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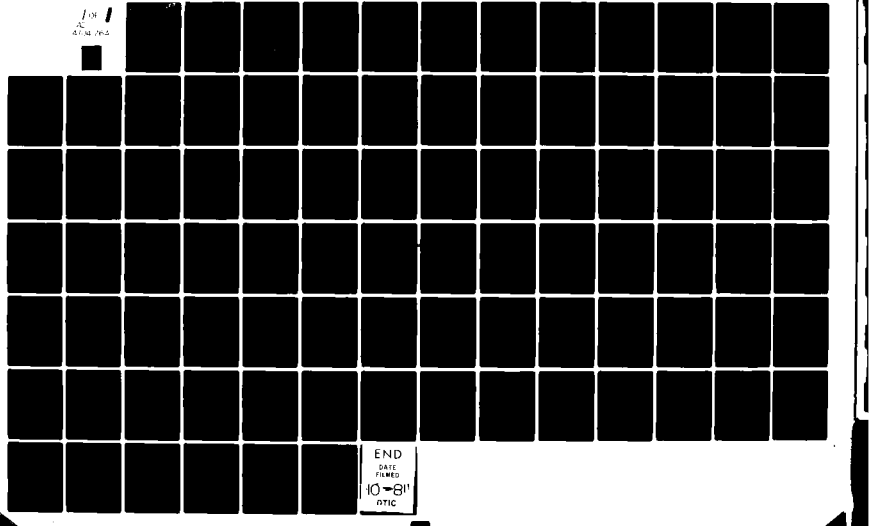

EVALUATION OF SHORT-TERM BIOASSAYS TO PREDICT FUNCTIONAL IMPAIRMENT

DEVELOPMENT OF RENAL BIOASSAYS IN LABORATORY ANIMALS

DIRECTORY OF INSTITUTIONS/INDIVIDUALS
Final Report

Purna Greenaway, Awadh Singh

October 1980

Supported by
US Army Medical Research and Development Command
Fort Detrick, Frederick, Maryland 21701

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The MITRE Corporation
1820 Dolley Madison Boulevard
McLean, Virginia 22102

Contracting Officer's Technical Representative: Mary C. Henry, Ph.D.
US Army Medical Bioengineering Research and Development Laboratory
Fort Detrick, Maryland 21701

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Renal toxicity	Tubular function	Toxic substances
Directory	Biochemical damage indicators	
Research organizations	Renal hemodynamics	
Morphological measurements	Test systems utilized	
Glomerular function	Compounds tested	

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

MITRE has been requested by the U.S. Army Medical Bioengineering Research and Development Laboratory to identify and evaluate short-term bioassays which have demonstrated ability to evaluate and predict renal impairment resulting from toxicant exposures. This directory is a companion to Selected Short-Term Renal Toxicity Tests, which describes the available renal testing protocols and assesses their suitability for a screening program. This directory catalogues the organizations currently engaged in renal bioassay utilization or development and provides information concerning

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

specific measurements performed, test systems employed, compounds tested, requirements for anesthesia and terminal nature of the test.

The companion report to this directory reviews the literature on test procedures for determining effects on the kidneys and other components of the renal system. The procedures are discussed in sections on morphology, glomerular function, tubular function, intrarenal hemodynamics, and biochemistry. Criteria for evaluating these procedures are given, and a two-tiered testing system is recommended for a chemical renal toxicity screening program.

EXECUTIVE SUMMARY

The MITRE Corporation, Metrek Division is currently assisting the United States Army Medical Bioengineering Research and Development Laboratory (USAMBRDL) in the development of a hierarchical short-term testing scheme to screen substances for functional or morphological impairment in animal test systems. Effects in four organ systems--pulmonary, hepatic, renal and cardiovascular--are being considered.

As part of this effort, Metrek has been asked to prepare directories of organizations and individuals presently involved in the development and/or utilization of tests applicable to toxicity screening. This directory serves as a companion document to the report, Evaluation of Short-Term Bioassays to Predict Functional Impairment: Selected Short-Term Renal Toxicity Tests, which presents information on the available tests for the renal system and recommends those tests which are suitable for use in a screening program.

Entries in each directory for several organizations currently involved in the organ bioassay use or development include at least one contact individual's name, which appears under the organization name and address at the top of the page. These are the people who, during the process of directory compilation, described either their activities or the activities of their group regarding organ toxicity testing, and thereby provided the information presented in the entry.

The information provided includes the specific tests and observations performed; the test systems utilized (e.g., experimental animals or tissues in vitro); the substances administered or conditions established to elicit toxic response (e.g., stress); the use of anesthesia, and the terminal nature of the tests conducted.

In order to facilitate use and the processes of amending and adding to the directory, it has been arranged in alphabetical order by organization. In order to further simplify use of the directory, three indexes have been prepared and are included as appendices. The first, Appendix A, is an alphabetical index of tests performed by each organization engaged in developing, performing or refining the tests noted. Appendix B is an alphabetical index of species utilized and all the organizations employing each test system. These are further divided by tests performed. In this way it is possible to ascertain which organizations perform particular bioassays in a specific test system. Appendix C is an alphabetical index of the individuals mentioned in the directory, and the organization with which they were affiliated when contacted.

The objective of this directory is to provide a readily usable guide to that segment of the scientific community currently active in organ system toxicity testing in animals. Because research associate and graduate student positions are often temporary in nature, a deliberate attempt was made to exclude these individuals from the directory. Their efforts, however, are likely to be

represented by activities associated with their organization, as in most cases these individuals are conducting research under the auspices of someone more senior and more permanently allied with the organization, who was included in the directory. In addition, there are individuals who were active in toxicity testing at one time but are no longer; these have also been omitted from the directory. The efforts of many of those who are not currently active, but were involved over a period of many years and distinguished themselves in the fields, are reflected in the report Selected Short-Term Renal Toxicity Tests.

Some of the entries in the directory may be less detailed than others, and less specific in the detail that is presented. In addition, the information presented for an organization may not be reflective of all the ongoing efforts at the organization. This is due largely to the reluctance of some individuals contacted to communicate the information and, in small part, to an inability to contact a few individuals at the time this directory was being compiled. The information in the directory was selected to provide an immediate indication of the practices of each organization concerning some issues of importance when designing a screening program. Much of this information is discussed in greater detail in the report Selected Short-Term Renal Toxicity Tests.

FOREWORD

This Directory was compiled by MITRE staff by means of a survey of the recent literature, and by discussions with leaders in the field and other personal contacts. We are grateful to all those who responded so patiently to our questions regarding their activities. All of the "contact persons" were given an opportunity to review the information relating to their organization. We recognize there may be inadvertent omissions for which we offer our sincere apologies.

Citations of organizations and trade names in this report do not constitute an *official Department of the Army endorsement* or approval of the products or services of these organizations.

TABLE OF CONTENTS

DIRECTORY OF ORGANIZATIONS PRESENTLY INVOLVED IN UTILIZATION OR DEVELOPMENT OF RENAL TESTS IN LABORATORY ANIMALS

ORGANIZATION:

BAYLOR COLLEGE OF MEDICINE
TEXAS MEDICAL CENTER
HOUSTON, TEXAS 77030

J. R. MITCHELL
PROFESSOR OF MEDICINE
G. CORCORAN
RESEARCH ASSISTANT PROFESSOR
(713) 790-4721

TESTS PERFORMED:

MORPHOLOGICAL MEASUREMENT: LIGHT MICROSCOPY
TUBULAR FUNCTION:
- SECRETIVE TEST
  - IN VITRO EVALUATION OF RENAL TRANSPORT (CORTICAL SLICE TECHNIQUE)

RENAL HEMODYNAMICS: RENAL BLOOD FLOW MEASUREMENT
BIOCHEMICAL DAMAGE INDICATORS:
- DRUG METABOLIC STUDIES
- RENAL TISSUE HOMOGENATE PREPARATIONS
- URINARY ENZYME ACTIVITY

TEST SYSTEMS UTILIZED:

MICE, RATS, GOLDEN HAMSTERS

COMPOUNDS TESTED:

2-SUBSTITUTED FURANS AND THIOPHENES, INCLUDING FUROSEMIDE AND CEPHALORIDINE, VARIOUS DRUGS AND AROMATIC AND ALIPHATIC ENVIRONMENTAL TOXICANTS

TERMINAL:

BOTH SERIAL AND TERMINAL TESTS ARE PERFORMED

ORGANIZATION:

DARTMOUTH MEDICAL SCHOOL
DEPARTMENT OF INTERNAL MEDICINE
HANOVER, NEW HAMPSHIRE 03755

H. VALTIN
PROFESSOR OF MEDICINE
(603) 646-2207

TESTS PERFORMED:

A WIDE VARIETY OF FUNCTIONAL TESTS

TEST SYSTEMS UTILIZED:

UNANESTHETIZED RATS

COMPOUNDS TESTED:

VARIOUS DRUGS

TERMINAL:

BOTH SERIAL AND TERMINAL

ORGANIZATION:

DARTMOUTH MEDICAL SCHOOL
DEPARTMENT OF PHARMACOLOGY
HANOVER, NEW HAMPSHIRE 03755

G. H. MUDGE
PROFESSOR OF PHARMACOLOGY
(603) 646-2715

TESTS PERFORMED:

GLOMERULAR FUNCTION: GLOMERULAR FILTRATION RATE (INULIN AND CREATININE CLEARANCE; DISAPPEARANCE OF RADIOACTIVE SUBSTANCES)
RENAL HEMODYNAMICS: RENAL BLOOD FLOW (PAH CLEARANCE)
TUBULAR FUNCTION: URINARY CONCENTRATING ABILITY (OSMOLALITY)
SECRETIVE TEST (URINARY EXCRETION OF ELECTROLYTES)
BIOCHEMICAL DAMAGE INDICATORS:
DRUG METABOLIC STUDIES
RENAL TISSUE HOMOGENATE PREPARATIONS

TEST SYSTEMS UTILIZED:

MICE, RATS, GUINEA PIGS, HAMSTERS, DOGS

COMPOUNDS TESTED:

