

Names _____

Per _____

Rat Dissection Lab

PreAP Biology

Material and diagrams taken and adapted from "An Illustrated Dissection Guide to the Rat" by Allen Kurta, "Rat Dissection Manual" by Bruce D. Wingerd, "Photo Manual and Dissection Guide of the Rat" by Fred Bohensky, and www.biologycorner.com "Rat Dissection"

I. INTRODUCTION

Background:

The Norway rat, *Rattus norvegicus*, belongs to the family Muridae, a large group of rodents that includes the house mouse, gerbil, and hamster. The rat is believed to have originated in Asia and migrated to Europe in the mid-1550s. During the fourteenth century it is estimated that almost half of the population of continental Europe was killed as a result of the "Black Death," or bubonic plague that is carried by rats. Rats are thought to have migrated to North America in the late 1700s after stowing away on ships. In addition to disease, the rat also wreaks havoc on farmer's crops, attacking small animals, etc.

Rats can be beneficial as well. They have allowed for important scientific discoveries in the laboratory environment in the areas of AIDS, cancer, and brain research. They are a valuable research and diagnostic tool due to their anatomical and physiological similarities to the human, high reproductive rate, and ease of maintenance.

Rats and humans belong to Domain Eukarya, Kingdom Animalia, Phylum Chordata, Subphylum Vertebrata, and Class Mammalia. The two primary mammalian characteristics that distinguish them from other vertebrates such as fish, amphibians, birds, and reptiles, is that their skin is covered with hair or fur and they have milk producing mammary glands in the female to nurse the young. Below is the entire classification of the white laboratory rat (a variety of the Norway rat) and humans.

White Rat

Domain—Eukarya
Kingdom—Animalia
Phylum—Chordata
Subphylum—Vertebrata
Class—Mammalia
Order—Rodentia
Family—Muridae
Genus—*Rattus*
Species—*norvegicus*
Variety—*albinus*

Human

Domain—Eukarya
Kingdom—Animalia
Phylum—Chordata
Subphylum—Vertebrata
Class—Mammalia
Order—Primates
Family—Hominidae
Genus—*Homo*
Species—*sapien*

As you can see, rats and humans are similar through Class Mammalia, it is at the Order level where they differ. It is thought that there are probably more species of rodents today than all other mammals combined.

Rats typically begin to breed at 3 months of age and can produce a litter of about 8 young every 21-25 days. The average lab rat's lifespan is about 36 months, whereas rats in the wild typically live about 12-18 months.

Anatomical Terminology

There are many anatomical terms used when referring to organisms. The terms used in this laboratory are for quadrupeds, or four-legged animals like rats, therefore, not all terms are used for bipeds, or two-legged animals such as humans.

Directional Terms:

- Cranial/anterior—toward the head
- Caudal/posterior—toward the tail
- Dorsal—toward the backbone
- Ventral—toward the belly

Planes of Sections:

- Transverse (Cross section)—perpendicular to the long axis of the body
- Sagittal—divides body into right and left halves
- Frontal—divides the body into dorsal and ventral parts

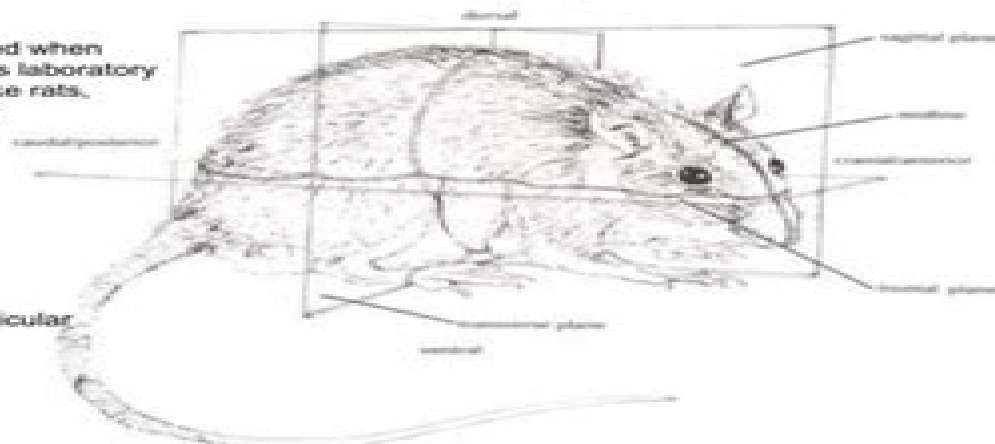


FIGURE N.1. Descriptive terminology and planes of section

Mouse Dissection Lab Report

**Fernando Benavides, Axel Kornerup
Hansen**



Mouse Dissection Lab Report:

