hôpital Necker, 161 Rue de Sèvres, Paris 15
- Osborne-Pellegrin, Mary*, Hôpital Necker, INSERM U 7, Physiologie et Pharmacologie, 161 Rue de Sèvres, Paris 15^e
- Perrine, Donald*, Intertechnique, St. Nom la Breteche
- Raynaud, C.*, C.E.A. 91406 Orsay Commissariat à l'Energie Atomique Département de Biologie Service Hospitalier Frédéric Joliot
- de Rouffignac, Christian*, Commissariat à l'Energie Atomique, Département de Biologie—L.P.P.C., Centre d'Etudes Nucléaires de Saclay, BPu02 — Gif sur Yvette, 81
- Sabto, Joseph*, Hôpital Necker, Clinique Néphrologique, 161 Rue de Sèvres, Paris 15^e
- Sraer, Josée*, INSERM Unit, Hôpital Tenon, 4 Rue de la Chine, Paris 20^e

Germany

- Albert, Jens-Peter*, Institut für klinische und experimentelle Nuklearmedizin der Universität Bonn, 53 Bonn 1, Venusberg
- Baethke, Reinhard*, Klinikum Westend der FU Berlin, Berlin 19, Spandauer Damm 130
- Bahlmann, J.*, Institut für Nuklearmedizin und Spezielle Biophysik, Med. Hochschule, 3 Hannover, Karl-Wiechert-Allee 9
- Beuerlein, Ingrid*, Allgemeines Krankenhaus Harburg, 2104 Hamburg 92, Fritz-Döhling-Weg 3c
- Bohle, Adalbert*, Pathologisches Institut der Universität, 74 Tübingen
- Botsch, Hanno*, Radiologische Abteilung, Klinikum Steglitz, 1 Berlin 45, Hindenburgdamm 30
- Breuel, Hans-Peter*, Medizinische Universitäts-Klinik, 34 Göttingen
- Endon, Hitoshi*, Pharmakologisches Institut der FU Berlin, 1 Berlin 33, Taubertstr. 33A
- Ewe, Sigurd*, Nuklearmedizinische Abteilung, Krankenhaus Spandau-Nord, 1 Berlin 20, Lynarstr. 12
- Grebe, Siegfried*, Univers. Dep. of Nuclear Medicine, 63 Gießen, Friedrichstr. 27

- Hast, Björn*, Klinik und Poliklinik für Radiologie der Universität München, 8 München 2, Ziemssenstr. 1
- Heidenreich, Peter*, Nuklearmedizinische Klinik rechts der Isar, 8 München 80, Ismaninger Str. 20
- Heinze, Hans Georg*, Klinik und Poliklinik für Radiologie der Universität, München 2, Ziemssenstr. 1
- Helmchen, Udo*, Pathologisches Institut der Universität, 74 Tübingen
- Hierholzer, Klaus*, Dept. of Clinical Physiology, Freie Universität Berlin, Klinikum Steglitz, 1 Berlin 45, Hindenburgdamm 30
- Höft, Karl*, Fa. Elscint GmbH, 62 Wiesbaden-Schierstein, Freudenbergstr. 27
- Hör, Gustav*, Nuklearmedizinische Klinik der Technischen Universität, 8 München 80, Ismaninger Str. 22
- Hünermann, Bernd*, Institut für Nuklearmedizin Bonn, 505 Porz, Westhoven, Rheinaustr. 5
- Jost, Heidemarie*, Strahlenklinik und Poliklinik der Freien Universität Berlin, Klinikum Westend, 1 Berlin 19, Spandauer Damm 130
- Kessel, Michael*, Medizinische Universitäts-Klinik, Klinikum Westend, 1 Berlin 19, Spandauer Damm 130
- Koszik, Friedrich*, Fa. von Heyden GmbH München, 8031 Geiselbullach, Schmidtstr. 65
- Kracht, Heinz*, Urologische Abteilung, Friednherstift, 3 Hannover, Gustav-Adolf-Str. 22
- Kretschko, Julius*, Nuklearmedizinische Klinik und Poliklinik rechts der Isar der Technischen Universität, 8 München 80, Ismaninger Str. 22
- Lange, Sebastian*, Strahlenklinik der Freien Universität, 1 Berlin 19, Spandauer Damm 130, Klinikum Westend
- Leisner, Bernhard*, Klinik und Poliklinik für Radiologie der Universität, 8 München, Ziemssenstr. 1
- Lorenz, Kurt*, Fa. Picker Roentgen, 3001 Hannover-Wettbergen
- Lotz, Werner*, Abteilung für Radiologie der Universität, 51 Aachen
- Mariss, Peter*, Institut für Nuklearmedizin, 3 Hannover, Karl-Wiechert-Allee 9
- Möhring, K.*, Urologische Universitätsklinik, 69 Heidelberg, Kirschnerstr. 1
- Nagel, Reinhard*, Urologische Klinik der Freien Universität Berlin, Klinikum Westend, 1 Berlin 19, Spandauer Damm 130
- Nörenberg, Hans-Joachim*, Städt. Krankenhaus Heckeshorn, 1 Berlin 39, Am Großen Wannsee 80
- Oeff, Karl*, Nuklearmedizinische Abteilung der FU Berlin, Klinikum Steglitz, 1 Berlin 45, Hindenburgdamm 30
- von der Ohe, Marianne*, Fa. Farbwerke Hoechst, Med. Abteilung, 6202 Wiesbaden-Biebrich, Biebricher Allee 112
- Peters, Peter E.*, Radiologische Universitätsklinik, 44 Münster
- Petersen, Friedrich*, Allgemeines Krankenhaus St. Georg, Abteilung für Nuklearmedizin, 2 Hamburg 1, Lohmüllerstr. 5

