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JAX | NOTES™

CHARLES RIVER AND THE JACKSON LABORATORY COOPERATE IN THE INTERNATIONAL SUPPLY OF MOUSE RESEARCH MODELS

In July 2001, The Jackson Laboratory and Charles River Laboratories International, Inc. entered into an international cooperative relationship to supply The Jackson Laboratory's JAX® Mice to biomedical researchers located in European and Pacific Rim countries (see Table 1). Effective on August 1, 2001, this new relationship is intended to enhance the availability of JAX® Mice around the world. Charles River now serves as our import and distribution agent in the countries listed below for all JAX® Mice strains. In addition, Charles River will breed for distribution selected high demand JAX® Mice strains under Jackson's guidance, in local Charles River breeding facilities in Europe and Japan.

The process of establishing and expanding JAX® Mice breeding colonies (along with conducting all required health and genetic quality testing) at international Charles River breeding facilities will require a few months. Both Charles River and The Jackson Laboratory will keep you updated with our progress on these activities.

There are no plans for Charles River to breed low demand repository strains in their international breeding facilities. The Jackson Laboratory will continue to serve as an international repository as well as a strain development, characterization, breeding and distribution center for mouse models. •

Table 1. Countries in which Charles River distributes JAX® Mice

Continental Europe, Ireland & United Kingdom		Scandinavia	Asia & Pacific Rim
Austria	Italy	Denmark	China
Belgium	Luxembourg	Finland	Japan
The Czech Republic	The Netherlands	Norway	Korea
France	Portugal	Sweden	Taiwan
Germany	Spain		
Hungary	Switzerland		
Ireland	United Kingdom		

THE JACKSON LABORATORY PROVIDES AID TO TEXAS SCIENTISTS SUFFERING RESEARCH SETBACKS FROM DISASTROUS FLOOD

The Jackson Laboratory has come to the aid of research colleagues in Houston, Texas, in the wake of tropical storm Alison, which poured 28 inches of rain on the area. Baylor College of Medicine alone lost an estimated 35,000 mice in the aftermath of the devastating flood.

The Jackson Laboratory initiated a process to work with our customers in the Houston area to reroute, postpone or cancel orders for JAX® Mice. Customer Service Representatives have been dedicated to work with these customers to meet their immediate needs. Jackson Laboratory teams are working on more than 50 projects to provide JAX® Mice to researchers in the Houston area.

Michael Blackburn, Ph.D., of the University of Texas Health Science Center was one of many researchers to lose precious mice as a result of the flooding. Fortunately, he sent two breeder pairs of his partially adenosine deaminase mutant mice, which are used to study inflammatory lung diseases, to collaborators in New York. At the time of the flood, the two males had died and the two remaining females were 11 months of age, well beyond prime breeding age. At this point, Dr. Blackburn began working with Jackson Laboratory Staff Scientist and

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JAX® | GEMM™ S

Genetically Engineered and Mutant Mice

We are pleased to announce the following newly available strains. For ordering information, please contact Customer Service by email at orderquest@jax.org or call 800-422-MICE or 207-288-5845.

B6.129S1-Grik2^{tm1Sfh}

Stock Number: 003616

Standard Supply: Level 4*

Applications: Studies in neurobiology: epilepsy, neurotransmitter receptor and synaptic vesicle defects.

STOCK TgN(NES-TVA)12Hev

Stock Number: 003529

Standard Supply: Level 4*

Applications: Research tools: developmental biology, genetics research (tissue/cell markers: glial cells), and neurobiology research.

B6.129-Il2rg^{tm1Wjl}

Stock Number: 003174

Standard Supply: Level 4*

Applications: Studies in cancer research and immunology and inflammation research.

B6.Cg(SJL)-TgN(NesCre)1Kln

Stock Number: 003771

Standard Supply: Level 4*

Applications: Research tools: Cre-lox system and genetics research (mutagenesis and transgenesis).

B6.129P2-Tnfrsf6^{tm1Osa}

Stock Number: 003233

Standard Supply: Level 4*

Applications: Studies in apoptosis, hematology, immunology, inflammation, and internal/organ research.

B6.129-Penk-rs^{tm1Pig}

Stock Number: 002880

Standard Supply: Level 4*

Applications: Studies in neurobiology research: behavioral and learning defects.

B6;129X-Snca^{tm1}

Stock Number: 003692

Standard Supply: Level 4*

Applications: Studies in neurobiology: neurodegeneration research.

