

FALL 1999, No. 479

INSIDE:

MOUSE MODELS 2

- New Models for Diabetes and Free Radical Research
- New *Scid* Model

CUSTOMER RELATIONS 2

- Dr. Jeff Lake Heads New Facility at UC Davis
- New Manager of JAX® Custom Breeding Services
- New Technical Support Representative

JACKSON LABORATORY RESEARCH NEWS 4

- *moth1* Gene Protects Tubby Mice from Hearing Loss
- New Method for Intravenous Injection in Neonatal Mice
- Selected Publications

COURSES & CONFERENCES YEAR 2000 5

- Titles and Dates

JAX® MICE WEB SITE HIGHLIGHTS 6

- Animal Health Reports
- Updated PDF Files of our Mouse Model Lists
- Easy-to-Search JAX® Mice Database
- Site Map to Find Information on the JAX® Mice Web Site
- Frequently Asked Questions

QUESTIONS & ANSWERS 6

- How do you adapt JAX® Mice to automatic watering systems?
- What strategies are recommended for managing allergies to laboratory animals?

CONTACT INFORMATION 8

- JAX® Mice Orders & Support
- Web Sites
- Research Affiliates Program

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KEN PAIGEN INITIATES SEARCH FOR NEW JACKSON LABORATORY DIRECTOR

Dr. Kenneth Paigen, Director of The Jackson Laboratory since May 1989, announced that he has asked the Laboratory's Board of Governing Trustees to begin the search for a new director.

"I am proud of what The Jackson Laboratory has accomplished these last ten years," Dr. Paigen said. "But there comes a time when new leadership is appropriate. I care deeply about this institution and want the transition to the next director to be a successful one."

"Ken Paigen has done a spectacular job as Director of the Laboratory over the past decade," said David Shaw, chairman of the Laboratory's Board and President and CEO of IDEXX Laboratories. "He now feels that the time has come to seek a successor who will guide the Laboratory into the next chapter of its history, and that it is important that this be done in a manner that minimizes any impact on the progress of the Laboratory."

Dr. Paigen, who turned 72 in November, plans to remain as Director until a successor is hired. "I do not plan to retire," Dr. Paigen noted. "I want to continue as an active scientist here at the Laboratory and pursue some projects I've had on hold."

Dr. Paigen has gained international recognition for his distinguished career in genetics and his pioneering work in biochemical genetics. He completed his undergraduate

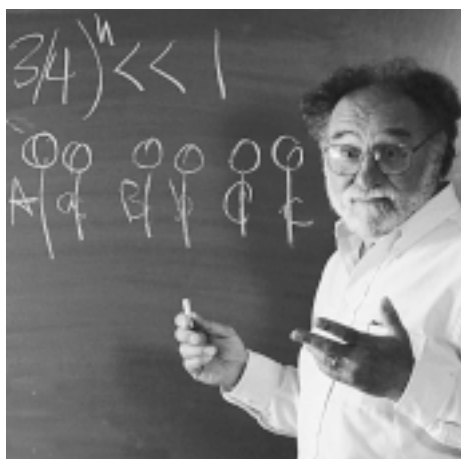
studies in biology at Johns Hopkins University and earned his Ph.D. in biochemistry at the California Institute of Technology. Prior to coming to The Jackson Laboratory, Dr. Paigen held postdoctoral appointments at Cold Spring Harbor, Harvard, and Berkeley then held faculty and departmental chair positions at both the Roswell Park Memorial Institute in Buffalo, New York and the University of California at Berkeley. He has authored more than 100 scientific papers. ●

JAX RESEARCH SYSTEMS IS Y2K COMPLIANT

We are pleased to announce that the order processing, shipping, and animal support systems of JAX Research Systems (the division of The Jackson Laboratory that distributes JAX® Mice) are considered to be Year 2000 compliant. Our working committee, comprised of senior management, implemented a strategy to address all internal and external Year 2000 related issues. We assigned the highest priority to those processes related to mouse production and distribution programs. The critical issues were identified, appropriate remediation and contingency procedures were implemented, and systems were tested as the final phase of compliance.