VIII

- Pfeifer, Klaus Jürgen*, Klinik und Poliklinik für Radiologie der Universität München, 8 München 70, Wadlerstr. 8
- Pixberg, Hans-Ulrich*, Deutsche Klinik für Diagnostik, 62 Wiesbaden
- Ritz, Eberhard*, Med. Universitätsklinik, 69 Heidelberg, Ludolph-Krehl-Klinik, Bergheimer Str.
- Rohloff, Ralf*, Universität München, Klinik und Poliklinik für Radiologie, 8 München 80, Bayrischzeller Str. 21
- Siebenmorgen, Hans*, Fa. Picker Roentgen GmbH, 4992 Espelkamp, Schillerstr. 10
- Sonderkamp, Horst M.*, Kreiskrankenhaus, 224 Heide
- Sorge, Franco*, Klinikum Westend der Freien Universität Berlin, 1 Berlin 19, Spandauer Damm 130
- Schneider, Albert*, Städt. Krankenhaus München-Neuperlach, Nuklearmedizinische Abteilung, 8023 Pullach, Seitnerstr. 4a
- Schröter, Hans*, Fa. R. Karl Thomae Biberach, 795 Biberach, Bachstr. 22
- Schurek, Hans-Joachim*, Medizinische Klinik der Freien Universität Berlin, Klinikum Steglitz, 1 Berlin 45, Hindenburgdamm 30
- Schwarzendorfer, Astrid*, Nuklearmedizinische Klinik und Poliklinik der Technischen Universität München, 8 München 80, Ismaninger Str. 22
- Teebken, Klaus*, Klinik Dr. Hancken, Nuklearmedizinische Abteilung, 216 Stade, Lönsweg 7
- Trüber, Henno*, Strahlenklinik der Freien Universität, 1 Berlin 19, Spandauer Damm 130, Klinikum Westend
- Uhlich, Eike*, II. Med. Univ.-Klinik, 8 München
- Vogel, Jürgen*, Fa. Byk-Mallinckrodt, Dietzenbach
- Weber, Hans-Joachim*, Freie Universität Berlin
- Werner, Eckhard*, Gesellschaft für Strahlen- und Umweltforschung, 6 Frankfurt 70, Paul-Ehrlich-Str. 20
- Zieger, Karl*, Städt. Krankenhaus Spandau-Nord, Nuklearmedizinische Abteilung, 1 Berlin 20, Lynarstr. 12
- zum Winkel, Karl*, Strahlenklinik der Freien Universität, 1 Berlin 19, Spandauer Damm 130, Klinikum Westend

Great Britain

- Blacklock, Norman*, Royal Naval Hospital, Haslar, Gosport, Hampshire
- Britton, Keith*, Institute of Nuclear Medicine, Middlesex Hospital, 64 Fortis Green, London N 29 EN
- Constable, Anthony R.*, St. Paul's Hospital, Endell Street, London W.C. 2
- Joekes, Mark*, St. Peter's Hospitals, St. Philip's Hospital, Sheffield Street, London, W.C. 2