VARIOUS DRUGS, RADIOPAQUE AGENTS

TERMINAL:

BOTH SERIAL AND TERMINAL

ORGANIZATION:

DARTMOUTH MEDICAL SCHOOL
DEPARTMENT OF ANATOMY
HANOVER, NEW HAMPSHIRE 03755

W. M. LAYTON, JR.
PROFESSOR OF ANATOMY
(603) 636-2732

TESTS PERFORMED:

MORPHOLOGICAL MEASUREMENTS: LIGHT MICROSCOPY AND ELECTRON MICROSCOPIC STRUCTURAL STUDIES
GLOMERULAR FUNCTION:
- GLOMERULAR FILTRATION RATE (UREA CLEARANCE)
- GLOMERULAR DYSFUNCTION (PHENOSULFONEPTHALEIN [PSP] AND URINARY PROTEIN MEASUREMENT)

TUBULAR FUNCTION:
- SECRETIVE TEST (PAH TRANSPORT MAXIMUM MEASUREMENT)
- URINARY CONCENTRATING ABILITY (OSMOLALITY)

TESTS SYSTEMS UTILIZED:

RATS, DOGS

COMPOUNDS TESTED:

VARIOUS DRUGS

TERMINAL:

BOTH SERIAL AND TERMINAL

ORGANIZATION:

DEPARTMENT OF HEALTH AND WELFARE
HEALTH PROTECTION BRANCH
VANCOUVER 1, B.C., CANADA

G. H. HIRSCH
CHIEF, DRUG LABORATORIES
(604) 666-3802

TESTS PERFORMED:

GLOMERULAR FUNCTION: GLOMERULAR FILTRATION RATE (CREATININE AND UREA CLEARANCE)
TUBULAR FUNCTION:
SECRETIVE TEST
IN VITRO EVALUATION OF RENAL TRANSPORT (CORTICAL SLICE TECHNIQUE)

TEST SYSTEMS UTILIZED:

RATS, RABBITS, GUINEA PIGS, DOGS

COMPOUNDS TESTED:

URANYL NITRATE, POTASSIUM DICHROMATE, GENTAMICIN, TETRAMYCIN, SEVERAL HEAVY METALS, HALOGENATED HYDROCARBONS, VARIOUS DRUGS

TERMINAL:

MOSTLY TERMINAL TYPE OF EXPERIMENTS

ORGANIZATION:

DEPARTMENT OF HEALTH AND WELFARE
HEALTH PROTECTION BRANCH
FOOD DIRECTORATE
TUNNEY'S PASTURE - NEW RESEARCH CENTER
OTTAWA, ONTARIO, CANADA

I. C. MUNRO
DIRECTOR, BUREAU OF CHEMICAL SAFETY
(613) 593-4871

TESTS PERFORMED:

MORPHOLOGICAL MEASUREMENT: LIGHT MICROSCOPY
GLOMERULAR FUNCTION: GLOMERULAR DYSFUNCTION (URINARY PROTEIN MEASUREMENT)
TUBULAR FUNCTION:
SECRETIVE TEST (URINARY EXCRETION OF ELECTROLYTES)
GENERAL TUBULAR DAMAGE (MICROCRYSTALS AND OTHER URINARY SEDIMENT EXAMINATION)

TEST SYSTEMS UTILIZED:

RATS

COMPOUNDS TESTED:

SODIUM AND CALCIUM SACCHARIN, SODIUM CYCLAMATE

TERMINAL:

BOTH SERIAL AND TERMINAL

REMARKS:

IN ADDITION TO I. C. MUNRO, D. L. ARNOLD, B. STAVRIC, B. T. COLLINS AND P. F. McGUIRE ARE INVOLVED IN RENAL TESTING RESEARCH PROGRAMS AT THIS INSTITUTION

ORGANIZATION:

DUKE UNIVERSITY MEDICAL CENTER
DIVISION OF NEPHROLOGY
DURHAM, NORTH CAROLINA 27706

V. W. DENNIS
ASSOCIATE PROFESSOR
(919) 684-5414

TESTS PERFORMED:

GLOMERULAR FUNCTION:
- GLOMERULAR FILTRATION RATE (INULIN AND CREATININE CLEARANCE)
- GLOMERULAR DYSFUNCTION (BLOOD UREA NITROGEN [BUN] AND URINARY PROTEIN MEASUREMENT)

TUBULAR FUNCTION:
- URINARY CONCENTRATING ABILITY (URINE OSMOLALITY)
- SECRETIVE TEST (URINARY EXCRETION OF ELECTROLYTES)

BIOCHEMICAL DAMAGE INDICATOR: PLASMA RENIN MEASUREMENT

TEST SYSTEMS UTILIZED:

RATS, RABBITS, HUMANS

COMPOUNDS TESTED:

HEAVY METALS ESPECIALLY MERCURY COMPOUNDS; CLINICAL TESTING IN HUMANS IS ALSO PERFORMED

TERMINAL:

BOTH SERIAL AND TERMINAL

REMARKS:

IN ADDITION TO V. W. DENNIS, R. R. ROBINSON, R. A. GUNMAN AND J. R. CLAPP ARE ALSO INVOLVED IN RENAL TESTING RESEARCH PROGRAMS AT THIS INSTITUTION

ORGANIZATION:

FOOD AND DRUG RESEARCH LABORATORIES
P.O. BOX 107
WAVERLY, NEW YORK 14892

F. J. KOSCHIER
SENIOR TOXICOLOGIST
(607) 565-2931

TESTS PERFORMED:

TUBULAR FUNCTION:
SECRETIVE TESTS (URINARY DISTRIBUTION AND EXCRETION OF ELECTROLYTES)
IN VITRO EVALUATION OF RENAL TRANSPORT (CORTICAL SLICE TECHNIQUE AND ISOLATED PERFUSED TUBULES)
URINARY CONCENTRATING ABILITY (URINE OSMOLALITY)
RENAL HEMODYNAMICS: RENAL PLASMA FLOW
BIOCHEMICAL DAMAGE INDICATORS:
RENAL METABOLIC STUDIES
URINARY ENZYME ACTIVITY

TEST SYSTEMS UTILIZED:

RATS

COMPOUNDS TESTED:

VARIOUS HERBICIDES AND INSECTICIDES

TERMINAL:

BOTH SERIAL AND TERMINAL

ORGANIZATION:

GEORGETOWN UNIVERSITY
SCHOOL OF MEDICINE AND DENTISTRY
DEPARTMENT OF NEPHROLOGY
WASHINGTON, D.C. 20007

G. E. SCHREINER
HEAD OF DEPARTMENT
(202) 625-7257

TESTS PERFORMED:

MORPHOLOGICAL MEASUREMENTS: LIGHT AND ELECTRON MICROSCOPY
GLOMERULAR FUNCTION:
- GLOMERULAR FILTRATION RATE (CREATININE AND INULIN CLEARANCE)
- GLOMERULAR DYSFUNCTION (BUN AND URINARY PROTEIN MEASUREMENT)

TUBULAR FUNCTION:
- SECRETIVE TEST
  - IN VITRO EVALUATION OF RENAL TRANSPORT (CORTICAL SLICE TECHNIQUE)
- URINARY CONCENTRATING ABILITY (OSMOLALITY AND SPECIFIC GRAVITY)

RENAL HEMODYNAMICS: RENAL BLOOD FLOW (PAH CLEARANCE)
BIOCHEMICAL DAMAGE INDICATOR: URINARY ENZYME ACTIVITY

TEST SYSTEMS UTILIZED:

MICE, RATS, GUINEA PIGS, DOGS, MONKEYS, HUMAN (ADULTS AND CHILDREN) BIOPSIES

COMPOUNDS TESTED:

VARIOUS DRUGS, CANCER CAUSING AGENTS, HEAVY METALS (e.g., MERCURY, CHLORIDE)

TERMINAL:

BOTH SERIAL AND TERMINAL

REMARKS:

BESIDES G. E. SCHREINER, H. PREUSES, W. P. ARGY, JR., L. DIAMOND AND J. WINCHESTER ARE ALSO INVOLVED IN RENAL TESTING PROGRAMS AT THIS INSTITUTION

ORGANIZATION:

HARVARD MEDICAL SCHOOL
BOSTON, MASSACHUSETTS 02115

A. L. LAGE
ASSISTANT PROFESSOR OF VETERINARY MEDICINE
(617) 732-1000

TESTS PERFORMED:

MORPHOLOGICAL MEASUREMENT: LIGHT MICROSCOPY
GLOMERULAR FUNCTION:
GLOMERULAR FILTRATION RATE (CREATININE CLEARANCE)
GLOMERULAR DYSFUNCTION (PSP EXCRETION)
TUBULAR FUNCTION: URINARY CONCENTRATING ABILITY (OSMOLALITY AND SPECIFIC GRAVITY)

TEST SYSTEMS UTILIZED:

RATS, GUINEA PIGS, RABBITS, MONKEYS

COMPOUNDS TESTED:

MOSTLY UNANESTHESIZED ANIMALS ARE USED FOR THESE TESTS; HOWEVER, A FEW STUDIES ARE BEING DONE WITH ANESTHESIZED ANIMALS

TERMINAL:

SERIAL; HOWEVER, SOME MONKEYS ARE TERMINATED AND LIGHT MICROSCOPY IS PERFORMED

ORGANIZATION:

ICI AMERICAS, INC.
BIOMEDICAL RESEARCH DEPARTMENT
WILMINGTON, DELAWARE 19897

S. T. KAU
HEAD, RENAL PHARMACOLOGY SECTION
(302) 575-2501

TESTS PERFORMED:

GLOMERULAR FUNCTION: GLOMERULAR FILTRATION RATE (INULIN CLEARANCE)
TUBULAR FUNCTION:
SECRETIVE TEST (URINARY EXCRETION OF ELECTROLYTES)
IN VITRO EVALUATION OF RENAL TRANSPORT (ISOLATED PERFUSED TUBULES)
URINARY CONCENTRATING ABILITY (OSMOLALITY)
RENAL HEMODYNAMICS: RENAL BLOOD FLOW (PAH CLEARANCE)
BIOCHEMICAL DAMAGE INDICATORS: MEASUREMENTS OF ARTERIAL PCO_2 AND CORRELATIONS WITH CARBONURIA