In addition, the Laboratory Emergency Management Team conducted a 9-9-99 Event Exercise on the evening of September 8, 1999. Starting at 12:00 AM (EST), testing was carried out on all building automation, communication, computing, and energy systems supporting our animal production and distribution programs. No failures of any critical operating systems were detected.

If you have any questions about the status of our Year 2000 compliance, please contact V. S. McFarland, Jr., Risk Management Officer, at (207) 288-6119, e-mail at vsm@jax.org, or by fax at (207) 288-6297. ●



Above: Dr. Paigen is world renowned as a professor, scientist, and leader in the biomedical research community

Customer Relations

DR. JEFF LAKE HEADS NEW FACILITY AT UC DAVIS

As part of the recently formed research collaboration between The Jackson Laboratory's JAX Research Systems (JRS) and the University of California at Davis (UCD), a laboratory animal facility on the UCD campus is being renovated for shared occupancy by UCD and JRS. JRS employee, Jeffrey Lake, PhD, has been appointed as the Manager of this facility. The JRS portion of the facility, which is scheduled to be operational by early 2000, will be used primarily for custom breeding projects for West Coast research institutions, including UCD.

Dr. Lake formerly headed our JAX® Mice Technical Support group and during the previous twenty years has held various research and facility management positions at Emory University in Atlanta and Washington University in St. Louis. As Facility Manager of JRS at UCD, Dr. Lake will oversee operations and be responsible for ensuring the quality of the JAX® Mice bred and distributed from this facility. Dr. Lake brings to this position knowledge and experience in facility management, mouse biology, genetics, and animal husbandry.

Ms. Deborah Lake will serve as the JRS facility's Manager of Production Colony, Targeted

(continued on page 3)

Mouse Models

NEW MODELS FOR DIABETES AND FREE RADICAL RESEARCH

Inbreeding of Swiss-derived ICR mice in Japan produced the well-known NOD strain, a model for autoimmune type I insulin dependent diabetes mellitus, and the related NON strain, a model for pre-type II non-insulin dependent diabetes. More recently, Japanese investigators have inbred CrJ:CD-1 (ICR) mice with simultaneous selection toward high and low incidences of alloxan-induced diabetes (Ino *et al.*, 1991). This selection produced two new inbred strains, named ALS (Alloxan Susceptible) and ALR (Alloxan Resistant). Alloxan spontaneously decomposes to generate toxic free radicals and selectively destroys pancreatic β cells. Both inbred strains were imported by Dr. Edward Leiter (Lt) at The Jackson Laboratory in 1996. ALS/Lt and ALR/Lt mice were transferred to The Jackson Laboratory production colonies for distribution in 1998 (ALS/LtJ, Stock No. 003072; ALR/LtJ, Stock No. 003070).

These new strains should be of interest to investigators across a wide range of scientific disciplines. The ALR mouse, in particular, is of unusual interest because of its resistance to a variety of diabetogenic stresses. This resistance correlates with a systemic elevation in constitutively-expressed levels of molecules (glutathione) and enzymes (superoxide dismutase, glutathione peroxidase, glutathione reductase, and catalase) commonly associated with defense against free radical-mediated damage (Mathews and Leiter, 1999a, b).

Not only are ALR/Lt mice of both sexes remarkably resistant to alloxan-induced diabetes, they also exhibit increased resistance to multiple low doses of streptozotocin, another potent alkylating diabetogen. ALR pancreatic islets are remarkably resistant to free radical stress *in vitro* (Mathews and Leiter, 1999b). Further, ALR islets are resistant to cytolysis induced by combinations of cytokines that destroy ALS and NOD islets. Because of immunogenetic similarities to the related NOD strain (see below), ALR islets could

be used as targets for NOD-derived cytotoxic T lymphocytes (CTL). Such CTL that destroy NOD islets *in vitro* and *in vivo* do not lyse ALR islets *in vitro* (Mathews *et al.*, 1999).

Genetic comparisons of ALR/Lt and ALS/Lt recently conducted at The Jackson Laboratory (over 600 polymorphic microsatellite markers compared) extend preliminary genetic comparisons performed in Japan (Sekiguichi *et al.*, 1990). The ALR/Lt genome is closely related to NOD/Lt while the ALS/Lt genome is more closely related to that of NON/Lt.