Macleod, Murdoch A., Dept. Nuclear Medicine, Royal Naval Hospital, Haslar, Gosport
Reeve, Jonathan, MRC. Clinical Research Centre, Radioisotopes Division, Watford
 Road, Harrow, Middlesex HA 1 3 nJ

Italy

Bianchi, Claudio, Clinica Medica Generale, University of Pisa
Semprebene, L., 11th Clinica Chirurgica-Medica, University of Rome School of
 Medicine

Israel

Drukker, Alfred, Shaarei Ledek Med. Center, Jerusalem, Jaffa Road

Japan

Fukuchi, Soitsu, Department of Internal Medicine, Tohoku University School of
 Medicine, 3-4-36 Kitayama, Sendai
Minami, Takeshi, Jikei University School of Medicine, Department of Urology,
 Nishishinbashi Minato-Ku, Tokyo
Miyazaki, Mizuo, Dept. of Pharmacology, Osaka City Univ. Medical School,
 9-2 Machiura, Abeno, Osaka
Tanaka, Akira, National Institute of Hygienic Sciences, Department of Medical
 Chemistry, 1-18-1, Kamiyoga, Setagaya, Tokyo

Mexico

Alvarez, Jorge, Instituto Nacional de Energia Nuclear, Hospital "20 de Noviembre",
 Providencia 1229, Mexico 12
Maass, Roberto, Instituto Nacional de Energia Nuclear, Ajusco 61, Col. Alpes,
 Mexico 20

Netherlands

Donker, Albert, Academisch Ziekenhuis, Afd. Interne Geneeskunde, Oostersingel 59,
 Groningen
Oei, Hong Yoe, Academic Hospital Utrecht, Dept. of Nuclear Medicine, Catharyne-
 singel 101, Utrecht
Schnurman, Hans, Oostersingel 59, Groningen, Isotopen Laboratorium, Academisch
 Ziekenhuis
van Stekelenburg, Louis H.M., Radiologisch Dienst TNO, Avenhem
Tegzess, Adam, Dept. of Internal Medicine, University Hospital, Oostersingel 59,
 Groningen

Norway

Falch, Dagfinn, Alcer Hospital, Vestlegon 32, Oslo 9

X

Norman, Nils, Aker Hospital, Hormone and Isotope, Dr. Smiths vei 14, Oslo

Rootwelt, Ksell, Rikshospitalet, University Hospital, Oslo

Sweden

Magnusson, Gösta, The Department of Nephrology, St. Erika Hospital, Stockholm

Switzerland

Bischof-Delaloye, Angelika, Hôpital Cantonal Universitaire, Div. Aut. de Médecine Nucléaire, 1011 Lausanne

Jucker, Armin, Kantonsspital, 8200 Schaffhausen, Gemsgasse 9

Locher, Johannes, Kantonsspital, Nuklearmedizinische Abteilung, 4000 Basel

Skenderovic, Alois, Perollès 1, Fribourg

United States of America

Blaufox, M. Donald, Albert Einstein College of Medicine, 1300 Morris Park Avenue, Bronx, N.Y. 10461

Blight, Edward M., 2nd General Hospital, APO, New York 09180

Goldberg, Marvin, University of Minnesota, Health Sciences Center, 5049 Abbott Ave., Box 382, Minneapolis, Minn. 55410

Goldsmith, David, National Naval Med. Center, Bethesda Md., 3010 Wisconsin Ave., Washington, D.C. 70016

Gruskin, Alan, St. Christopher's Hospital for Children, 7600 N. Lawrence Street, Philadelphia Pa. 19133

Handmaker, Hirsch, Children's Hospital of San Francisco, 2616 Buchanan Street, San Francisco, Ca. 94115

Hayes, M., Division of Nuclear Medicine, Los Angeles, County Harbor Gen. Hospital Torrance, California

Hollenberg, Norman K., Harvard Medical School, 721 Huntington Avenue, Boston, Mass. 0214

MacIntyre, William J., Cleveland Clinic Center, 9500 Euclid Ave., Cleveland, Ohio 44106