TEST SYSTEMS UTILIZED:

MICE, RATS, RABBITS, DOGS

COMPOUNDS TESTED:

VARIOUS DRUGS AND COMPOUNDS

TERMINAL:

ONLY SERIAL

ORGANIZATION:

INDIANA UNIVERSITY
SCHOOL OF MEDICINE
DEPARTMENT OF NEUROPATHOLOGY
INDIANAPOLIS, INDIANA 46202

V. PATEL
ASSOCIATE PROFESSOR
(317) 264-4662

TESTS PERFORMED:

MORPHOLOGICAL MEASUREMENTS: LIGHT AND ELECTRON MICROSCOPY
GLOMERULAR FUNCTION:
GLOMERULAR FILTRATION RATE (CREATININE AND UREA CLEARANCE)
GLOMERULAR DYSFUNCTION (URINARY PROTEIN MEASUREMENT)
TUBULAR FUNCTION: URINARY CONCENTRATING ABILITY (OSMOLALITY)
BIOCHEMICAL DAMAGE INDICATOR: URINARY ENZYME ACTIVITY

TEST SYSTEMS UTILIZED:

RATS

COMPOUNDS TESTED:

GENTAMICIN, MERCURY

TERMINAL:

BOTH SERIAL AND TERMINAL

REMARKS:

IN ADDITION TO V. PATEL, F. C. LUFT, W. ZEMAN AND S. A. KLEIT ARE INVOLVED IN RENAL TESTING AT THIS INSTITUTION

ORGANIZATION:

MEDICAL COLLEGE OF VIRGINIA
DEPARTMENT OF MEDICINE
RICHMOND, VIRGINIA 23298

D. E. OKEN
PROFESSOR OF MEDICINE
(804) 786-9682

TESTS PERFORMED:

MORPHOLOGICAL MEASUREMENT: HISTOPATHOLOGY
GLOMERULAR FUNCTION:
- GLOMERULAR FILTRATION RATE (INULIN AND UREA CLEARANCE)
- GLOMERULAR BLOOD FLOW
- GLOMERULAR DYSFUNCTION (URINARY PROTEIN MEASUREMENT)

BIOCHEMICAL DAMAGE INDICATOR: URINARY ENZYME ACTIVITY

TEST SYSTEMS UTILIZED:

RATS

COMPOUNDS TESTED:

MOSTLY HEAVY METALS SUCH AS MERCURY CHLORIDE, SODIUM DICHROMATE, ETC.

TERMINAL:

BOTH SERIAL AND TERMINAL

ORGANIZATION:

MICHIGAN STATE UNIVERSITY
DEPARTMENT OF PHARMACOLOGY
B420 LIFE SCIENCE BUILDING
EAST LANSING, MICHIGAN 48824

J. B. HOOK
PROFESSOR OF PHARMACOLOGY
(517) 353-3718

TESTS PERFORMED:

GLOMERULAR FUNCTION:
- GLOMERULAR FILTRATION RATE (CREATININE AND UREA CLEARANCE)
- GLOMERULAR DYSFUNCTION (BUN, URINARY PROTEIN AND PSP MEASUREMENT)

TUBULAR FUNCTION:
- SECRETIVE TEST
  - IN VITRO EVALUATION OF RENAL TRANSPORT (CORTICAL SLICE TECHNIQUE)
- URINARY CONCENTRATING ABILITY (OSMOLALITY)

TEST SYSTEMS UTILIZED:

MICE, RATS

COMPOUNDS TESTED:

VARIOUS NEPHROTOXIC AGENTS

TERMINAL:

BOTH SERIAL AND TERMINAL

REMARKS:

IN ADDITION TO J. B. HOOK, K. M. McCORMACK, D. E. RICKERT AND V. L. SANGER ARE ALSO INVOLVED IN RENAL TESTING PROGRAMS AT THIS INSTITUTION

ORGANIZATION:

MOUNT DESERT ISLAND BIOLOGICAL LABORATORIES
P.O. BOX 25
SALISBURY COVE, MAINE 04672

B. SCHMIDT-NIELSEN
DEPUTY DIRECTOR
(207) 288-4690

TESTS PERFORMED:

MORPHOLOGICAL MEASUREMENTS: LIGHT AND ELECTRON MICROSCOPY
TUBULAR FUNCTIONS

TEST SYSTEMS UTILIZED:

RATS, GOLDEN HAMSTERS

COMPOUNDS TESTED:

LISAMINE GREEN DYE

TERMINAL:

BOTH SERIAL AND TERMINAL

ORGANIZATION:

NATIONAL INSTITUTES OF HEALTH
NATIONAL HEART AND LUNG INSTITUTE
LABORATORY OF KIDNEY AND ELECTROLYTE METABOLISM
BETHESDA, MARYLAND

M. B. BURG
CHIEF OF LABORATORIES
(301) 496-3187

TESTS PERFORMED:

GLOMERULAR FUNCTION: GLOMERULAR FILTRATION RATE (INULIN CLEARANCE)
TUBULAR FUNCTION:
SECRETIVE TEST
IN VITRO EVALUATION OF RENAL TRANSPORT (CORTICAL SLICE TECHNIQUE AND ISOLATED PERFUSED TUBULES)
BIOCHEMICAL DAMAGE INDICATOR: URINARY ENZYME ACTIVITY

TEST SYSTEMS UTILIZED:

RABBITS

COMPOUNDS TESTED:

ORGANIC ACIDS AND BASES, ELECTROLYTES

TERMINAL:

PROCEDURES USED ARE TERMINAL EXCEPT URINALYSIS AND INULIN CLEARANCE TESTS

REMARKS:

ISOLATED PERFUSED SINGLE TUBULE TECHNIQUE IS NOT SUITABLE FOR ROUTINE OR SCREENING PURPOSES

ORGANIZATION:

NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES
NATIONAL TOXICOLOGY PROGRAM
RESEARCH TRIANGLE PARK, NORTH CAROLINA 27709

W. M. KLUWE
STAFF FELLOW
(919) 541-2690

TESTS PERFORMED:

MORPHOLOGICAL MEASUREMENT: HISTOPATHOLOGY
GLOMERULAR FUNCTION: MEASUREMENT OF GLOMERULAR FILTRATION RATE (CREATININE CLEARANCE)
TUBULAR FUNCTION:
SECRETIVE TEST
IN VITRO EVALUATION OF RENAL TRANSPORT (CORTICAL SLICE TECHNIQUE)
URINARY CONCENTRATING ABILITY (OSMOLALITY AND SPECIFIC GRAVITY)
BIOCHEMICAL DAMAGE INDICATOR: URINARY ENZYME ACTIVITY

TEST SYSTEMS UTILIZED:

MICE, RATS

COMPOUNDS TESTED:

HEAVY METALS, HALOGENATED HYDROCARBONS

TERMINAL:

BOTH SERIAL AND TERMINAL

REMARKS:

HISTOPATHOLOGIC EXAMINATION OF THE RENAL TISSUES IS THE BEST DETERMINANT OF RENAL DAMAGE; HOWEVER, IT PROVIDES LITTLE INFORMATION CONCERNING RENAL FUNCTION. GAMMA-GLUTAMYL TRANSPEPTIDASE IS PRESENT IN SUFFICIENT AMOUNTS IN THE URINE OF RODENTS TO INDICATE RENAL DAMAGE

ORGANIZATION:

NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES
LABORATORY OF ENVIRONMENTAL TOXICOLOGY
P.O. BOX 12233
RESEARCH TRIANGLE PARK, NORTH CAROLINA 27709

B. A. FOWLER
RESEARCH BIOLOGIST AND HEAD OF RENAL AND
INTERCELLULAR FUNCTION AND TOXICOLOGY GROUP
(919) 541-3269

TESTS PERFORMED:

MORPHOLOGICAL MEASUREMENTS: LIGHT AND ELECTRON MICROSCOPY
GLOMERULAR FUNCTION:
GLOMERULAR FILTRATION RATE (CREATININE AND UREA CLEARANCE)
GLOMERULAR DYSFUNCTION (URINARY PROTEIN AND PORPHYRIN MEASUREMENT)
BIOCHEMICAL DAMAGE INDICATOR: URINARY ENZYME ACTIVITY

TEST SYSTEMS UTILIZED:

MICE, RATS, RABBITS

COMPOUNDS TESTED:

MOSTLY HEAVY METALS SUCH AS MERCURY, CADMIUM, LEAD, ARSENIC, ETC.

TERMINAL:

BOTH SERIAL AND TERMINAL

REMARKS:

BESIDES B. A. FOWLER, J. S. WOODS IS ALSO ACTIVELY INVOLVED IN RENAL TESTING PROGRAMS.