This relatedness is evident when comparing major histocompatibility complex (MHC) haplotypes (Table 1, page 3). ALS mice share the $H2^{nb1}$ haplotype with NON/Lt mice. The MHC haplotype of ALR mice is closely-related to the $H2^{g7}$ haplotype of NOD, with ALR/Lt differing only at the distal region of the complex. The ALR/Lt haplotype has been designated $H2^{bx}$ (Graser *et al.*, 1999). This haplotype is shared with CTS/Shi, another NOD-related, but diabetes-resistant strain (Mathews *et al.*, 2000). The ALR/Lt mice, which have normal numbers of peripheral T cells, can be used with NOD/Lt as a diabetes-resistant control strain. In contrast, the CTS/Shi mice have severely reduced numbers of T cells and can be difficult to obtain.

In addition to MHC similarity, ALR/Lt is identical to NOD in terms of microsatellite markers at numerous other chromosomes defining diabetes-susceptibility regions. Thus, the differences in MHC between these two closely-related strains should allow further dissection of the separate immunopathogenic contributions of MHC genes within the $H2^{g7}$ complex.

Unpublished studies at The Jackson Laboratory show that these new models also hold considerable interest to researchers interested in obesity-associated diabetes. ALR/Lt males and females, as well as ALS/Lt males develop a moderate adult-onset obesity. Despite the increased adiposity, alloxan-untreated ALR/Lt mice of both sexes maintain normal glucose and insulin tolerance. The ALS/Lt male, like the NON/Lt male, becomes glucose-intolerant after

puberty. NON/Lt males do not become hyperinsulinemic as they age and only gradually develop mild obesity. In contrast, ALS/Lt males maintained on a 6% fat diet, and not treated with alloxan, develop impaired glucose tolerance by 7 weeks of age, become extremely hyperinsulinemic by 10-12 weeks of age. Hence, different aspects of pre-type II diabetes are reflected by these two related strains.

Table 1: MHC haplotypes of related ICR-derived strains*

H2 locus	K	A	E	D
ALR/LtJ	<i>d</i>	<i>g^l</i>	<i>null</i>	<i>dx</i>
NOD/LtJ	<i>d</i>	<i>g^l</i>	<i>null</i>	<i>b</i>
ALS/LtJ	<i>b</i>	<i>nb1</i>	<i>k</i>	<i>b</i>
NON/LtJ	<i>b</i>	<i>nb1</i>	<i>k</i>	<i>b</i>

*This information supercedes information published in previous JAX Notes No. 475.

Research Applications

The remarkable ability of ALR/LtJ tissues and cells to dissipate toxic free radicals should interest a variety of scientists involved in toxicology, chronic metabolic diseases and their complications. Further, the close relatedness of this autoimmune diabetes-resistant strain to NOD/LtJ should make ALR/LtJ mice a valuable control strain for immunologic studies in NOD/LtJ mice. Finally, the propensity of both ALS/LtJ and the closely-related NON/LtJ males to develop pre-type II diabetes makes this pair of strains valuable to researchers studying the genetics and pathophysiology of obesity and type II diabetes.

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- Mathews CE *et al.* ALR/Lt mice: B cell resistance to chemical and autoimmune attack associated with increased anti-oxidant defenses. 1999 *Diabetes* 48 (Suppl 1):A450-A451.
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NEW SCID MODEL

A new *scid* model, NOD/LtSz-*Prkdc^{scid}* *B2m^{tm1Unc}/J* (Stock No. 002570), is available in **limited quantities**. This strain was generated by backcrossing the Class I deficient *B2m* targeted mutation on to the NOD/LtSz-*Prkdc^{scid}* strain. Characteristics of this strain are summarized in Table 2.

Availability: Very limited due to inherent breeding difficulties. Studies to develop new breeding strategies are ongoing. Call Customer Service for more information.

Control Strains: NOD/LtJ (Stock No. 001976) and NOD/LtSz-*Prkdc^{scid}*/J (Stock No. 001303).