Katz, Murray, Univ. Arizona College of Medicine, Tucson, Arizona

Kirschenbaum, Michael A., Ohio State University Hospital, 1075 Merrimarr Circle Columbus, Ohio 43220

Moser, Lawrence, Dept. of Nuclear Medicine, Intercommunity Hospital, 215 W. College, Covina, Calif. 91723

Pinter, Gabriel G., Dept. of Physiology, University of Maryland, 660 W. Redwood Street, Baltimore, Maryland 21201

Ponto, Richard A., Dept. of Radiology, University of Minnesota Hospital, Minneapolis, Minnesota 55455

Schlegel, Jorgen, Tulane Medical School, New Orleans, 1430 Tulane Avenue

Wedeen, Richard, Jersey City Medical Center, New Jersey, Medical School, 574 S.
Forest Dr., Teaneck, N.Y.

Yugoslavia

Gorkic, Daroslava, 11000 Beograd, Mutapova 51/I

Contents

Preface	III
Participants	V
Part I Renal Blood Flow	1
<i>L. Bankir, C. de Rouffignac, J.P. Grünfeld, J. Sabto, J.-L. Funck-Brentano</i> Single Glomerular Blood Flow and Single Nephron Glomerular Filtration Rate in the Hydropenic Rabbit Kidney	2
<i>M.D. Blafox, H.B. Lee, D. Milstein</i> Renal Blood Flow Distribution in the Rat During Intraarterial Infusion of Vasoactive Agents	9
<i>M. Miyazaki, Y. Abe, K. Yamamoto, and J.L. McNay</i> Comparative Study of Several Vasodilators in Glomerular Filtration Rate and Renal Blood Flow	13
<i>J.H. Stein, M.A. Kirschenbaum, N. White, and T.F. Ferris</i> Studies on the Distribution of Renal Cortical Blood Flow During Renal Vasodilatation	18
<i>J.P. Bonvalet, C. de Rouffignac, S. Carriere, D. Chabardes and F. Morel</i> Flow Rate - Volume Interrelationship along the Nephron Determined with ^{14}C Na Ferrocyanide	23
<i>G.G. Pinter, C.C.C. O'Morchoe and J.L. Atkins</i> Quantitative Measurement of Total Renal Lymph Drainage. An Experimental Tracer Study in Dogs	29
<i>M.A. Katz, E. Wroblewski, and L. Shear</i> Failure to Demonstrate an Influence of Altered Intrarenal Blood Flow Distribution on Renal Sodium Handling in Acute Thoracic Inferior Vena Caval Obstruction	33
<i>A. Mimran, N.K. Hollenberg, P. Barjon, and J.P. Merrill</i> Renal Hemodynamics in Chronic Salt Restriction: Evidence for the Role of the Renin-Angiotensin System	39
<i>D.I. Goldsmith, A. Drukker, A. Spitzer, M.D. Blafox, and C.M. Edelman, Jr.</i> Response of the Neonatal Canine Kidney to Acute Saline Expansion	45
<i>A.B. Gruskin, V.H. Auerbach, and I.F.S. Black</i> Clinical Assessment of Renal Blood Flow in Children Using ^{133}Xe on. Changes due to Congenital Heart Disease, Angiocardigraphy, and Heart Failure	51
<i>P. Heidenreich, M. Oberdorfer, G. Hör, K. Kempken, and H.W. Pabst</i> Estimation of Renal Blood Flow by Means of Technetium-99m and Xenon-133	58
Part II Functional and Morphological Studies	67
<i>K.E. Britton, J.R. Corfield, M.M. Buhm</i> The Measurement of Individual Renal Function	68