B6.129S7-Bmp7^{tm1Kry}

Stock Number: 003783

Standard Supply: Level 4*

Applications: Studies in developmental biology. •

*Level 4: Up to 3 breeder pairs or 6 individual mice per order total

PERSONALIZED COMMUNICATIONS ON NEW JAX® MICE STRAINS—COMING SOON!

To help ensure that the JAX® Mice information we send to you is relevant and useful, we have developed a new system to help us communicate with you on a more personalized basis. We are now able to capture information that you chose to share with us about your research interests and use that information routinely to notify you of relevant new JAX® Mice strains and new strains in development.

If you have not already done so, we encourage you to complete our on-line

Customer Needs & Interests Profile (go to www.jax.org/jaxmice and select "research interests" from the home page text). Be assured that we treat this information with the utmost confidentiality and use it to provide you with enhanced service and personalized communications based on your research interests.

Be sure to watch for JAX® News Briefs coming soon by e-mail or postal mail (depending on the communications preference indicated on your submitted *Customer Needs & Interests Profile*). •

Visit us at our booth!

THE JACKSON LABORATORY TRADESHOW SCHEDULE

The 2001 Biomedical Research Equipment and Supplies
 Exhibit at Harvard Medical School
 September 19–20
 Boston, MA

NIH Research Festival
 October 4–5
 Bethesda, MD
<http://festival01.nih.gov/>

American Society of Human Genetics Annual Meeting
 October 13–15
 San Diego, CA
<http://www.ashg.org/genetics/ashg/meet-2001/2001meetmenu.htm>

International Mouse Genome Conference
 October 21–24
 Edinburgh, Scotland
<http://www.imgc2001.com>

AALAS National Meeting
 October 21–25
 Baltimore, MD
<http://www.aalas.org/>

Society for Neuroscience Annual Meeting
 November 11–14
 San Diego, CA
<http://www.sfn.org/>

American Society for Cell Biology Annual Meeting
 December 9–12
 Washington, DC
<http://www.ascb.org/>

Mouse Models News

MOUSE MODELS EXPRESSING FLUORESCENT PROTEINS

Fluorescent proteins have recently emerged as popular reporter molecules with many biological applications. First isolated from the jellyfish *Aequorea victoria* as Green Fluorescent Protein (GFP), the original structure of the protein has been altered, resulting in significant improvements including enhanced fluorescence intensity and shifts in the wavelength emitted when excited (i.e., different colors!). The Jackson Laboratory has available or under development a growing number of strains employing fluorescent proteins including GFP, Cyan Fluorescent Protein (CFP), and Yellow Fluorescent Protein (YFP) as shown in Table 2.*

Table 2. JAX® Mice Strains Expressing Fluorescent Proteins

Strain Name	Stock Number	Standard Supply Level	Reported Site(s) of Expression
STOCK TgN(ActbECFP)1Nagy	003773	Level 4*	ubiquitous
B6.Cg-TgN(Thy1-CFP)23Jrs	003710	Level 4*	neuronal-specific
STOCK TgN(ActbEYFP)1Nagy	003772	Level 4*	ubiquitous
B6.Cg-TgN(Thy1-YFP)16Jrs	003709	Level 4*	neuronal-specific
B6.Cg-TgN(Thy1-YFP)2Jrs	003782	Level 4*	neuronal-specific
STOCK Tg(ACTB-Bgeo/GFP)21Lbe	003920	Under Development	CRE reporter
129S6-Tg(Prnp-GFP/Cre)1Blw	003960	Under Development	kidney
C57BL/6-TgN(ACTbEGFP)1Osb	003291	Level 3*	ubiquitous
FVB/N-TgN(GFAPGFP)14Mes	003257	Level 4*	astrocytes, Muller cells
FVB/NJ-TgN(GFPU)5Nagy	003516	Under Development	ubiquitous
STOCK TgN(GFPU)5Nagy	003115	Level 3a*	ubiquitous
STOCK TgN(GFPX)4Nagy	003116	Cryopreserved	ubiquitous
FVB-TgN(GadGFP)45704Sw	003718	Under Development	GABAergic neurons
FVB/N-TgN(TIE2GFP)287Sato	003658	Level 3*	blood vessel, endothelial cells

*Standard Supply Levels

Level 3: Up to 10 mice of each sex can be shipped per order per month.