The UFAW Handbook on the Care and Management of Laboratory and Other Research Animals Robert C. Hubrecht, James Kirkwood, 2010-01-19 The seminal reference on the care of laboratory and captive animals The UFAW Handbook on the Care and Management of Laboratory and Other Research Animals is a must have for anyone working in this field The UFAW Handbook has been the definitive text since 1947 Written for an international audience it contains contributions from experts from around the world The book focuses on best practice principles throughout providing comprehensive coverage with all chapters being peer reviewed by anonymous referees As well as addressing the husbandry of laboratory animals the content is also of great value to zoos and aquaria Changes for the eighth edition Revised and updated to reflect developments since publication of the previous edition New chapters on areas of growing concern including the 3Rs phenotyping statistics and experimental design welfare assessment legislation training of people caring for lab animals and euthanasia All material combined into one volume for ease of reference This book is published on behalf of UFAW The Universities Federation for Animal Welfare with whom we also publish the UFAW Wiley Blackwell Animal Welfare Book Series This major series of books provides an authoritative source of information on worldwide developments current thinking and best practice in the field of animal welfare science and technology For details of all of the titles in the series see <http://www.wiley.com/go/uaw> **Annual Report** National Cancer Institute (U.S.). Division of Cancer Treatment, 1976 **Rodent Quality Control: Genes and Bugs** Fernando Benavides, Axel Kornerup Hansen, 2024-08-12 This book shows how and why quality assurance programmes should be implemented in laboratory rodent facilities to monitor animal health and genetic status It covers common practice to assure the desired level of microbiological and genetic surveillance of both genetically standardized and genetically altered laboratory mice and rats In particular the book introduces readers to the standardized genetic nomenclature and provides step by step protocols for genetic monitoring of the animals International standards of health monitoring programs are discussed and statistical aspects thereof are explored Furthermore the book reviews common infectious diseases in laboratory rodents and guides the reader in monitoring the animals health status through application of current diagnostic methods This book addresses researchers technicians and zookeepers working in laboratory rodent facilities *Annual Report - National Cancer Institute, Division of Cancer Treatment* National Cancer Institute (U.S.). Division of Cancer Treatment, **The Laboratory Rat** Mark A. Suckow, F. Claire Hankenson, Ronald P. Wilson, Patricia L. Foley, 2019-11-10 The third edition of The Laboratory Rat features updated information on a variety of topics including rats as research models for basic and translational research in areas such as genomics alcoholism diabetes metabolic syndrome obesity neuroscience spinal cord injury traumatic brain injury regenerative medicine and infectious disease New information related to the husbandry and veterinary care of rats is provided including topics related to nutrition reproduction anesthesia and surgery infectious and noninfectious disease and

the care of surgical and other fragile models It is a premier source of information on the laboratory rat this book will be of interest to veterinary and medical students senior graduate students postdocs and researchers who utilize animals in biomedical research New chapters on the care of surgical and fragile models and on the use of rats in research areas such as alcoholism regenerative medicine spinal cord injury traumatic brain injury and others are included All chapters were written by scientific and veterinary experts This book condenses information from many sources on topics related to the care and use of rats in research It is the premier source of information on the laboratory rat *Intramural Research Annual Report* National Institute of Neurological and Communicative Disorders and Stroke,1985 *Annual Report* National Institute of Neurological and Communicative Disorders and Stroke, Intramural Research Annual Report National Institute of Neurological Disorders and Stroke (U.S.),1986 The NIH Record ,1996 **Elements** ,2008 **Genome Research** ,2008