Table 2: Summary of Characteristics of NOD/LtSz-*Prkdc^{scid}* *B2m^{tm1Unc}/J* strain

- Absence of MHC Class I
- Loss of NK cell activity
- Absence of protective Fc receptor
- Hemachromatosis
- Improved engraftment with human peripheral blood lymphocytes
- Normalization of CD4/CD8 ratio
- Supports engraftment with primitive human stem cells that self renew as shown by secondary transfer

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- Author in bold indicate Jackson Laboratory scientist
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 - Peled A *et al.* 1999. Dependence of human stem cell engraftment and repopulation of NOD/SCID mice on CXCR4. *Science* 283:845-848.

Customer Relations

Genomics Unit. Ms. Lake has over twenty years experience in mouse colony management and most recently has managed colonies of mice with induced mutations (e.g., transgenics, "knockouts") at The Jackson Laboratory.

NEW MANAGER OF JAX® CUSTOM BREEDING SERVICES

The Jackson Laboratory provides custom breeding services, including: creating special crosses, breeding and colony maintenance, strain rederivation, and mouse embryo cryopreservation. Our new Manager of Custom Breeding Services, Alicia Valenzuela, is responsible for working with customers to define parameters of special breeding projects, providing price quotes, and project oversight.

Ms. Valenzuela has spent the past two years as a JAX® Mice Technical Support Representative and previously worked for several years as a biomedical research professional. Ms. Valenzuela brings to this new position a wealth of knowledge related to JAX® Mice strains, mouse genetics, mouse biology, molecular biology, genetic crosses, and genetic quality control. If you are interested in using JAX® Custom Breeding Services, please contact Jackson Laboratory Customer Service at tel: 1-800-422-MICE or 207-288-5845; fax: 207-288-6150.

(continued on page 4)

Customer Relations

NEW TECHNICAL SUPPORT REPRESENTATIVE

Jen Merriam, ScM is our new JAX® Mice Technical Support Representative. She joins us most recently from The Jackson Laboratory's Mouse Genome Informatics group where she served as a Database Curator. Ms. Merriam has a background in molecular and cellular biology as well as in genomic bioinformatics.

EDUCATIONAL WALL CHART ON: GENE TARGETING WITH 129 STRAINS



A new wall chart on *Gene Targeting with 129 Strains* is now available from The Jackson Laboratory. This educational poster provides information on *in vitro* gene targeting, generating ES cell lines, creating congenic and coisogenic strains, stabilizing targeted mutations on single genetic backgrounds, and the coat colors associated with various backcross generations of 129 strains. Call 1-800-422-MICE or 207-288-5845 for a complimentary copy or complete and return the enclosed business reply card.

Jackson Laboratory Research News **moth1 GENE PROTECTS TUBBY MICE FROM HEARING LOSS**

Tubby mice (C57BL/6J-*tub/tub*, Stock No. 000562) experience maturity-onset obesity, hyperinsulinemia, and insulin resistance. They also exhibit vision and hearing loss (Heckenlively *et al.*, 1995; Ohlemiller *et al.*, 1995). The *tub* mutation induces progressive apoptotic death of photoreceptor cells. Hearing problems in tubby mice usually develop by three weeks of age with cochlear degeneration due to a progressive loss of hair cells and neurons occurring later.

The tubby phenotype is the result of a spontaneous single base change in a splice donor site leading to an amino acid substitution in a transcript encoding a novel gene product (Noben-Trauth, *et al.*, 1996; Kleyn *et al.*, 1996). The biological function of the gene and the mechanisms by which it induces its diverse phenotype remain to be determined.

Quantitative trait locus (QTL) analysis identified a chromosomal region that prevents deafness in tubby mice (Ikeda, *et al.*, 1999). QTL analysis for hearing ability was carried out in progeny from genetic crosses of [C57BL/6J-*tub/tub* and AKR/J-+/+] F1 hybrids (AKR intercross) and [C57BL/6J-*tub/tub* and CAST.B6-*tub/tub*] F1 hybrids (CAST intercross). A major QTL, designated modifier of tubby hearing 1 (*moth1*) was identified on Chromosome 2. The presence of this modifier gene protects tubby mice from hearing loss.