Level 3a: Up to 3 breeder pairs or 10 individual mice can be shipped per order. Expected delivery is 1 to 3 months.

Level 4: Up to or 6 individual mice per order total; 1 order at a time. Expected delivery is 1 to 6 months.

EXTENDED LIFE SPAN IN MICE WITH DWARFING MUTATIONS

Single gene mutations found to extend life span serve as invaluable tools for the exploration of the molecular basis of age-related changes in cell and tissue function and in the pathophysiology of age-dependent diseases. Mice with mutations that lead to a dwarfed body size, Ames dwarf (*Prop1^{df}*), dwarf (*Pit1^{dw}*), and little (*Ghrhr^{lit}*), all exhibit increased longevity. Recent research by Jackson Laboratory Researcher Kevin Flurkey Ph.D. *et al.* (2001) elucidates some of the underlying mechanisms associated with the extended life span seen in dwarf mice.

Mice homozygous for loss-of-function mutations at the *Pit1*, pituitary specific transcription factor 1, (dwarf) locus exhibit a greater than 40% increase in longevity (1,178 ± 235 days vs. 832 ± 158 days for controls) in both males and females on a C3DWF1 (C3H/HeJ x

DW/J) genetic background. The effects of aging on T-cell subsets and tail tendon collagen cross-linking are also delayed.

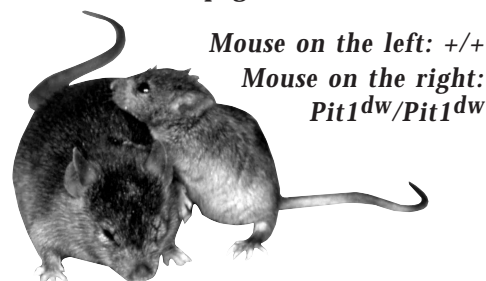
Tail collagen cross-linking was examined as an index of age-dependent change in extracellular macromolecules. Dwarf mice exhibit a slowed age-dependent change in collagen denaturation time. At 16-19 months of age, dwarf mice showed a 3.2-fold slower collagen denaturation time than control mice.

T-lymphocyte status was examined as an indicator of changes in an age-sensitive cellular compartment. Aging leads to an increase in the proportion of both CD4 and CD8 cells expressing the CD44 surface marker typical of the memory T-cell population in most mouse strains. DWC3F1 control mice exhibit an increase in the proportion of

CD4 and CD8 splenic cells as they age from 3-7 months to 27-29 months of age, whereas dwarf mice do not.

PIT1 protein is required for the differentiation of hormone-specific cell types in the anterior pituitary. Dwarf mice produce defective PIT1 that fails to activate either growth hormone or prolactin genes. As a result, dwarf mice produce very little growth hormone, prolactin and thyroid-stimulating hormone, with a resulting decrease in the levels of thyroid hormones and insulin-like growth factor 1. Transplantation of normal pituitary glands into dwarf mice can return prolactin to physiological, or greater, levels. However, this procedure does not reverse the life span effect, suggesting that the

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Mouse on the left: +/+
 Mouse on the right: *Pit1^{dw}/Pit1^{dw}*

JAX® MICE WEB SITE HIGHLIGHTS

www.jax.org/jaxmice

Mouse Information Resources

The “Search for Mouse Information” page has been redesigned to clearly outline the existing resources available and new resources have been added. At the top of this page (choose “search for mouse information” from the sidebar menu) is a bulleted list of the information types available. Below this, both pre-existing links and new links are well organized to help easily determine what information resource to choose. A new section, “external helpful links” provides a growing resource of useful mouse information found on other Internet Web sites.

Gene & Strain Nomenclature

This page (choose “gene & strain nomenclature” from the sidebar menu) has been better organized and updated recently to include the latest strain nomenclature revisions. A cross-reference chart of former gene/allele symbols to cloned gene symbols is updated monthly. Links to past JAX® Notes and JAX® Bulletins relevant to gene and strain nomenclature updates can be found on this page.

JAX® Mice Online Data Sheets

The JAX® Mice Database contains information on over 2500 mouse models, and this information is displayed in online data sheets. These data sheets also contain a wealth of links to information relevant to a particular strain. Links to phenotypic data, genotyping protocols, diet information, and animal health reports found in a data sheet are rapid ways to find more information specific to the strain in question. Also, an “additional Web information” section on the data sheet provides links to general information on a strain-by-strain basis.