ORGANIZATION:

NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES
P.O. BOX 12233
RESEARCH TRIANGLE PARK, NORTH CAROLINA 27709

R. GOYER
DEPUTY DIRECTOR
(919) 541-3201

TESTS PERFORMED:

MORPHOLOGICAL MEASUREMENTS: LIGHT AND ELECTRON MICROSCOPY
GLOMERULAR FUNCTION:
GLOMERULAR FILTRATION RATE (CREATININE CLEARANCE)
GLOMERULAR DYSFUNCTION (URINARY PROTEIN MEASUREMENT)
BIOCHEMICAL DAMAGE INDICATORS

TEST SYSTEMS UTILIZED:

MICE, RATS

COMPOUNDS TESTED:

CADMIUM AND ZINC CHLORIDES, CADMIUM METALLOTHEONEIN

TERMINAL:

BOTH SERIAL AND TERMINAL

ORGANIZATION:

NORTH CAROLINA CENTRAL UNIVERSITY
DEPARTMENT OF BIOLOGY
DURHAM, NORTH CAROLINA 27707

V. CLARK
ASSOCIATE PROFESSOR
(919) 683-6248

TESTS PERFORMED:

GLOMERULAR FUNCTION: GLOMERULAR FILTRATION RATE (URINARY PROTEIN MEASUREMENT)
TUBULAR FUNCTION: URINARY CONCENTRATING ABILITY
BIOCHEMICAL DAMAGE INDICATOR: URINARY ENZYME ACTIVITY

TEST SYSTEMS UTILIZED:

RATS

COMPOUNDS TESTED:

HEAVY METALS, ESPECIALLY CADMIUM

TERMINAL:

ONLY SERIAL

ORGANIZATION:

OHIO STATE UNIVERSITY
COLLEGE OF VETERINARY MEDICINE
DEPARTMENT OF VETERINARY PHYSIOLOGY AND PHARMACOLOGY
COLUMBUS, OHIO 43210

R. C. GARG
ADJUNCT ASSISTANT PROFESSOR AND SENIOR
RESEARCH ASSOCIATE
(614) 422-0492

TESTS PERFORMED:

GLOMERULAR FUNCTION: GLOMERULAR FILTRATION RATE (^{125}I-IOTHALAMATE DISAPPEARANCE)
RENAL HEMODYNAMICS: RENAL BLOOD FLOW (^{131}I SODIUM IODOHIPPURATE CLEARANCE)

TEST SYSTEMS UTILIZED:

DOGS, CATS, COWS

COMPOUNDS TESTED:

MOSTLY UNTREATED ANIMALS ARE USED

TERMINAL:

ONLY SERIAL

REMARKS:

IN ADDITION TO R. C. GARG, T. E. POWERS AND J. D. POWERS ARE ACTIVELY INVOLVED IN RENAL TESTING PROGRAMS AT THIS INSTITUTION.

ORGANIZATION:

SCHERING-PLOUGH CORPORATION
P.O. BOX 32
LAFAYETTE, NEW JERSEY 07848

L. E. ARTHAUD
PRINCIPAL TOXICOLOGIST
(201) 383-3211

TESTS PERFORMED:

MORPHOLOGICAL MEASUREMENTS: LIGHT AND ELECTRON MICROSCOPY
GLOMERULAR FUNCTION: GLOMERULAR DYSFUNCTION (BUN AND URINARY PROTEIN MEASUREMENT)
TUBULAR FUNCTION: URINARY CONCENTRATING ABILITY (OSMOLALITY)

TEST SYSTEMS UTILIZED:

RATS, DOGS

COMPOUNDS TESTED:

BROMOETHYLAMINE, METHOXYFLURANE

TERMINAL:

BOTH SERIAL AND TERMINAL

ORGANIZATION:

SMITH KLINE AND FRENCH LABORATORIES
PHILADELPHIA, PENNSYLVANIA 19101

F. T. BRENNAN
SENIOR PHARMACOLOGIST
(215) 854-4000 Ext. 5510

TESTS PERFORMED:

MORPHOLOGICAL MEASUREMENT: LIGHT MICROSCOPY
GLOMERULAR FUNCTION: GLOMERULAR FILTRATION RATE (INULIN AND CREATININE CLEARANCE)
TUBULAR FUNCTION: SECRETIVE TEST (URINARY EXCRETION OF ELECTROLYTES)
RENAL HEMODYNAMICS: RENAL PLASMA FLOW (PAH CLEARANCE)

TEST SYSTEMS UTILIZED:

RATS, DOGS, MONKEYS

COMPOUNDS TESTED:

TRIAMTERENE, HYDROCHLOROTHIAZIDE, FUROSEMIDE, ACETAZOLEAMIDE, DOPAMINE, BULBOCAPNINE, VARIOUS DRUGS

TERMINAL:

BOTH SERIAL AND TERMINAL

REMARKS:

BESIDES F. T. BRENNAN, V. D. WIEBELHAUS IS INVOLVED IN RENAL TESTING PROGRAMS AT THIS INSTITUTION

ORGANIZATION:

SOUTHERN CALIFORNIA EDISON POWER COMPANY
RESEARCH AND DEVELOPMENT DEPARTMENT
ROSEMEAD, CALIFORNIA

E. J. FAEDER
SENIOR RESEARCH SCIENTIST
(213) 572-2009

TESTS PERFORMED:

MORPHOLOGICAL MEASUREMENT: LIGHT MICROSCOPY
GLOMERULAR FUNCTION: GLOMERULAR DYSFUNCTION (URINARY PROTEIN MEASUREMENT)
BIOCHEMICAL DAMAGE INDICATORS

TEST SYSTEMS UTILIZED:

RATS

COMPOUNDS TESTED:

CADMIUM, ZINC

TERMINAL:

BOTH SERIAL AND TERMINAL

ORGANIZATION:

THE SQUIBB INSTITUTE FOR MEDICAL RESEARCH
DEPARTMENT OF DRUG METABOLISM
NEW BRUNSWICK, NEW JERSEY 08903

S. M. SINGHVI
RESEARCH GROUP LEADER
(201) 545-1300

TESTS PERFORMED:

MORPHOLOGICAL MEASUREMENT: LIGHT MICROSCOPY
GLOMERULAR FUNCTION:
GLOMERULAR FILTRATION RATE (CREATININE AND UREA CLEARANCE)
GLOMERULAR DYSFUNCTION (BUN MEASUREMENT)
TUBULAR FUNCTION: SECRETIVE TEST (PAH TRANSPORT MAXIMUM MEASUREMENT)
RENAL HEMODYNAMICS: RENAL BLOOD FLOW (PAH CLEARANCE)
BIOCHEMICAL DAMAGE INDICATOR: URINARY ENZYME ACTIVITY

TEST SYSTEMS UTILIZED:

RATS, DOGS, MONKEYS

COMPOUNDS TESTED:

URANYL NITRATE, MERCURIC CHLORIDE, CARBON TETRACHLORIDE

TERMINAL:

BOTH SERIAL AND TERMINAL

REMARKS:

IN ADDITION TO S. M. SINGHVI, L. T. DIFAZIO AND J. W. POUTSIAKA ARE INVOLVED IN RENAL TESTING PROGRAMS AT THIS INSTITUTION

ORGANIZATION:

STANFORD UNIVERSITY
SCHOOL OF MEDICINE
DEPARTMENT OF CLINICAL PATHOLOGY
STANFORD, CALIFORNIA 94305

J. C. KOSEK
PROFESSOR OF CLINICAL PATHOLOGY
(415) 493-5000 EXT. 5753

TESTS PERFORMED:

MORPHOLOGICAL MEASUREMENTS: LIGHT AND ELECTRON MICROSCOPY
TUBULAR FUNCTION: SECRETIVE TEST (URINARY EXCRETION OF ELECTROLYTES)
BIOCHEMICAL DAMAGE INDICATORS

TEST SYSTEMS UTILIZED:

MICE, RATS, RABBITS, GUINEA PIGS

COMPOUNDS TESTED:

GENTAMICIN AND OTHER AMINOGLYCOSIDES

TERMINAL:

BOTH SERIAL AND TERMINAL

REMARKS:

IN ADDITION TO J. C. KOSEK, M. J. COUSINS IS INVOLVED IN RENAL TESTING PROGRAMS AT THIS INSTITUTION

ORGANIZATION:

STANFORD UNIVERSITY
SCHOOL OF MEDICINE
DEPARTMENT OF ANESTHESIOLOGY
STANFORD, CALIFORNIA 94305

R. I. MAZZE
ASSISTANT CHAIRMAN
(415) 497-6411

TESTS PERFORMED:

MORPHOLOGICAL MEASUREMENTS: LIGHT AND ELECTRON MICROSCOPY
GLOMERULAR FUNCTION:
- GLOMERULAR FILTRATION RATE (CREATININE AND UREA CLEARANCE)
- GLOMERULAR DYSFUNCTION (BUN AND URINARY PROTEIN MEASUREMENT)

TUBULAR FUNCTION:
- URINARY CONCENTRATING ABILITY (OSMOLALITY)
- SECRETIVE TEST (URINARY EXCRETION OF ELECTROLYTES)

BIOCHEMICAL DAMAGE INDICATORS

TEST SYSTEMS UTILIZED:

MICE, RATS

COMPOUNDS TESTED:

METHOXYFLURANE, FLUORIDE

TERMINAL:

BOTH SERIAL AND TERMINAL

ORGANIZATION:

STATE UNIVERSITY OF NEW YORK, STONY BROOK
DEPARTMENT OF NEPHROLOGY
STONY BROOK, LONG ISLAND
NEW YORK 11794

G. J. KALOYANIDES
CHAIRMAN
(516) 246-2038

TESTS PERFORMED:

MORPHOLOGICAL MEASUREMENTS: LIGHT AND ELECTRON MICROSCOPY
GLOMERULAR FUNCTION:
- GLOMERULAR DYSFUNCTION (URINARY PROTEIN MEASUREMENT)
- GLOMERULAR FILTRATION RATE (INULIN AND CREATININE CLEARANCE)

TUBULAR FUNCTION:
- SECRETIVE TEST
  - *IN VITRO* EVALUATION OF RENAL TRANSPORT (CORTICAL SLICE TECHNIQUE)

BIOCHEMICAL DAMAGE INDICATORS

TEST SYSTEMS UTILIZED:

RATS

COMPOUNDS TESTED:

VARIOUS ANTIBIOTICS

TERMINAL:

BOTH SERIAL AND TERMINAL

ORGANIZATION:

UNIVERSITY OF ARKANSAS
SCHOOL FOR MEDICAL SCIENCES
DEPARTMENT OF PATHOLOGY
4306 WEST MARKHAM STREET
LITTLE ROCK, ARKANSAS 72201

L. W. CHANG
ASSOCIATE PROFESSOR
(501) 661-5171

TESTS PERFORMED:

MORPHOLOGICAL MEASUREMENTS: LIGHT AND ELECTRON MICROSCOPY
GLOMERULAR FUNCTION: GLOMERULAR DYSFUNCTION (URINARY PROTEIN MEASUREMENT)
TUBULAR FUNCTION: SECRETIVE TEST (URINARY EXCRETION OF ELECTROLYTES)
BIOCHEMICAL DAMAGE INDICATOR: URINARY ENZYME ACTIVITY

TEST SYSTEMS UTILIZED:

MICE, RATS, GOLDEN HAMSTERS

COMPOUNDS TESTED:

MOSTLY HEAVY METALS - LEAD, CADMIUM, MERCURIC, BICHLORIDE, METHYLMERCURIC CHLORIDE

TERMINAL:

BOTH SERIAL AND TERMINAL; HOWEVER, MOSTLY ANIMALS ARE TERMINATED FOR MICROSCOPIC STUDIES.