It is hypothesized that C57BL/6J mice carry a recessive mutation of the *moth1* gene that interacts with the *tub* mutation to cause hearing loss in tubby mice. AKR/J, CAST/Ei, and 129P2/OlaHsd (based on a C57BL/6 congenic carrying the *moth1*-containing segment of Chr 2 from 129P2/OlaHsd) inbred strains all appear to carry a wildtype protective allele of *moth1*.

Identification of the *moth1* gene product may have direct implications for treatment of specific types of hereditary deafness in humans. "Understanding 'natural' gene interactions that can delay or suppress hearing loss may provide a blueprint for creating therapeutics," says Dr. Patsy Nishina, Staff Scientist at The Jackson Laboratory.

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Authors in bold indicate Jackson Laboratory scientists

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- Noben-Trauth K, **Naggert JK**, North MA, **Nishina PM**. 1996. A candidate gene for the mouse mutation tubby. *Nature* 380:534-538.
- Ohlemiller KK, Hughes RM, Mosinger-Ogilvie J, Speck JD, Grosos DH, Silverman MS. 1995. Cochlear and retinal degeneration in the tubby mouse. *Neuroreport* 6:845-849. ●

NEW METHOD FOR INTRAVENOUS INJECTION IN NEONATAL MICE

Drs. Mark Sands, Washington University School of Medicine, and Jane Barker, Senior Staff Scientist at The Jackson Laboratory, have developed a simple, noninvasive percutaneous (through the skin) method for intravenous injection into neonatal mice. This method allows delivery of a variety of agents, including cells, viruses, or drugs, into the bloodstream of the mouse.

Using this method, intravenous injections, in volumes up to 100 µl, are made through the superficial temporal vein. This vein is prominently located on either side of the head, just below the eye, traveling back towards the jugular vein. The temporal vein is visible in mice from newborn through 4 days of age. Injection via this route becomes more difficult as the mouse grows because of repositioning of the vein in all strains and increasing pigmentation in non-albino strains.

Intravenous delivery of agents via the tail vein of adult mice provides a simple and effective method for testing the effects of these agents in whole animals. However, in many cases it is necessary or desirable to manipulate the internal environment of a mouse prior to an age when these techniques can be used. This new technique (*i.e.*, allowing intravenous injection in newborn mice) greatly expands the ability to study the effects of specific agents in numerous mouse models.

Reference

Author in bold indicates Jackson Laboratory scientist

- Sands MS, **Barker JE**. 1999. Percutaneous intravenous injection in neonatal mice. *Lab Anim Sci* 49:328-330. ●

SELECTED PUBLICATIONS AUTHORED BY JACKSON LABORATORY SCIENTISTS

Authors in bold indicate Jackson Laboratory scientists

Dermatological Research

- Freyschmidt-Paul P, **Sundberg JP**, Happle R, **McElwee KJ**, Metz S, **Bogges D**, Hoffmann R. 1999. Successful treatment of alopecia areata-like hair loss with the contact sensitizer squaric acid dibutylester (SADBE) in C3H/HeJ Mice. *J Invest Dermatol* 113:61-68.

- Stenn KS, **Sundberg JP**. 1999. Hair follicle biology, the sebaceous gland, and scarring alopecias. *Arch Dermatol* 135:973-974.

Developmental Biology

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Diabetes and Obesity Research

- Trembleau S, Penna G, Gregori S, **Chapman HD**, **Serreze DV**, Magram J, Adorini L. 1999. Pancreas-infiltrating Th1 cells and diabetes develop in IL-12-deficient nonobese diabetic mice. *J Immunol* 163:2960-2968.

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Genetics Research

- **Anagnostopoulos AV**. 1999. It's a knockout! *Trends Genet* 15:379-380.
- **Knowles BB**. 1999. Princeton mouse genomics conference report, Princeton University, Princeton NJ, USA. *Transgenic Res* 8:317-318.

