

A BRIEF HISTORY OF THE PEROMYSCUS GENETIC STOCK CENTER

Wallace D. Dawson

The Peromyscus Genetic Stock Center at the University of South Carolina was established April 1, 1985, under a NSF Biological Resources Program grant. The Stock Center has been continuously supported since that time by NSF, NIH, user fees, and institutional funds. However, the Stock Center has antecedents dating back 90 years. About 1915 Dr. Francis Sumner of Scripps Institute established a laboratory colony of deer mice (*Peromyscus maniculatus*) to study the association of pelage color and natural habitat. Several recessive coat color mutants appeared in his colony, two of which, pink-eye dilute and albino, still exist as direct lineages in the Stock Center. One of Sumner's proteges, Ralph R. Huestis, continued these lines at the University of Oregon and isolated several other mendelian traits, some of which are also still retained in the Stock Center. In the 1930's, Lee R. Dice initiated extensive studies of *Peromyscus* at the University of Michigan. At Michigan several additional monogenic traits were identified that modified coat color, morphology and behavior. Sumner's and Huestis's stocks were also perpetuated at Michigan. Dice and his associates additionally developed two "wild-type" closed colony stocks of *Peromyscus*: the BW stock of *P. maniculatus* and the PO stock of *P. polionotus*. These wild-type stocks, as well as some of the monogenic mutant stocks, eventually were assimilated into the colony that became the foundation for the Stock Center.

William McIntosh was a Ph.D graduate student who worked with Dice in the late 1940s, and subsequently assumed a faculty position at Ohio State University where he established an extensive *Peromyscus* colony that existed from 1954 until 1962. I was a graduate student at Ohio State at this time working with McIntosh and was using both *P. maniculatus* and *P. polionotus*. Upon receiving my degree in 1962 I joined the faculty of the University of South Carolina. My research start-up consisted of a dozen galvanized metal mouse cages with water bottles and \$50 for mouse chow. I soon obtained an in-house grant of \$400 to buy additional cages and supplies. Initially I maintained only the two wild-type stocks mentioned above and about four of the coat color mutants that I thought could be studied by a hoped-for graduate student. My first grad student, Mike Maddock, soon joined me and he did some work on gene

interactions among the coat color stocks. My entire animal facility was located in a small two-room penthouse atop the then new Life Sciences Building. I was given space for about 120 cages in one of these rooms shared between the Biology Department and the College of Pharmacy. The facility also housed laboratory mice (*Mus*) and rats (*Rattus*) and rabbits, and sometimes other small vertebrates. From the beginning I maintained meticulous breeding records of all of the *Peromyscus* following the example of Bill McIntosh as he had learned it from Lee Dice. These records still exist in the Stock Center archives.

By 1964 I had received my first NIH grant to study hormonal differences between *P. maniculatus* and *P. polionotus*, and their hybrids. This and related work on hormone growth effects was the focus of much of my research over the next several years, but I remained primarily interested in speciation and genetics. By the late 1960s I had established a correspondence with Ralph Huestis who was about to retire and wanted to pass his stocks of *Peromyscus* to me to accept "in trust". Among these were several mutant stocks that Huestis had identified and, also, some of Sumner's mutant stocks. We accepted these and continued to maintain the additional mutations. Fortunately, by 1970 an additional animal facility had been renovated in the adjacent Science Annex Building. The colony was housed in this building until 1999. Not long afterward Harold Egoscue of Utah State sent us stocks of several mutant deer mice he had identified. During the late 1960s and 1970s we began to utilize electrophoresis to identify and analyze the protein genetic polymorphisms in our stocks, and, with graduate students and others, published several papers. Our interest was focused on developing additional genetic markers to advance the gene map of *Peromyscus*. We also experimented with artificial insemination and conducted some studies of prenatal development of interspecific hybrids. We temporarily kept small numbers of *P. floridanus*, *P. truei*, *P. gossypinus* and *P. leucopus*, none of which were retained as continuing stocks. Unfortunately, much of our work during this interval was of limited interest to NIH and NSF. NSF funds for *Peromyscus*-related research were being directed to field studies, and NIH showed preference for more traditional animal models. By 1977 there remained only Michigan State University, University of Michigan and the University of South Carolina holding significant pedigreed stocks of *Peromyscus* in a laboratory setting. After a sabbatical at the Smithsonian in 1979, I initiated discussions with John A. "Jack" King of Michigan State and Morris Foster at Michigan about forming a consortium to maintain laboratory stocks of *Peromyscus*. However, because of Dr. Foster's death and Dr. King's approaching retirement, the consortium idea was abandoned.

In the early 1980s the National Academy of Science sponsored a study of laboratory animal resources and recognized that many long-established collections of lab animals were being abandoned because of increasing costs of animal care and higher maintenance standards for facilities. The report warned that potentially valuable laboratory animal resources were being lost, and recommended greater federal support for animal resources. NSF responded to this in the mid 1980s by increasing funding for non-traditional animal species. We applied, initially without success, for funding from NSF in 1984, but re-wrote the proposal and it was funded in 1985 and has been continuously funded since that time. Federal funding from NIH began in 1998 largely in response to the role of *Peromyscus* in two emerging diseases of concern, Lyme and hantavirus.