For more information on accessing a strain data sheet on-line, see the Frequently Asked Questions on page 7. •

Nomenclature News

129 NOMENCLATURE UPDATE

Targeted mutagenesis is most often carried out using embryonic stem (ES) cell lines derived from 129 mice. Efficiency of gene targeting is highly dependent upon using the same 129 substrain as the source of the ES cells. Creation of a truly coisogenic strain carrying the targeted mutation also requires that the host 129 substrain be matched to that of the ES cell line.

In 1999, the names of the substrains of 129 were modified to reflect their relationships to one another. Each substrain is now identified by a unique combination of one of four letters and a number preceding the slash in its name. The letter indicates the 129 subtype to which the strain belongs: P for “Parental”; S for “Steel”; and T for “Ter” (teratoma susceptible). X designates a substrain that was genetically contaminated early in its history and differs significantly from other 129 strains; this substrain, 129X1/SvJ, was the source of the RW-4 ES cell line (See “129X1/SvJ Genetically Contaminated. What Does That Really Mean?” JAX Notes No. 481, February 2001).

Frequently, a targeted mutation generated in 129 ES cells is transferred onto another inbred strain background by repeated backcrossing to the host strain. The correct name of such a congenic strain begins with the abbreviated name of the host strain, followed by a period (.) and the abbreviated name of the strain that donated the chromosome segment containing the gene of interest. For example, a strain congenic for a DNA segment from DBA/2J on the C57BL/6J background would be called B6.D2-. The full names of the 129 substrains, some of which are long and complicated, can be abbreviated by “129” followed by the strains’ unique letter-number pairs (*i.e.*, 129X1). This makes congenic nomenclature both clear and simple. It also permits easy distinction among 129 substrains in publications, once the abbreviations have been defined.

When the new 129 substrain nomenclature became effective, the name 129S3/SvImJ was assigned to the strain formerly known as 129/SvImJ (Stock Number 002448). This strain was originally developed as a control strain for mice generated from many of the 129-steel derived ES cell lines (*e.g.*, W9.5 and CJ7). In 1995, Stock Number 002448 was made by breeding the steel Jackson mutation out of a population of 129S1/Sv-^{+P} +^{Tyr-c} *Kitl*^{SIJ/+} (Stock Number 000090), then at F26. The resulting strain was initially named 129/Sv-^{+P} +^{Tyr-c} +^{Kitl-SI}/J (Stock Number 002448; see Simpson *et al*, 1997), which was later shortened to 129/SvImJ. Designated 129S3/SvImJ in 1999 (Festing *et al*, 1999), this strain was renamed 129S1/SvImJ in February, 2001 to emphasize its relationship to Stock Number 000090. SSLP marker analysis indicates that 129S1/SvImJ is identical to 129S1/Sv-^{+P} +^{Tyr-c} *Kitl*^{SIJ/+} at all markers tested throughout the genome except for the region surrounding the *Kitl* gene on Chr 10. (*Kitl*, kit ligand, was formerly called *Mgf*, mast cell growth factor. For more information about this nomenclature change, please see “*Mgf* gene name changes to *Kitl*.” JAX Notes No. 481, February 2001.)

For more information about the revised nomenclature of 129 mice please refer to JAX Bulletin No. 1 (June 30, 1999—revised June 2001), available online at <http://jaxmice.jax.org/html/nomenclature/129nomenclature.pdf>.

REFERENCES

Authors in bold are Jackson Laboratory scientists.

Simpson EM, **Linder CC**, **Sargent EE**, **Davisson MT**, **Mobraaten LE**, Sharp JJ. 1997. Genetic variation among 129 substrains and its importance for targeted mutagenesis in mice. *Nat Genet* 16:19-27.

Festing MF, Simpson EM, **Davisson MT**, **Mobraaten LE**. 1999. Revised nomenclature for strain 129 mice. *Mamm Genome* 10:836. •

THE JACKSON LABORATORY COURSES & CONFERENCES AUTUMN 2001

- Genetic Approaches to Complex Heart, Lung and Blood Disease
Dates: September 7–16
- Workshop on Mouse Molecular Neurogenetics
Dates: September 12–15
- Short Course on Mathematical Approaches to the Analysis of Complex Phenotypes
Dates: September 30–October 7
- Genomics Meets NanoScience
Dates: October 9–14
- Modeling Human Prostate Cancer in Mice
Dates: October 18–21
- Cryopreservations–In Vitro Fertilization
Dates: October 21–26
- Colony Management
Dates: November 15–17