(Selected Publications continued on page 6)

COURSES & CONFERENCES YEAR 2000

- 3rd International Nomenclature Workshop
Dates: May 31 - June 4
- Course on Mouse Embryo Handling
Dates: May 10 - 12
- Course on Cryopreservation of Mouse Germplasm
Dates: May 15 - 19
- Course on *in vitro* Fertilization with Mice
Dates: May 22 - 23
- Northeast Contaminants Workshop (co-sponsored by Marine Environmental Research Institute)
Dates: June 22 - 25
- Mouse Initiatives II: Making New Mouse Mutants for Human Disease
Dates: to be announced
- 41st Annual Short Course in Medical and Experimental Genetics
Dates: July 16 - 30
- Genetics of Aging
Dates: August 6 - 10
- Graduate Course in Experimental Genetics of the Laboratory Mouse in Cancer Research
Dates: August 20 - 31
- Genetic Approaches to Complex Heart, Lung and Blood Disease
Dates: September 8 - 17
- Molecular Biology of Chromosome 21 and Down's Syndrome
Dates: September 23 - 26

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JAX® MICE WEB SITE HIGHLIGHTS (www.jax.org/jaxmice)

Did you know that the JAX® Mice Web Site has:

ANIMAL HEALTH REPORTS

JAX® Mice are bred within and shipped from multiple breeding rooms, all located on The Jackson Laboratory campus. Each room houses a different set of strains of JAX® Mice.

Animal health reports are sent with all shipments of JAX® Mice and are also available on our Web site (go to www.jax.org/jaxmice; select "Animal Health and Genetic Quality" from the Main Menu; select "Health Status by Room"). These reports are updated monthly and organized on the basis of the shipping room of origin, which is also generally the breeding room of origin.

UPDATED PDF FILES OF OUR MOUSE MODEL LISTS

All of our mouse model lists have been updated as of October, 1999. You can view and print these documents by visiting our Web site (go to www.jax.org/jaxmice; select "JAX® Mice Library" from the main menu; select "Mouse Model Lists").

EASY-TO-SEARCH JAX® MICE DATABASE

This database contains a wealth of the most current information on JAX® Mice prices, stock numbers, availability, genotypes, gene names, controls, applications, and much more. Check it out at www.jax.org/jaxmice/pricelist.

(continued on page 7)

Neurobiology Research

• Fletcher CF, Frankel WN. 1999. Ataxic mouse mutants and molecular mechanisms of absence epilepsy. *Hum Mol Genet* 8:1907-1912.

Reproductive Biology Research

• Joyce IM, Pendola FL, Wigglesworth K, Eppig JJ. 1999. Oocyte regulation of kit ligand expression in mouse ovarian follicles. *Dev Biol* 214:342-353.

Sensorineural Research

• Chang B, Hawes NL, Roderick TH, Smith RS, Heckenlively JR, Horwitz J, Davisson MT. 1999. Identification of a missense mutation in the α A-crystallin gene of the lop18 mouse. *Mol Vision* 5:21-25.

• Hawes NL, Smith RS, Chang B, Davisson M, Heckenlively JR, John SWM. 1999. Mouse fundus photography and angiography: a catalogue of normal and mutant phenotypes. *Mol Vision* 5:22-29. •

Questions and Answers

FREQUENTLY ASKED QUESTIONS ABOUT JAX® MICE

Q How do you adapt JAX® Mice to automatic watering systems?

A JAX® Mice are maintained in a variety of caging systems at The Jackson Laboratory, all of which use bottles as the water source. Some institutions receiving JAX® Mice use automatic watering systems. Most of the time, JAX® Mice adapt to this new system without difficulty.

However, in some cases, animal care technicians or researchers may notice rapid weight loss, dehydration, or failure to eat. If mice are not drinking, they tend to stop eating, creating additional problems. It is important to closely monitor all recently received mice to ensure they are adapting to their new environment. Any visible problems need to be corrected quickly to assure the health and well being of the mice.

The following are some suggestions for mice experiencing difficulty adjusting to

an automatic watering system:

- Tap the water valve so that a small bead of water forms on the surface. Most mice will find this water and realize that this is their new water source.
- If mice don't find the watering valve, place a water bottle on the cage or put a small container of water in the bottom of the cage. Alternatively, transfer mice to a cage with a water bottle for a short period of time. After a few days, remove the alternate water source and make another attempt at adapting the mice to the automatic watering system.
- Place semi-moist food or a gel pack in the cage until the mice locate the water nozzle.