Education and Training in the Care and Use of Laboratory Animals , *Laboratory Animal Medicine* Lynn C. Anderson,Glen Otto,Kathleen R. Pritchett-Corning,Mark T. Whary,2015-07-04 *Laboratory Animal Medicine* Third Edition is a fully revised publication from the American College of Laboratory Medicine s acclaimed blue book series It presents an up to date volume that offers the most thorough coverage of the biology health and care of laboratory animals The book is organized by species with new inclusions of chinchillas birds and program and employee management and is written and edited by known experts in the fields Users will find gold standard guidance on the study of laboratory animal science as well as valuable information that applies across all of the biological and biomedical sciences that work with animals Organized by species for in depth understanding of biology health and best care of animals Features the inclusion of chinchillas quail and zebra finches as animal models Offers guidance on program and employee management Covers regulations policies and laws for laboratory animal management worldwide Scientific and Technical Aerospace Reports ,1980 Lists citations with abstracts for aerospace related reports obtained from world wide sources and announces documents that have recently been entered into the NASA Scientific and Technical Information Database Annual Scientific Report Howard Hughes Medical Institute,1994 *Retinal Degenerative Diseases* Catherine Bowes Rickman,Christian Grimm,Robert E. Anderson,John D. Ash,Matthew M. LaVail,Joe G. Hollyfield,2019-12-28 This book contains the proceedings of the XVIII International Symposium on Retinal Degeneration RD2018 A majority of those who spoke and presented posters at the meeting contributed to this volume The blinding diseases of inherited retinal degenerations have no treatments and age related macular degeneration has no cures despite the fact that it is an epidemic among the elderly with 1 in 3 4 affected by the age of 70 The RD Symposium focused on the exciting new developments aimed at understanding these diseases and providing therapies for them Since most major scientists in the field of retinal degenerations attend the biennial RD Symposia they are known by most as the best and most important meetings in the field The volume presents representative state of the art research in almost all areas of retinal degenerations ranging from cytopathologic physiologic diagnostic and clinical aspects

animal models mechanisms of cell death candidate genes cloning mapping and other aspects of molecular genetics and developing potential therapeutic measures such as gene therapy and neuroprotective agents for potential pharmaceutical therapy While advances in these areas of retinal degenerations were described there will be many new topics that either are in their infancy or did not exist at the time of the last RD Symposium RD2016 These include the role of inflammation and immunity as well as other basic mechanisms in age related macular degeneration several new aspects of gene therapy and revolutionary new imaging and functional testing that will have a huge impact on the diagnosis and following the course of retinal degenerations as well as to provide new quantitative endpoints for clinical trials The retina is an approachable part of the central nervous system CNS and there is a major interest in neuroprotective and gene therapy for CNS diseases and neurodegenerations in general It should be noted that with successful and exciting initial clinical trials in neuroprotective and gene therapy including the restoration of sight in blind children the retinal degeneration therapies are leading the way towards new therapeutic measures for neurodegenerations of the CNS Many of the successes recently reported in these areas of retinal degeneration sprang from collaborations established at previous RD Symposia and many of those were reported at the RD2016 meeting and included in the current volume We anticipate the excitement of those working in the field and those afflicted with retinal degenerations is reflected in the volume **Index Medicus** ,2004 Vols for 1963 include as pt 2 of the Jan issue Medical subject headings **Cumulated Index Medicus** ,1996 **Current Bibliography of Epidemiology** ,1970 Encyclopedia of Animal Rights and Animal Welfare Marc Bekoff,2009-11-25 A landmark publishing achievement on the subject the new edition of this acclaimed encyclopedia is expanded to two volumes covering the full range of issues related to animal protection Expanded to two volumes the comprehensively updated new edition Encyclopedia of Animal Rights and Animal Welfare Second Edition is an extraordinary publishing event It remains the only reference to cover the entire scope of animal rights and welfare from a global interdisciplinary perspective with an international team of contributors assembled by Marc Bekoff covering animal treatment issues in the United States China India Kenya Australia and many other nations With a focused emphasis on fairness and justice for animals evident on every page Encyclopedia of Animal Rights and Animal Welfare Second Edition offers clear explanations of hot button topics like puppy mills endangered species in zoos no kill shelters dog fighting factory farming and disease veganism conservation ethics wildlife contraception and more The encyclopedia also explores a range of religious ethical and philosophical views on using animals as well as the latest research on animal cognition and sentience The work helps readers understand the different viewpoints of animal welfare advocates who want to improve conditions for animals and animal rights activists who don't want animals used at all

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