ORGANIZATION:

UNIVERSITY OF CINCINNATI MEDICAL CENTER
DEPARTMENT OF ENVIRONMENTAL HEALTH
3223 EDEN AVENUE
CINCINNATI, OHIO 45267

D. R. JOHNSON
ASSOCIATE PROFESSOR AND HEAD OF GRADUATE STUDIES
(513) 872-5759

TESTS PERFORMED:

MORPHOLOGICAL MEASUREMENTS: GROSS APPEARANCE AND LIGHT MICROSCOPY
GLOMERULAR FUNCTION: GLOMERULAR FILTRATION RATE (CREATININE AND INULIN CLEARANCE)
TUBULAR FUNCTION:
SECRETIVE TESTS (URINARY EXCRETION OF ELECTROLYTES)
IN VITRO EVALUATION OF RENAL TRANSPORT (CORTICAL SLICE TECHNIQUE)
RENAL HEMODYNAMICS: RENAL PLASMA FLOW (PAH CLEARANCE)

TEST SYSTEMS UTILIZED:

RATS

COMPOUNDS TESTED:

HEAVY METALS - LEAD, MERCURY, ETC.

TERMINAL:

BOTH SERIAL AND TERMINAL

REMARKS:

IN ADDITION TO D. R. JOHNSON, L. I. KLEINMAN IS ENGAGED IN THE RENAL TESTING PROGRAM AT THIS INSTITUTION

ORGANIZATION:

UNIVERSITY OF HOUSTON
COLLEGE OF PHARMACY
DIVISION OF CARDIOVASCULAR RESEARCH
HOUSTON, TEXAS

J. P. BUCKLEY
DEAN
(713) 749-4106

TESTS PERFORMED:

MORPHOLOGICAL MEASUREMENTS: LIGHT AND ELECTRON MICROSCOPY
TUBULAR FUNCTION: SECRETIVE TEST (URINARY EXCRETION OF ELECTROLYTES)

TEST SYSTEMS UTILIZED:

DOGS, CATS

COMPOUNDS TESTED:

ANGIOTENSIN II

TERMINAL:

BOTH SERIAL AND TERMINAL, BUT MOST OF THE ANIMALS ARE TERMINATED FOR MICROSCOPIC EXAMINATION

REMARKS:

IN ADDITION TO J. P. BUCKLEY, M. L. STEENBERG AND B. S. JANDHYALA ARE ACTIVELY INVOLVED IN RENAL TESTING PROGRAMS AT THIS INSTITUTION

ORGANIZATION:

UNIVERSITY OF IOWA
COLLEGE OF MEDICINE
DIVISION OF NEPHROLOGY, HYPERTENSION AND ELECTROLYTES
IOWA CITY, IOWA 52242

L. COHEN
ASSISTANT PROFESSOR
(319) 353-3126

TESTS PERFORMED:

GLOMERULAR FUNCTION:
- GLOMERULAR DYSFUNCTION (BUN MEASUREMENT)
- GLOMERULAR FILTRATION RATE (INULIN AND CREATININE CLEARANCE)

TUBULAR FUNCTION:
- SECRETIVE TESTS (URINARY EXCRETION OF ELECTROLYTES)
- IN VITRO EVALUATION OF RENAL TRANSPORT (CORTICAL SLICE TECHNIQUE AND ISOLATED PERFUSED TUBULES)
- URINARY CONCENTRATING ABILITY (OSMOLALITY)

RENAL HEMODYNAMICS: RENAL BLOOD FLOW MEASUREMENT (PAH CLEARANCE)

TEST SYSTEMS UTILIZED:

RATS, DOGS, RABBITS

COMPOUNDS TESTED:

GENTAMICIN AND OTHER AMINOGLYCOSIDES

TERMINAL:

BOTH SERIAL AND TERMINAL

ORGANIZATION:

UNIVERSITY OF MISSISSIPPI MEDICAL CENTER
DEPARTMENT OF PHARMACOLOGY AND TOXICOLOGY
JACKSON, MISSISSIPPI 39216

W. O. BERNDT
CHAIRMAN
(601) 987-4729

TESTS PERFORMED:

GLOMERULAR FUNCTION: GLOMERULAR DYSFUNCTION (URINARY PROTEIN)
TUBULAR FUNCTION:
- REABSORPTIVE TEST (GLUCOSE MEASUREMENT IN URINE)
- SECRETIVE TEST
  - IN VITRO EVALUATION OF RENAL TRANSPORT (CORTICAL SLICE TECHNIQUE)
- URINARY CONCENTRATING ABILITY (OSMOLALITY)

TEST SYSTEMS UTILIZED:

MICE, RATS, RABBITS, DOGS

COMPOUNDS TESTED:

HEAVY METALS, HALOGENATED HYDROCARBONS, CITRININ, RADIOPAQUE SUBSTANCES

TERMINAL:

BOTH SERIAL AND TERMINAL

ORGANIZATION:

UNIVERSITY OF MONTREAL
DEPARTMENT OF PHARMACOLOGY
MONTREAL, QUEBEC H3C3J7, CANADA

G. L. PLAA
CHAIRMAN
(514) 343-6334

TESTS PERFORMED:

MORPHOLOGICAL MEASUREMENT: LIGHT MICROSCOPY
GLOMERULAR FUNCTION: GLOMERULAR DYSFUNCTION (URINARY PROTEIN AND PSP MEASUREMENT)
TUBULAR FUNCTION:
REABSORPTIVE TEST (GLUCOSE MEASUREMENT IN URINE)
SECRETIVE TEST
IN VITRO EVALUATION OF RENAL TRANSPORT (CORTICAL SLICE TECHNIQUES)

TEST SYSTEMS UTILIZED:

MICE, RATS, RABBITS

COMPOUNDS TESTED:

MIREX, CHLOROFORM, MERCURY, CHROMATE, ANTIBIOTICS

TERMINAL:

BOTH SERIAL AND TERMINAL; HOWEVER, MOSTLY EXPERIMENTAL ANIMALS ARE TERMINATED FOR EITHER MICROSCOPIC STUDIES OR IN VITRO RENAL CORTICAL SLICE TECHNIQUE STUDIES

ORGANIZATION:

UNIVERSITY OF NORTH CAROLINA
SCHOOL OF MEDICINE
DIVISION OF NEPHROLOGY
CHAPEL HILL, NORTH CAROLINA 27514

W. F. FINN
ASSOCIATE PROFESSOR
(919) 966-2561

TESTS PERFORMED:

MORPHOLOGICAL MEASUREMENT: LIGHT MICROSCOPY
GLOMERULAR FUNCTION: GLOMERULAR FILTRATION RATE (INULIN CLEARANCE)
TUBULAR FUNCTION: URINARY CONCENTRATING ABILITY (OSMOLALITY)
RENAL HEMODYNAMICS:
RENAL BLOOD FLOW (PAH CLEARANCE)
INTRARENAL DISTRIBUTION OF RENAL BLOOD FLOW (^{85}Kr and ^{133}Xe - WASHOUT MEASUREMENT)

TEST SYSTEMS UTILIZED:

ANESTHETIZED RATS

COMPOUNDS TESTED:

MERCURIC CHLORIDE, BARIUM SULFATE AND VASCULAR SHOCK PRODUCED BY CLAMPING OF THE RENAL ARTERY

TERMINAL:

BOTH SERIAL AND TERMINAL; HOWEVER, MOST OF THE EXPERIMENTAL ANIMALS ARE TERMINATED FOR MICROSCOPIC EXAMINATION

ORGANIZATION:

UNIVERSITY OF NORTH CAROLINA
SCHOOL OF MEDICINE
DIVISION OF NEPHROLOGY
CHAPEL HILL, NORTH CAROLINA 27514

C. W. GOTTSCHALK
PROFESSOR OF MEDICINE
(919) 966-4567

TESTS PERFORMED:

MORPHOLOGICAL MEASUREMENTS: LIGHT MICROSCOPY
TUBULAR FUNCTIONS:
SECRETIVE TEST (URINARY EXCRETION OF ELECTROLYTES)
URINARY CONCENTRATING ABILITY (OSMOLALITY)

TEST SYSTEMS UTILIZED:

RATS

COMPOUNDS TESTED:

MERCURY, POTASSIUM DICHROMATE

TERMINAL:

BOTH SERIAL AND TERMINAL

REMARKS:

IN ADDITION TO C. W. GOTTSCHALK, W. E. LASSITER AND W. FINN ARE INVOLVED IN RENAL TESTING PROGRAMS AT THIS INSTITUTION

ORGANIZATION:

UNIVERSITY OF OTTAWA
SCHOOL OF MEDICINE
DEPARTMENT OF PHARMACOLOGY
OTTAWA, ONTARIO, K1N6N5 CANADA

R. L. SINGHAL
PROFESSOR AND HEAD
(613) 231-3238

TESTS PERFORMED:

GLOMERULAR FUNCTION:
GLOMERULAR DYSFUNCTION (URINARY PROTEIN AND BUN MEASUREMENT)
GLOMERULAR FILTRATION RATE (CREATININE AND UREA CLEARANCE)
BIOCHEMICAL DAMAGE INDICATOR: RENAL TISSUE HOMOGENATE PREPARATIONS

TEST SYSTEMS UTILIZED:

RATS

COMPOUNDS TESTED:

VARIOUS INSECTICIDES
HEAVY METALS - MERCURY, LEAD, CADMIUM, ETC.