Very young or recently weaned mice (*i.e.*, shipped within 24 hours of weaning) may be more prone to experiencing problems adjusting to a new watering system. The ability to adapt may also be strain dependent. For instance, anecdotal evidence suggests that some NZB/BINJ mice experience difficulty adapting to a new water source. •

Q What strategies are recommended for managing allergies to laboratory animals?

A Animal care personnel, researchers, and technicians who work with laboratory animals are often at risk of developing allergies. Considered a common and significant occupational disease, laboratory animal allergy (LAA) has been observed to affect as many as one-third of personnel exposed to animals and may lead to serious health consequences if not managed appropriately.

Carolyn Reeb-Whitaker, Senior Research Assistant with The Jackson Laboratory Allergy Research Group, and Fuzz Harrison, Industrial Hygienist at the Laboratory, recently published an overview of LAA that includes recommended strategies and methods to help manage the problem. (Reeb-Whitaker and Harrison, 1999).

Simply put, an allergy can be described as an abnormal sensitivity to a substance (an allergen) that is normally tolerated by exposed individuals and generally considered harmless. Allergic reactions may include contact urticaria (skin redness or itchiness, welts, hives), allergic conjunctivitis and rhinitis (sneezing, itchiness, nasal drainage, nasal congestion), asthma, and the spectrum of anaphylactic reactions.

Allergenic proteins found in common laboratory animals such as mice are present in urine, hair, dander, saliva, and serum. Urine is the most significant source of allergen in the mouse.

Humans are exposed to animal allergens primarily through the air (inhalation) and skin contact. A less common yet significant route of exposure is animal bites (saliva), which can elicit anaphylaxis in hypersensitive individuals. Multiple factors influence the risk of developing LAA including individual genetic susceptibility, and the intensity, duration, and frequency of exposure.

Medical evaluation of employees prior to contact with laboratory animals as well as ongoing medical surveillance, is recommended. Timely screening can identify individuals at higher risk of developing LAA and allow the employer to educate individuals about the risks of LAA and develop a control strategy prior to onset of allergic symptoms. Ongoing medical surveillance is crucial in order to identify individuals who have become allergic, to provide appropriate medical support, and to monitor status. An effective medical surveillance program, coupled with environmental monitoring, is fundamental for characterizing and quantifying the scope (and cost) of the problem.



Above: Cheryl MacLean, Jackson Laboratory Animal Care Technician, is shown wearing protective clothing.

Employee education and training is an important factor for reducing the risk of allergy development. Once an allergic individual becomes symptomatic, controlling exposure may not be adequate or feasible to manage symptoms. Although only about 10% of allergic individuals develop asthma, people with severe allergic symptoms ultimately may have to be reassigned to new positions which eliminate exposure to animals.

Reducing exposure to animal allergens has proven to reduce symptoms and to decrease the incidence of LAA. The following recommendations include strategies and methods that should be considered for managing LAA and for weighing costs and feasibility against the negative health, morale, and financial impact of LAA.

Personal Protective Equipment and Personal Hygiene

- Change of clothes prior to entering the animal room and the use of laboratory coats, scrubs, hair bonnets, shoe covers, and gloves.
- Use of respiratory protection as necessary and appropriate examples include the half-face disposable mask (dust/mist), half-face or full-face mask with HEPA filter, and the air helmet or air hat (powered air-purifying respirator, or PAPR).
- Shower facilities for workers to use after removing protective equipment and prior to leaving work.
- Handwashing after handling any animals and prior to leaving animal room.

(FAQs continued on page 8)

JAX® Mice Web Site Highlights

All the following charts are available to view and print as PDF files by going to www.jax.org/jaxmice; select "Price List & Product Guide"; select "Download PDF Files"; scroll down to the end of the "Table of Contents" list and choose the appendix of interest (see the appendices listed below):

- Cross Reference Chart of Former Gene/Allele Symbols to Cloned Gene Symbols
- Body Weights for Selected Strains of JAX® Mice
- Coat Color and Appearance for Commonly Used Mice With Spontaneous Mutations
- Mouse Models for Human Disease: Mouse/Human Gene Homologs
- Major Histocompatibility Complex, *H2* Haplotypes

SITE MAP TO FIND INFORMATION ON THE JAX® MICE WEB SITE

Our "Site Map" provides a list of all information areas under each "Main Menu" heading within the JAX® Mice Web site. You can view this "Site Map" at any time by selecting "Site Map" located at the top of the left hand, gray "Main Menu" bar and above the word "Menu".