The first three years of the Stock Center were disappointing as it was underutilized, but by 1990, with the encouragement of James Edwards, then acting program officer at NSF, and significantly more funding, utilization greatly increased. For about six years beginning in 1990 a satellite Center was established at the University branch campus at Aiken SC under the direction of Dr. Suellen Van Ooteghem. Back-up stocks of the coat color mutants and all of the behavior mutants were maintained at that location. The Aiken Center was not cost effective and was closed in 1996.

Beginning in the mid-1980s the Stock Center began establishing permanent wild-type stocks of other species of *Peromyscus*. These included *P. californicus*, *P. eremicus*, *P. melanophrys*, *P. aztecus* and *P. leucopus*. Also, highly inbred lines of both *P. maniculatus* and *P. leucopus* were added.

A major factor in the success of the Stock Center was the selection of Janet Crossland as Colony Manager. Since its inception in 1985 she has been, and continues to be, a key factor in the management of the Center. She established cordial relationships with Stock Center clients located in nearly all of the U.S. states and several foreign countries. She supervises virtually every aspect of the day-to-day operation of the Center. She also handles much of the training of new personnel and student helpers. Since the Stock Center was established four post-doctoral researchers, ten graduate students and innumerable undergrads have assisted in its functions both as clerical and technical helpers and/or as researchers. Many scientists have visited the Center and utilized its resources on site.

In 1999 the Stock Center animals were moved into a new state-of-the-art animal facility located in the new Graduate Science Center on campus. The associated laboratory and administrative offices were moved to the same building the following year. Following my retirement in 1999, Michael "Mike" Dewey assumed directorship of the Stock Center. Mike, a member of the South Carolina faculty since 1978, had extensive experience with laboratory mice (*Mus*) and was director of the mouse transgenic facility on campus. He also had served on the Stock Center's Departmental Oversight Committee for several years. I moved to St. Louis, but remained as a consultant and editor of *Peromyscus Newsletter*. I am relinquishing both positions. Of course, I will continue to follow the progress of the Stock Center. Mike Dewey has introduced new technologies to the Center and greatly enhanced its research capabilities and brought his own talents to the Center. With continued support by the faculty and administration of the University, and continued external grant funding, the *Peromyscus* Genetic Stock Center should thrive and remain a valuable asset.

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Peromyscus Genetic Stock Center

Personnel:

Director: Wallace D. Dawson (1985-1999)
 Director: Michael J. Dewey (1999 -)
 Colony Manager: Janet P. Crossland (1985-)
 Director Aiken SC Stock Center: Suellen Van Ooteghem (1990-1997)
 Director of Animal Care: Robert Beattie DVM (1987-2005)
 Principle Animal Caretakers: Charlotte Joyner, Derrick Thompson, Jeff Attlesey, Ginger Peters

PeroBase

Personnel:

John Rose PI (1997-)	External <i>PeroBase</i> Advisory Committee (1998)
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Michael Dewey Co-PI (1999-)	Janan Eppig
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Paige Meeker, Files management (1997-2000)	
Andrew Pushlar, Preliminary site design (1997-1999)	
Steve Collins, Data entry (1999-2004)	
Melanie Haynes, Data entry (1999-2002)	
Angela Dicks, Data entry (1999-2000)	
Janet Crossland, Staff Assistant and Manager (1986 -)	

PEROMYSCUS NEWSLETTER

Staff:

Wallace Dawson, Editor (1986 – 2005)
 Oscar Ward, Associate Editor (1987 – 1996)
 Craig Stewart, Co-editor (1997-1999)
 Melanie Haynes, Co-editor (2000-2001)
 Julie Weston, Associate Editor (2004-)
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Committee Chair 1990 - 1994)
Suellen VanOoteghem, Wright State University and Westinghouse Corporation (1985 - 1991)
Lee R.G. Snyder, University of California Riverside (1985)
Joseph H. Nadeau, Jackson Laboratory (1986 - 1990)
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Kelly Lambert, Randolph-Macon College (2002 - 2004)
Mark Lewis, University of Florida (2002 - 2004)
Kimberly Hammond, University of California Riverside (2003 -)
Pierre Rollin, Centers for Disease Control, Atlanta (2004 -)
Sabra Klein, Johns Hopkins School of Public Health (2004 -)
David Hale, HQ US Air Force Academy (2004 -)

Ex officio:

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Michael Dewey, University of South Carolina (2000 -2005)
Suellen VanOoteghem, Department of Energy and West Virginia University (1991 - 1997)
Oscar G. Ward, University of Arizona (1986 - 1994)

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Elizabeth Horner, Smith College (1988)

¹Present or former members of the U.S. National Academy of Science

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Michael R. Felder
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Jerry Hilbish
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Lu En-yu
Fred Marsteller
Zongren Wang
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Cathy Dodson
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Michael Foster
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Bert Ely
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Loren Knapp
Joseph Quattro
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