TERMINAL:

BOTH SERIAL AND TERMINAL

ORGANIZATION:

UNIVERSITY OF PENNSYLVANIA
SCHOOL OF MEDICINE
THE RENAL-ELECTROLYTE SECTION
PHILADELPHIA, PENNSYLVANIA 19104

Z. S. AGUS
CHIEF, THE RENAL-ELECTROLYTE SECTION
(215) 662-3603

TESTS PERFORMED:

GLOMERULAR FUNCTION: GLOMERULAR FILTRATION RATE (CREATININE AND INULIN CLEARANCE)
TUBULAR FUNCTION:
REABSORPTIVE TEST (GLUCOSE MEASUREMENT IN URINE)
SECRETIVE TEST (URINARY EXCRETION OF ELECTROLYTES)
RENAL HEMODYNAMICS: RENAL BLOOD FLOW (PAH CLEARANCE)

TEST SYSTEMS UTILIZED

MICE, RATS, RABBITS, CATS, DOGS

COMPOUNDS TESTED:

NONE, ONLY NORMAL ANIMALS ARE USED

TERMINAL:

SERIAL ONLY

REMARKS:

IN ADDITION TO Z. S. AGUS, STANLEY GOLDFORB IS ACTIVELY INVOLVED IN RENAL TESTING PROGRAMS AT THIS INSTITUTION

ORGANIZATION:

UNIVERSITY OF ROCHESTER
SCHOOL OF MEDICINE
DEPARTMENT OF RADIATION BIOLOGY AND BIOPHYSICS
ROCHESTER, NEW YORK 14642

T. W. CLARKSON
PROFESSOR
(716) 275-3911

TESTS PERFORMED:

MORPHOLOGICAL MEASUREMENT: LIGHT MICROSCOPY
TUBULAR FUNCTION:
SECRETIVE TEST
IN VITRO EVALUATION OF RENAL TRANSPORT (ISOLATED PERFUSED TUBULES)
BIOCHEMICAL DAMAGE INDICATOR: RENAL TISSUE HOMOGENATE PREPARATIONS

TEST SYSTEMS UTILIZED:

MICE, RATS, DOGS

COMPOUNDS TESTED:

ELEMENTAL MERCURY VAPOR, METHYL MERCURY, CADMIUM, LEAD AND OTHER HEAVY METALS

TERMINAL:

BOTH SERIAL AND TERMINAL

ORGANIZATION:

UNIVERSITY OF ROCHESTER
SCHOOL OF MEDICINE AND DENTISTRY
DIVISION OF TOXICOLOGY
ROCHESTER, NEW YORK 14642

Z.A. SHAIKH
ASSISTANT PROFESSOR
(716) 275-5383

TESTS PERFORMED:

TUBULAR FUNCTION: PROTEIN AND GLUCOSE MEASUREMENTS IN URINE
HISTOLOGY: KIDNEY, LIVER
BIOLOGICAL INDICATOR OF TOXICITY: METALLOTHIONEIN MEASUREMENTS IN PLASMA AND URINE

TEST SYSTEMS USED:

MICE, RATS, RABBITS
ALSO ASSAY OF METALLOTHIONEIN IN PLASMA AND URINE FROM HUMANS

SUBSTANCES USED:

CADMIUM, MERCURY AND OTHER HEAVY METALS

TERMINAL:

BOTH SERIAL AND TERMINAL

ORGANIZATION:

UNIVERSITY OF TENNESSEE CENTER FOR THE HEALTH SCIENCES
DIVISION OF NEPHROLOGY
MEMPHIS, TENNESSEE 38163

F. E. HATCH
PROFESSOR OF MEDICINE
(901) 528-5765

TESTS PERFORMED:

MORPHOLOGICAL MEASUREMENTS: LIGHT AND ELECTRON MICROSCOPY
GLOMERULAR FUNCTION:
GLOMERULAR DYSFUNCTION (BUN MEASUREMENT)
GLOMERULAR FILTRATION RATE (CREATININE, INULIN AND UREA CLEARANCE)
TUBULAR FUNCTION: URINARY CONCENTRATING ABILITY (OSMOLALITY AND SPECIFIC GRAVITY)

TEST SYSTEMS UTILIZED:

MICE, RATS, RABBITS, DOGS

COMPOUNDS TESTED:

NO SUBSTANCE OR DRUG IS TESTED, BUT NORMAL ANIMALS ARE USED

TERMINAL:

BOTH SERIAL AND TERMINAL

REMARKS:

IN ADDITION TO F. E. HATCH, L. R. CROWE IS INVOLVED IN RENAL TESTING PROGRAMS AT THIS INSTITUTION

ORGANIZATION:

UNIVERSITY OF WASHINGTON
SCHOOL OF MEDICINE
DEPARTMENT OF PHARMACOLOGY
SEATTLE, WASHINGTON 98195

T. A. LOOMIS
PROFESSOR
(206) 543-0169

TESTS PERFORMED:

MORPHOLOGICAL MEASUREMENT: LIGHT MICROSCOPY
TUBULAR FUNCTION: URINARY CONCENTRATING ABILITY (OSMOLALITY)
BIOCHEMICAL DAMAGE INDICATORS

TEST SYSTEMS UTILIZED:

RATS

COMPOUNDS TESTED:

FLUORIDE, METHOXYFLURANE

TERMINAL:

BOTH SERIAL AND TERMINAL

ORGANIZATION:

UNIVERSITY OF WESTERN ONTARIO
DEPARTMENT OF PATHOLOGY
LONDON, ONTARIO, CANADA

G. M. CHERIAN
ASSISTANT PROFESSOR
(519) 679-6743

TESTS PERFORMED:

MORPHOLOGICAL MEASUREMENTS: LIGHT AND ELECTRON MICROSCOPY
GLOMERULAR FUNCTION: GLOMERULAR FILTRATION RATE (INULIN CLEARANCE)
RENAL HEMODYNAMICS: RENAL BLOOD FLOW (PAH CLEARANCE)
BIOCHEMICAL DAMAGE INDICATOR: RENAL TISSUE HOMOGENATE PREPARATIONS

TEST SYSTEMS UTILIZED:

MICE, RATS, RABBITS

COMPOUNDS TESTED:

MERCURY, CADMIUM AND OTHER HEAVY METALS

TERMINAL:

BOTH SERIAL AND TERMINAL

ORGANIZATION:

U. S. ENVIRONMENTAL PROTECTION AGENCY
GENETICS TOXICOLOGY DIVISION
RESEARCH TRIANGLE PARK, NORTH CAROLINA 27711

L. C. KING
RESEARCH BIOLOGIST
(919) 541-3932

TESTS PERFORMED:

MORPHOLOGICAL MEASUREMENTS: SCANNING ELECTRON MICROSCOPIC STRUCTURAL STUDIES
BIOCHEMICAL DAMAGE INDICATORS:
RENAL METABOLIC STUDIES
URINARY ENZYME ACTIVITY

TEST SYSTEMS UTILIZED:

RATS

COMPOUNDS TESTED:

CADMIUM

TERMINAL:

BOTH SERIAL AND TERMINAL

ORGANIZATION:

VANDERBILT UNIVERSITY
SCHOOL OF MEDICINE
DEPARTMENT OF PHARMACOLOGY
NASHVILLE, TENNESSEE 37232

B.V. RAMA SASTRY
PROFESSOR
(615) 322-2207

TESTS PERFORMED:

GLOMERULAR FUNCTION: GLOMERULAR FILTRATION RATE (INULIN CLEARANCE)
TUBULAR FUNCTION: SECRETIVE TEST (URINARY EXCRETION OF ELECTROLYTES
RENAL HEMODYNAMICS: RENAL BLOOD FLOW (PAH CLEARANCE)
BIOCHEMICAL DAMAGE INDICATOR: PLASMA RENIN MEASUREMENT

TEST SYSTEMS UTILIZED:

RATS

COMPOUNDS TESTED:

TRIAMTERENE

TERMINAL:

ONLY SERIAL

APPENDIX A

TESTS PERFORMED BY EACH ORGANIZATION

MORPHOLOGICAL MEASUREMENTS

GENERAL MORPHOLOGY, HISTOPATHOLOGY

Baylor College of Medicine
Dartmouth Medical College
Department of Health and Welfare, Ottawa, Canada
Environmental Protection Agency
Georgetown University
Harvard Medical School
Indiana University
Medical College of Virginia
Mount Desert Island Biological Laboratories
National Institute of Environmental Health Sciences
Schering-Plough Corporation
Smith Kline and French Laboratories
Southern California Edison Power Company
The Squibb Institute for Medical Research
Stanford University
State University of New York, Stony Brook
University of Arkansas
University of Cincinnati Medical Center
University of Houston
University of Montreal
University of North Carolina
University of Ottawa
University of Rochester
University of Tennessee Center for the Health Sciences
University of Washington
University of Western Ontario

GLOMERULAR FUNCTION

Dartmouth Medical School
Department of Health and Welfare, Ottawa, Canada
Duke University Medical Center
Georgetown University
Harvard Medical School
ICI Americas, Inc.
Indiana University
Medical College of Virginia
Michigan State University
National Institute of Health
National Institute of Environmental Health Sciences
North Carolina Central University
Ohio State University
Schering-Plough Corporation

Smith Kline and French Laboratories
Southern California Edison Power Company
The Squibb Institute for Medical Research
Stanford University
State University of New York, Stoney Brook
University of Arkansas
University of Cincinnati Medical Center
University of Iowa
University of Mississippi Medical Center
University of Montreal
University of North Carolina
University of Ottawa
University of Rochester
University of Tennessee Center for the Health Sciences
University of Western Ontario
Vanderbilt University

Glomerular Dysfunction: BUN, Creatinine or Urinary Protein Measurement

Dartmouth Medical School
Department of Health and Welfare, Ottawa, Canada
Georgetown University
Harvard Medical School
Indiana University
Medical College of Virginia
Michigan State University
National Institute of Environmental Health Sciences
North Carolina Central University
Schering-Plough Corporation
Southern California Edison Power Company
The Squibb Institute for Medical Research
Stanford University
State University of New York
University of Arkansas
University of Mississippi Medical Center
University of Montreal
University of Ottawa
University of Rochester