<i>R.E. Maass, R.E. Perez, and R.C. Montesinos</i> Determination of Renal Mean Transit Time with Electronic Data Processing Equipment	72
<i>K.H. Tønnesen, O. Munck, T. Hald, P. Mogensen and H. Wolf</i> Influence on the Radiorenogram of Variation in Skin to Kidney Distance and the Clinical Importance Hereof	79
<i>W.J. MacIntyre, S. Bagheri, A. Rodriguez-Antunes, T.W. Hunter, S.A. Cook</i> Evaluation of Perfusion, Filtration, and Excretion of the Kidney Using ^{99m}Tc - DTPA and Sequential Scintillation Camera Scanning	86
<i>A.J. Bueschen, Blackwell B. Evans, and J.U. Schlegel</i> Renal Function Evaluation in Children by Scintillation Camera Study	93
<i>S. Lange, R. Nagel, K. zum Winkel, J. Lange, and Th. Newiger</i> Classification of Impaired Renal Evacuation by Sequential Scintigraphy ..	97
<i>L. Timmermans</i> A Comparison of Radioisotopic and Ultrasonic Scanning of the kidney	101
Part III Radioimmunoassay	107
<i>A. Drukker, Hyo-Bok Lee, C.M. Edelman Jr. and M.D. Blaufox</i> Radioimmunoassay of Plasma Renin Activity in Small and Neonatal Animals normal Values, Developmental Patterns and Response to Acute Intravenous Saline Load	108
<i>S. Fukuchi, K. Nakajima, Y. Michimata and S. Tsuchida</i> The Interrelation of Plasma Vasopressin and Plasma Renin Activity Measured by Radioimmunoassay	114
<i>M.J. Osborne, B. Droz, P. Meyer and F. Morel</i> Renal Localization of Tritiated Angiotensin II in Mesangial Cells by Radioautography	119
<i>M.A. Devynck, M.G. Pernollet and P. Meyer</i> Membraneous and Solubilized Angiotensin Receptors in Rabbit Aorta	124
<i>N.K. Hollenberg, and G.H. Williams</i> The Vascular and Adrenal Receptor for Angiotensin II: Evidence for a Functional Difference	129
<i>J. Sraer, Nadine Loreau, C. Piamba and R. Ardaillou</i> Receptors for Calcitonin and Calcitonin Sensitive Adenylate Cyclase in Rat Renal Cellular Membranes	138
<i>F. Sorge, R. Baethke, J.M. Meier and M. Kessel, Berlin</i> Growth Hormone in Chronic Renal Failure: Some Considerations Concerning the Disorders of its Secretory Regulation	145
<i>P. Mahieu and J. Foidart-Willems</i> Detection of Anti-Glomerular Basement Membrane Antibodies by a Radioimmunological Technique	150
<i>Ph. Fressinaud, R. Ardaillou, J. Drouet, J. Menard and P. Corvol</i> Monoiodinated Peptides: Preparation and Interest for Radioimmunoassays and Biological Studies	156

<i>K. Ølgaard and J. Ladefoged</i> Measurement of Plasma-Aldosterone in a Control Group, Patients with Addison's Disease and in Patients with Chronic Renal Failure on Regular Intermittent Hemodialysis	159
Part IV Renal Transplantation	165
<i>L.E. Williams, L.H. Toledo-Pereyra, M.E. Goldberg, R.A. Ponto, M.K. Loken and J.S. Najarian</i> Assessment of Perfusion of Excised Canine Kidneys by Radionuclide Angiography	166
<i>J.-P. Albert, L. Weissbach, and A. Morakis</i> Radioisotopes Procedures for the Evaluation of Hypothermic Perfusion-Preserved Kidneys	171
<i>G. Magnusson, L. Collste and G. Lundgren</i> The Usefulness of the Immediate Posttransplant ¹³¹ I-Hippuran Renogram in the Evaluation of the Ischemic Damage Inflicted to the Graft	174
<i>A.M. Joeke, A.R. Constable, and B.E.B. Hyne</i> Renogram Monitoring of Kidney Transplant Rejection	181
<i>L. Semprebene, Rita Massa, C. Casciani, and F. Benedetti Valentini jr.</i> Radioisotope Investigations of the Renal Transplant in Man	189
<i>J. Sabto, J.-F. Moreau, J.-P. Grünfeld</i> Renal Hemodynamics and Renin Release in Homotransplanted Patients	192
<i>K.J. Pfeifer, K.R. Schmidt, G. Seyffart, B. Leisner, H.G. Heinze</i> Follow-up Studies of Transplanted Kidneys with ¹³¹ I-Hippuran and ¹³³ Xenon	200
<i>M. Hayes, T.C. Moore, and G.V. Taplin</i> Radionuclide Evaluation of Renal Transplant Status	207
<i>G.S. Freedman, M. Schiff, and H. Handmaker</i> Radionuclide Evaluation of Renal Transplants	212
Part V Renal Handling of Radioactive Compounds	217
<i>R.P. Wedeen</i> Renal Autoradiography: In Vitro Studies of Concentrative Transport	218
<i>H. Botsch, R. Sörensen, G. Schwarz</i> Studies on the Extraction Ratio of Labeled o-Iodohippurate in Man with regard to Radioactivity in Plasma and Red Blood Cells	222
<i>K. zum Winkel, and H. Jost</i> Intrarenal Kinetics of Radiopharmaceuticals applied to the Artery	225
<i>C. Raynaud, S. Ricard, D. Comar</i> ¹⁹⁹ Tl Uptake on the Medulla of the Kidney in Man	232
<i>T. Minami, T. Machida, M. Miki, Y. Ohishi and H. Irikura</i> Renal Imaging with ^{99m} Tc-Penicillamine Acetazolamide Complex	239
<i>J. Alvarez, R. Maass, C. Arriaga</i> Kidney Imaging with a New ^{99m} Tc-Radiopharmaceutical	244
<i>A. Tanaka, T. Minami, T. Machida and M. Miki</i> Studies on New Renal Scanning Agents	249