FREQUENTLY ASKED QUESTIONS (FAQs)

FAQs address several subjects including: ordering JAX® Mice and services, husbandry issues, Web forms, and additional information (e.g., nomenclature, definitions, controls, etc.). See FAQs by selecting "Technical Support" from our "Main Menu".

CONTACT INFORMATION

JAX® MICE

Ordering & Customer Service

Tel: 800.422.MICE or 207.288.5845
 Fax: 207.288.6150

Technical Support

Tel: 800.422.MICE or 207.288.5845
 Fax: 207.288.6150
 email: micetech@jax.org

Field Support

Craig Gladstone
 Tel: 207.288.6029
 Fax: 207.288.6150
 email: ceg@jax.org

Barbara Witham
 Tel: 207.667.3815
 Fax: 207.667.3865
 email: baw@jax.org

Jim Boardman
 Tel: 630.548.0946
 Fax: 630.548.0956
 email: jimb@jax.org

Support for Investigators Donating New Strains

Steve Rockwood
 (Candidate Strain
 Submission)
 Tel: 207.288.6437
 Fax: 207.288.6150
 email: sfr@jax.org

Phyllis Mobraaten
 (Status of Strains in
 Importation)
 Tel: 207.288.6247
 Fax: 207.288.6150
 email: pam@jax.org

WEB SITES

JAX® MICE
www.jax.org/jaxmice

JAX® Mice Searchable
 Database
[www.jax.org/jaxmice/
 pricelist](http://www.jax.org/jaxmice/pricelist)

Induced Mutant Resource
[www.jax.org/resources/
 documents/imr](http://www.jax.org/resources/documents/imr)

RESEARCH AFFILIATES PROGRAM

MaryEllen Joseph
 (Manager)
 Tel: 207.288.6188
 Fax: 207.288.6152
 email: mej@jax.org

Peter Johnson, PhD
 (Scientific Liaison)
 Tel: 207.288.6316
 Fax: 207.288.6152
 email: psj@jax.org

Merlene McIntire
 (Administrative Assistant)
 Tel: 207.288.6270
 Fax: 207.288.6152
 email: mgm@jax.org

Research Affiliates Web Site: www.jax.org/industrial/index.html

JAX NOTES™

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Share Your Ideas:

If you would like a special topic addressed in a future issue of *JAX Notes*, please contact Megan Macauley with your idea (tel: 207-288-6446; fax: 207-288-6150; email: mjm@jax.org).

Mailing List:

If you would like to be added to the *JAX Notes* mailing list, please contact Customer Service using the contact information above or complete and return the enclosed business reply card.

Engineering Controls

- Validation of room ventilation performance for effectiveness in removing airborne contaminants.
- Use of local exhaust ventilation for cage changing and mouse handling (fume hood, laminar flow cabinet, etc.).
- Installation of air locks or suitable barriers to separate facility zones (i.e., animal facility, laboratory research, and administrative).
- Effective humidity control in the animal room.
- Use of ventilated caging systems to reduce ambient allergen levels.

Administrative Controls and Work Practices

- Establishment of animal room density limits based on ventilation capacity.
- Use of filter cage tops for conventional, non-ventilated cages.
- Implementation of wet cleaning methods (floors, walls, fixtures, equipment, and animal racks) and vacuuming.
- Reduction of dry-broom sweeping.
- Minimization of animal transport.
- Use of covered carriers containing fresh bedding when transporting animals.
- Alternative bedding (low dust, non-contact, etc.).
- Implementation of a comprehensive employee education and training program for LAA.

Reference

Authors in bold indicate Jackson Laboratory scientists

- **Reeb-Whitaker CK, Harrison DJF.** 1999. Practical management strategies for laboratory animal allergy. *Lab Animal* 28:25-30. ●