Measurement of Glomerular Filtration Rate

Clearance of Inulin, Creatinine, Iothalamate, Diatrizoate, Urea, etc. (Vitamin B_{12} ^{3}H Mannitol, ^{51}Ca Edetic Acid, ^{14}C Nadolol

Dartmouth Medical School
Duke University Medical Center
Georgetown University
Harvard Medical School
ICI Americas, Inc.
Indiana University

GLOMERULAR FUNCTION (concluded)

Medical College of Virginia
Michigan State University
National Institutesof Health
National Institute of Environmental Health Sciences
Smith Kline and French Laboratories
Stanford University
State University of New York, Stony Brook
University of Cincinatti Medical Center
University of Iowa
University of North Carolina
University of Ottawa
University of Pennsylvania
University of Tennessee, Center for the Health Sciences
University of Western Ontario
Vanderbilt University

Disappearance of Iothalamate and Diatrizoate

Dartmouth Medical School
Ohio State University

TUBULAR FUNCTION

Baylor College of Medicine
Dartmouth Medical School
Department of Health and Welfare, Ottawa, Canada
Department of Health and Welfare, Vancouver, Canada
Food and Drug Research Laboratories
Georgetown University
Harvard Medical School
ICI Americas, Inc.
Medical College of Virginia
Michigan State University
Mount Desert Island Biological Laboratories
National Institutesof Health
National Institute of Environmental Health Sciences
North Carolina Central University
Schering-Plough Corporation
Smith, Kline and French Laboratories
Stanford University
State University of New York, Stony Brook
University of Arkansas
University of Cincinnati Medical Center
University of Houston
University of Iowa
University of Mississippi Medical Center
University of Montreal
University of North Carolina
University of Pennsylvania
University of Rochester
University of Tennessee Center for the Health Sciences

Reabsorptive Tests

Measurement of Glucose in Urine

Stanford University
University of Mississippi Medical Center
University of Montreal
University of North Carolina
University of Pennsylvania

Secretive Tests

Urinary Acidification Measurement

University of North Carolina

PAH Transport Maximum Measurement

Dartmouth Medical School
The Squibb Institute for Medical Rsearch

TUBULAR FUNCTION (continued)

In Vitro Evaluation of Renal Transport of PAH, NMN, and TEA

Cortical Slice Technique

Baylor College of Medicine
Food and Drug Research Laboratories
Georgetown University
Michigan State University
National Institute of Environmental Health Sciences
Stanford University
State University of New York, Stony Brook
University of Cincinnati Medical Center
University of Iowa
University of Mississippi Medical Center
University of Montreal

Isolated Perfused Tubules

Food and Drug Research Laboratories
ICI, Americas, Inc.
National Institutes of Health
University of Iowa
University of Rochester

Urinary Concentrating and Diluting Ability

Urine Specific Gravity Measurement

Georgetown University
Harvard Medical School
North Carolina Central University
University of Arkansas
University of Tennessee Center for the Health Sciences

Urine Osmolality Measurement

Dartmouth Medical School
Duke University Medical Center
Food and Drug Research Laboratories
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North Carolina Central University
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TUBULAR FUNCTION (concluded)

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University of Cincinnati Medical Center
University of Iowa
University of Mississippi Medical Center
University of North Carolina
University of Tennessee Center for the Health Sciences
University of Washington

General Tubular Damage (Examination of Urinary Sediments)

Department of Health and Welfare, Ottawa, Canada

MEASUREMENT OF RENAL HEMODYNAMICS

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University of Iowa
University of North Carolina
University of Pennsylvania
University of Tennessee Center for the Health Sciences
University of Western Ontario
Vanderbilt University

Renal Blood Flow Measurement

Plasma Clearance of PAH, Iodohippurate and Iodopyracet

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University of Iowa
University of North Carolina
University of Pennsylvania
University of Tennessee Center for the Health Sciences
University of Western Ontario
Vanderbilt University

Plasma Disappearance of ^{125}I or ^{131}I Orthoiodohippurate

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Food and Drug Research Laboratories
Ohio State University

Measurement of Regional Blood Flow and Intrarenal Distribution of Blood Flow

^{85}Kr- and ^{133}Xe- Washout Measurement

University of North Carolina

BIOCHEMICAL DAMAGE INDICATORS

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Michigan State University
National Institutes of Health
National Institute of Environmental Health Sciences
North Carolina Central University
Schering-Plough Corporation
Southern California Edison Power Company
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State University of New York, Stony Brook
The Squibb Institute for Medical Research
University of Arkansas
University of Ottawa
University of Rochester
University of Washington
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Drug Metabolic Studies

Baylor College of Medicine
Dartmouth Medical School

Plasma Renin Measurement

Duke University Medical Center
Vanderbilt University

Renal Tissue Homogenate Preparations

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Dartmouth Medical School
University of Ottawa
University of Rochester
University of Western Ontario

Urinary Enzyme Activity

Baylor College of Medicine
Environmental Protection Agency
Food and Drug Research Laboratories
Georgetown University

BIOCHEMICAL DAMAGE INDICATORS (concluded)

Urinary Enzyme Activity (concluded)

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National Institutes of Health
National Institute of Environmental Health Sciences
North Carolina Central University
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APPENDIX B

TEST SYSTEMS UTILIZED BY EACH ORGANIZATION

CATS

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University of Pennsylvania

Glomerular Filtration Rate
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University of Pennsylvania

Morphology, Histopathology
University of Houston

Reabsorptive Tests
University of Pennsylvania

Renal Blood Flow
Ohio State University
University of Pennsylvania

Selective Tests
University of Houston
University of Pennsylvania

COWS

Ohio State University

Glomerular Filtration Rate
Ohio State University

Renal Blood Flow
Ohio State University

DOGS

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Glomerular Dysfunction

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University of Iowa
University of Mississippi Medical Center
University of Rochester
University of Tennessee Center for the Health Sciences

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Department of Health and Welfare, Vancover, Canada
Georgetown University
ICI Americas, Inc.
Ohio State University
Smith, Kline and French Laboratories
The Squibb Institute for Medical Research
University of Iowa
University of Pennsylvania
University of Tennessee Center for the Health Sciences

Morphology, Histopathology

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Georgetown University
Schering-Plough Corporation
Smith, Kline and French Laboratories
The Squibb Institute for Medical Research
University of Houston
University of Rochester
University of Tennessee Center for the Health Sciences

Reabsorptive Tests

University of Mississippi Medical Center
University of Pennsylvania
University of Rochester

Renal Blood Flow

Dartmouth Medical School
Georgetown University
ICI Americas, Inc.
Ohio State University
Smith, Kline and French Laboratories
The Squibb Institute for Medical Research
University of Iowa
University of Pennsylvania

DOGS (concluded)

Renal Tissue Homogenate Preparations
Dartmouth Medical School
University of Rochester

Secretive Tests
Dartmouth Medical School
Department of Health and Welfare, Vancouver, Canada
Georgetown University
ICI Americas, Inc.
Smith, Kline and French Laboratories
The Squibb Institute for Medical Research
University of Houston
University of Iowa
University of Mississippi Medical Center
University of Pennsylvania
University of Rochester

Urinary Concentrating and Diluting Ability
Dartmouth Medical School
Georgetown University
ICI Americas, Inc.
Schering-Plough Corporation
University of Iowa
University of Mississippi Medical Center
University of Tennessee Center for the Health Sciences

Urinary Enzyme Activity
Georgetown University
The Squibb Institute for Medical Research

GUINEA PIGS

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Stanford University

Biochemical Damage Indicators
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Drug Metabolic Studies
Dartmouth Medical School

Glomerular Dysfunction
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Harvard Medical School

GUINEA PIGS (concluded)

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Department of Health and Welfare, Vancouver, Canada
Georgetown University
Harvard Medical School

Morphology, Histopathology
Dartmouth Medical School
Georgetown University
Harvard Medical School
Stanford University

Renal Blood Flow
Dartmouth Medical School
Georgetown University

Renal Tissue Homogenate Preparations
Dartmouth Medical School

Secretive Tests
Dartmouth Medical School
Department of Health and Welfare, Vancouver, Canada
Georgetown University
Stanford University

Urinary Concentrating and Diluting Ability
Dartmouth Medical School
Georgetown University
Harvard Medical School

Urinary Enzyme Activity
Georgetown University

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Dartmouth Medical School
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Dartmouth Medical School

Glomerular Dysfunction
Univeristy of Arkansas

HAMSTERS (concluded)

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Dartmouth Medical School

Morphology, Histopathology
Baylor College of Medicine
Dartmouth Medical School
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Univeristy of Arkansas
University of North Carolina

Renal Blood Flow
Baylor College of Medicine
Dartmouth Medical School

Renal Tissue Homogenate Preparations
Baylor College of Medicine
Dartmouth Medical School

Secretive Tests
Baylor College of Medicine
Dartmouth Medical School
University of Arkansas

Urinary Concentrating and Diluting Ability
Dartmouth Medical School

Urinary Enzyme Activity
Baylor College of Medicine
University of Arkansas

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Georgetown University

Glomerular Dysfunction
Duke University Medical Center
Georgetown University

Glomerular Filtration Rate
Duke University Medical Center
Georgetown University

Morphology, Histology
Georgetown University

Plasma Renin Measurement
Duke University Medical Center

Renal Blood Flow
Georgetown University

Secretive Tests
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Georgetown University

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Georgetown University

Urinary Enzyme Activity
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Dartmouth Medical School
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University of Mississippi Medical Center
University of Montreal
University of Pennsylvania
University of Rochester
University of Tennessee Center for the Health Sciences
Universtiy of Western Ontario

MICE (continued)

Biochemical Damage Indicators
ICI Americas, Inc.
National Institute of Environmental Health Sciences
Stanford University
University of Rochester

Drug Metabolic Studies
Baylor College of Medicine
Dartmouth Medical School

Glomerular Dysfunction
Georgetown University
Michigan State University
National Institute of Environmental Health Sciences
Stanford University
University of Arkansas
University of Mississippi Medical Center
University of Montreal
University of Rochester
University of Tennessee Center for the Health Sciences