For more information, contact the Office of Courses and Conferences at:

Tel: 207-288-6262
Fax: 207-288-6080
Email: education@jax.org
Web Site: <http://www.jax.org/courses>

SELECTED PUBLICATIONS AUTHORED BY JACKSON LABORATORY SCIENTISTS

Authors in bold indicate Jackson Laboratory scientists

BIOINFORMATICS

Hill DP, Davis AP, Richardson JE, Corradi JP, Ringwald M, Eppig JT, Blake JA. Strategies for biological annotation of mammalian systems: implementing gene ontologies in mouse genome informatics. *Genomics* 2001; 74:121-128.

Kerr MK, Churchill GA. Statistical design and the analysis of gene expression microarray data. *Genet Res* 2001; 77:123-128.

CARDIOVASCULAR BIOLOGY RESEARCH

Hsieh E, Zhou YF, Paigen B, Johnson TM, Burnett MS, Epstein SE. Cytomegalovirus infection increases development of atherosclerosis in Apolipoprotein-E knockout mice. *Atherosclerosis* 2001; 136:23-28.

Purcell MK, Mu J-L, Higgins DC, Elango R, Whitmore H, Harris S, Paigen B. Fine mapping of Ath6, a quantitative trait locus for atherosclerosis in mice. *Mamm Genome* 2001; 12:495-500.

DEVELOPMENTAL BIOLOGY RESEARCH

Viveiros MM, Hirao Y, Eppig JJ. Evidence that protein kinase C (PKC) participates in the meiosis I to meiosis II transition in mouse oocytes. *Dev Biol* 2001; 235:330-342.

DIABETES AND OBESITY RESEARCH

Ablamunits V, Bridgett M, Duffy T, Haag F, Nissen M, Koch-Nolte F, Leiter EH. Changing patterns of cell surface mono (ADP-ribosyl) transferase antigen ART2.2 on resting versus cytopathically-activated T cells in NOD/Lt mice.

Diabetologia 2001; 44:848-858.

Tisch R, Wang B, Atkinson MA, Serreze DV, Friedline R. A glutamic acid decarboxylase 65-specific Th2 cell clone immunoregulates autoimmune diabetes in nonobese diabetic mice. *J Immunol* 2001; 166:6925-6936.

GENETICS RESEARCH

Frankel WN, Taylor L, Beyer B, Tempel BL, White HS. Electroconvulsive thresholds of inbred mouse strains. *Genomics* 2001; 74:306-312.

Goodwin NC, Ishida Y, Hartford S, Wnek C, Bergstrom RA, Leder P, Schimenti JC. DelBank: a mouse ES-cell resource for generating deletions. *Nat Genet.* 2001; 28:310-1.

Sundberg JP, King LE, Bascom C. Animal models for male pattern (androgenetic) alopecia. *Eur J Dermatol* 2001; 11:321-5.

Sundberg JP, King LE. Morphology of hair in normal and mutant laboratory mice. *Eur J Dermatol* 2001; 11:357-61.

NEUROBIOLOGY RESEARCH

Beierbach E, Park C, Ackerman SL, Goldowitz D, Hawkes R. Abnormal dispersion of a Purkinje cell subset in the mouse mutant cerebellar deficient folia (cdf). *J Comp Neurol* 2001; 436:42-51.

Ikeda A, Ikeda S, Gridley T, Nishina PM, Naggert JK. Neural tube defects and neuroepithelial cell death in Tulp3 knockout mice. *Hum Molec Genet* 2001; 10:1325-1334.

OSTEOPOROSIS RESEARCH

Beamer WG, Shultz KL, Donahue LR, Churchill GA, Sen S, Wergedal JR, Baylink DJ, Rosen CJ. Quantitative trait loci for femoral and lumbar vertebral bone mineral density in C57BL/6J and C3H/HeJ inbred strains of mice. *J Bone Miner Res* 2001; 16:1195-1206. •

Mouse Models News

NEW POLYGENIC TYPE 2 DIABETES MODEL DEVELOPED

TallyHo is a newly established mouse strain developed and characterized in the laboratory of Dr. Jürgen Naggert, Staff Scientist at The Jackson Laboratory (Kim *et al.*, 2001). TallyHo mice resemble human non-insulin-dependent type 2 diabetes mellitus (NIDDM).