Part VI Metabolic Studies in Renal Diseases	255
<i>E. Ritz, J. Bommer, B. Krempien, O. Mehls</i> Cartilage Growth in Experimental Uremia	256
<i>M.A. Macleod, M.J. Blacklock</i> The Application of an External Isotope Counting Technique in the Measurement of Calcium Absorption in Urolithiasis	260
<i>J. Chanard, T. Drüecke, J. Zingraff, C. Elizalde-Monteverde, J.L. Funck-Brentano</i> Fractional Intestinal Absorption of Calcium in Chronic Renal Failure. A Reappraisal with a New Test	266
<i>E. Werner, P.B. Bechstein, W. Fassbinder, J.P. Kaltwasser, W.D. Patyna, K.M. Koch</i> The Intestinal Absorption of Iron in Chronic Renal Failure	275
Part VII Clearance Determinations	281
<i>K. Hierholzer</i> Remarks of the Chairman	282
<i>J. Bahlmann, I. Beuerlein, G. Just, V. Klement, P. Mariss</i> A Comparison of Various Methods for the Estimation of the Glomerular Filtration Rate	283
<i>J. Brøchner-Mortensen, J. Haahr, J. Christoffersen, J.O. Lund</i> Simplified Single Injection Methods for Accurate Assessment of the Glomerular Filtration Rate in Children and Adults	289
<i>G. Hör, P. Heidenreich, J. Kretschko, A. Schwarzenborfer, K. Kempken, H. Göger, H.W. Pabst, H. Kriegel</i> Simultaneous Application of Radiopharmaceuticals to Determine Glomerular and Tubular Function Using Different Clearance Technique, Including Divided Renal Clearance	294
<i>B. Hünemann, L. Weissbach, C. Winkler</i> Significance of EPA-Correction in Individual Renal Radiohippurate Clearance Determination	298
<i>R.A. Ponto, J.T. Payne, M.E. Goldberg, M.K. Loken</i> Dual Isotope Renal Clearance Studies using a Scintillation Camera	302
<i>K. Möhring, P. Georgi, L. Röhl, H. Sinn</i> Simultaneous Split Measurement of Glomerular Filtration Rate (GFR) and Effective Renal Plasma Flow (ERPF) by ^{111}In -DTPA and ^{131}I -Orthoiodo- hippurate-Infusions Clearance Following Initial Double-Isotope Scintigraphy	309
<i>H.U. Pixberg, W. Henne, P. Pfannenstiel</i> A Simple Method for the Determination of Unilateral Effective Renal Plasma Flow	315
<i>J. Reeve, J.C.W. Crawley, S.M. Hamilton, A.D. Goldberg</i> Deconvolution Analysis of the Standard Renogram and its Clinical Application	321
Index	326

Part I

Renal Blood Flow

In this first of 7 sections basic and clinical informations concerning renal blood flow are presented. The interest of many authors is directed toward intrarenal blood flow distribution, which can be assessed with radionuclide labelled microspheres. Renal blood flow and its intrarenal distribution were examined under the influence of various factors, including vasoactive pharmaceuticals, hormones and alterations of extracellular volume and sodium homeostasis. Kidney lymph drainage measured with I-131-plasma albumin, has also proven to be susceptible to study.