Glomerular Filtration Rate
Dartmouth Medical School
Georgetown University
ICI Americas, Inc.
Michigan State University
National Institute of Environmental Health Sciences
Stanford University
University of Pennsylvania
University of Tennessee Center for the Health Sciences
University of Western Ontario

Morphology, Histology
Baylor College of Medicine
Georgetown University
National Institute of Environmental Health Sciences
Stanford University
University of Arkansas
University of Mississippi Medical Center
University of Montreal
University of Rochester
University of Tennessee Center for the Health Sciences
University of Western Ontario

Reabsorptive Tests
University of Mississippi Medical Center
University of Montreal
University of Pennsylvania
University of Rochester

MICE (concluded)

Renal Blood Flow
Baylor College of Medicine
Dartmouth Medical School
Georgetown University
ICI Americas, Inc.
University of Pennsylvania
University of Western Ontario

Renal Tissue Homogenate Preparations
Baylor College of Medicine
Dartmouth Medical School
University of Rochester
University of Western Ontario

Secretive Tests
Baylor College of Medicine
Dartmouth Medical School
Georgetown University
ICI Americas, Inc.
Michigan State University
National Institute of Environmental Health Sciences
Stanford University
University of Arkansas
University of Mississippi Medical Center
University of Montreal
University of Pennsylvania
University of Rochester

Urinary Concentrating and Diluting Ability
Dartmouth Medical School
Georgetown University
ICI Americas, Inc.
Michigan State University
National Institute of Environmental Health Sciences
Stanford University
University of Mississippi Medical Center
University of Tennessee Center for the Health Sciences

Urinary Enzyme Activity
Baylor College of Medicine
Georgetown University
National Institute of Environmental Health Sciences
University of Arkansas

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Harvard Medical School
Smith, Kline and French Laboratories
The Squibb Institute for Medical Research

Glomerular Dysfunction
Georgetown University
Harvard Medical School
The Squibb Institute for Medical Research

Glomerular Filtration Rate
Georgetown University
Harvard Medical School
Smith, Kline and French Laboratories
The Squibb Institute for Medical Research

Morphology, Histology
Georgetown University
Harvard Medical School
Smith, Kline and French Laboratories
The Squibb Institute for Medical Research

Renal Blood Flow
Georgetown University
Smith, Kline and French Laboratories
The Squibb Institute for Medical Research

Secretive Tests
Georgetown University
Smith, Kline and French Laboratories
The Squibb Institute for Medical Research

Urinary Concentrating and Diluting Ability
Georgetown University
Harvard Medical School

Urinary Enzyme Activity
Georgetown University
The Squibb Institute for Medical Research

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Department of Health and Welfare, Vancouver, Canada
Duke University Medical Center
Harvard Medical Center
ICI Americas, Inc.
National Institutes of Health
National Institute of Environmental Health Sciences
Stanford University
University of Iowa
University of Mississippi Medical Center
University of Montreal
University of Pennsylvania
University of Rochester
University of Tennessee Center for the Health Sciences
University of Western Ontario

Biochemical Damage Indicators
ICI Americas, Inc.
National Institutes of Health
Stanford University
University of Rochester

Glomerular Dysfunction
Duke University Medical Center
Harvard Medical School
National Institutes of Environmental Health Sciences
University of Iowa
University of Mississippi Medical Center
University of Montreal
University of Tennessee Center for the Health Sciences

Glomerular Filtration Rate
Department of Health and Welfare, Vancouver, Canada
Duke University Medical Center
Harvard Medical School
ICI Americas, Inc.
National Institutes of Health
National Institute of Environmental Health Sciences
University of Iowa
University of Pennsylvania
University of Tennessee Center for the Health Sciences
University of Western Ontario

Morphology, Histology
Harvard Medical School
National Institute of Environmental Health Sciences
Stanford University
University of Montreal
University of Tennessee Center for Health Sciences
University of Western Ontario

RABBITS (concluded)

Plasma Renin Measurement
Duke University Medical Center

Reabsorptive Tests
University of Mississippi Medical Center
University of Montreal
Universtiy of Pennsylvania

Renal Blood Flow
ICI Americas, Inc.
University of Iowa
University of Pennsylvania
University of Western Ontario

Secretive Tests
Department of Health and Welfare, Vancouver, Canada
Duke University Medical Center
ICI Americas, Inc.
National Institutes of Health
Stanford University
University of Iowa
University of Mississippi Medical Center
University of Montreal
University of Pennsylvania

Urinary Concentrating and Diluting Ability
Duke University Medical Center
Harvard Medical School
ICI Americas, Inc.
University of Iowa
University of Mississippi Medical Center
University of Tennessee Center for the Health Sciences

Urinary Enzyme Activity
National Institutes of Health
National Institute of Environmental Health Sciences

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Baylor College of Medicine
Dartmouth Medical School
Duke University Medical Center
Environmental Protection Agency
Food and Drug Research Laboratories
Georgetown University
Harvard Medical School
Department of Health and Welfare, Ottawa, Canada
Department of Health and Welfare, Vancouver, Canada
ICI Americas, Inc.
Indiana University
Medical College of Virginia
Michigan State University
Mount Desert Island Biological Laboratories
National Institute of Environmental Health Sciences
North Carolina Central University
Schering-Plough Corporation
Smith Kline and French Laboratories
Southern California Edison Power Company
The Squibb Institute for Medical Research
Stanford University
State University of New York, Stony Brook
University of Arkansas
University of Cincinnati Medical Center
University of Iowa
University of Mississippi
University of Montreal
University of North Carolina
University of Ottawa
University of Pennsylvania
University of Rochester
University of Tennessee Center for the Health Sciences
University of Washington
University of Western Ontario
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RATS (continued)

Biochemical Damage Indicators
Environmental Protection Agency
Food and Drug Research Laboratories
ICI Americas, Inc.
National Institute of Environmental Health Sciences
North Carolina Central University
Southern California Edison Power Company
Stanford University
State University of New York, Stony Brook
University of Ottawa
University of Rochester
University of Washington

Drug Metabolic Studies
Baylor College of Medicine
Dartmouth Medical School

General Tubular Damage
Department of Health and Welfare, Ottawa, Canada

Glomerular Dysfunction
Dartsmouth Medical School
Department of Health and Welfare, Vancouver, Canada
Duke University Medical Center
Georgetown University
Harvard Medical School
Indiana University
Medical College of Virginia
Michigan State University
National Institute of Environmental Health Sciences
Schering-Plough Corporation
Southern California Edison Power Company
The Squibb Institute for Medical Research
Stanford University
State University of New York, Stony Brook
University of Arkansas
University of Iowa
University of Mississippi Medical Center
University of Montreal
University of Ottawa
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RATS (continued)

Glomerular Filtration Rate

Dartmouth Medical School
Department of Health and Welfare, Vancouver, Canada
Duke University Medical Center
Georgetown University
Harvard Medical School
ICI Americas, Inc.
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Medical College of Virginia
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National Institute of Environmental Health Sciences
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Smith Kline and French Laboratories
The Squibb Institute for Medical Research
Stanford University
State University of New York, Stony Brook
University of Cincinnati Medical Center
University of Iowa
University of North Carolina
University of Ottawa
University of Pennsylvania
University of Tennessee Center for the Health Sciences
University of Western Ontario
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Baylor College of Medicine
Dartmouth Medical School
Department of Health and Welfare, Ottawa, Canada
Environmental Protection Agency
Georgetown University
Harvard Medical School
Indiana University
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National Institute of Environmental Health Sciences
Schering-Plough Corporation
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University of Houston
University of Montreal
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University of Tennessee Center for the Health Sciences
University of Washington
University of Western Ontario

RATS (continued)

Plasma Renin Measurement
Duke University Medical Center
Vanderbilt University

Reabsorptive Tests
University of Mississippi Medical Center
University of Montreal
University of Pennsylvania
University of Rochester

Renal Blood Flow
Baylor College of Medicine
Dartmouth Medical School
Food and Drug Research Laboratories
Georgetown University
ICI Americas, Inc.
Smith Kline and French Laboratories
The Squibb Institute for Medical Research
University of Cincinnati Medical Center
University of Iowa
University of North Carolina
University of Pennsylvania
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Renal Tissue Homogenate Preparations
Baylor College of Medicine
Dartmouth Medical School
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Secretive Tests
Baylor College of Medicine
Dartmouth Medical School
Department of Health and Welfare, Ottawa, Canada
Department of Health and Welfare, Vancouver, Canada
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Food and Drug Research Laboratories
Georgetown University
ICI Americas, Inc.
Medical College of Virginia
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National Institute of Environmental Health Sciences
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RATS (concluded)

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Food and Drug Research Laboratories
Georgetown University
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University of Arkansas

APPENDIX C

INDEX OF INDIVIDUALS IN THE DIRECTORY

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Hook, J.B.	Michigan State University
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Johnson, D.R.	University of Cincinnati Medical Center
Kaloyanides, G.J.	State University of New York, Stony Brook

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Kluwe, W.M.	National Institute of Environmental Health Sciences National Toxicology Program
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Mudge, G.H.	Dartmouth Medical School
Munro, I.C.	Department of Health and Welfare, Ottawa, Ontario, Canada

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Valtin, H.	Dartmouth Medical School
Wiebelhaus, V.D.	Smith Kline and French Laboratories

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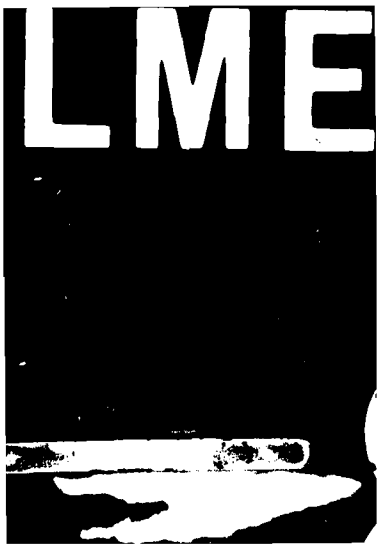
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