Male mice develop hyperglycemia, hyperinsulinemia, hyperlipidemia, moderate obesity, and enlargement of the islets of Langerhans. Onset of hyperglycemia is delayed compared to *ob/ob* (B6.V- *Lep^{ob}*) and *db/db* (BKS.Cg-*m +/+ Lepr^{db}*) mice beginning between 10 to 14 weeks of age. Female mice display moderate hyperinsulinemia, hyperlipidemia, and obesity but do not manifest overt diabetes (*i.e.* hyperglycemia).

The TallyHo (TH) strain originated from two outbred Theiler Original male mice showing polyuria and glucosuria. Selective inbreeding of mice based on the hyperglycemia phenotype was used to establish the strain, currently F₇. Genomic scans using 92 SSLP markers distributed throughout the genome detected no residual heterozygosity in TallyHo mice.

Chromosomal mapping identified a major diabetes susceptibility locus on Chr 19, designated *Tanidd1* for TH-associated NIDDM. Breeding and map-

ping data suggest *Tanidd1* is a single recessively inherited gene primarily responsible for the hyperglycemia phenotype in TallyHo mice.

Genome scans of backcross progeny from (C57BL/6J x TH)F₁ and TH mice or (CAST/Ei x TH) F₁ and TH mice reveals a complex pattern of inheritance and gene-gene interactions between *Tanidd1* and other loci including *Tanidd2* on Chr 13, *Tanidd3* on Chr 16, *Tabw* (TallyHo-associated body weight) on Chr 7; and *Tafat* (TallyHo-associated fat pad) on Chr 4.

In summary, TallyHo mice represent an important new model for the genetic dissection and study of human NIDDM and obesity. Male mice exhibit an overt diabetes phenotype that is not present in female mice. Genetic analysis identified a major diabetes locus, *Tanidd1* that appears to be a recessively-inherited genetic mutation leading to overt hyperglycemia in conjunction with other obesity loci.

CURRENT AVAILABILITY

TallyHo mice (Stock No. 004149) are currently maintained in Dr. Naggert's



TallyHo (Stock Number 004149)

TallyHo mice represent an important new model to study Type 2 diabetes.

research colony. Small numbers of mice and breeder pairs will be distributed upon request, please direct inquiries to our Customer Service Department. A larger distribution colony of TallyHo mice will be established if there is significant demand from the research community.

REFERENCES:

Authors in bold are Jackson Laboratory scientists.

Kim JH, Sen S, Avery CS, Simpson E, Chandler P, Nishina PM, **Churchill GA**, Naggert JK. 2001. Genetic analysis of a new mouse model for non-insulin-dependent diabetes. *Genomics*. 74(3):273-286.*

Career Opportunities

The Jackson Laboratory is undergoing a number of program expansions providing career opportunities for Biomedical Technologists, Research Assistants, Animal Technologists and Bioinformatics Specialists. For specific openings, please refer to our Web site at www.jax.org/careeropps/ or e-mail us at jobs@jax.org.



Send résumés to:

600 Main Street

Bar Harbor, ME 04609-1500

Questions and Answers

FREQUENTLY ASKED QUESTIONS ABOUT JAX® MICE

Q *When do mice become sexually mature and when does their reproductive performance decline?*

A The age at which females first become pregnant varies by strain from 6-8 weeks of age. Most inbred females exhibit reduced fecundity by 8-10 months of age. Males become sexually mature slightly later than females. Males can remain fertile throughout their lives, but older obese or sedentary males are not likely to breed.

Q *Where can I find the most current information on H2 haplotypes?*

A The most up-to-date H2 haplotype information can be found in our 2001 Catalog (page 481). Our catalog is available in a printed version and on-line at: <http://jaxmice.jax.org/html/pricelist/section14.appendixIII.pdf>. H2 haplotype data is also provided on strain data sheets in the JAX® Mice Database.

Q *How can I find strain data sheets (i.e., product specifications) on the JAX® Mice Web site?*

A Visit the JAX® Mice Database (<http://jaxmice.jax.org/index.shtml>). Click on "Search" for JAX® Mice. Perform your query. For example, type C57BL/6J in the Strain Name only field and click on the Search Database button. From the table

of items returned, click on C57BL/6J to view the product specifications.

Q *What can I expect to see on a strain data sheet?*

A The information on strain data sheets varies by strain. Fields may include common name(s), H2 haplotype, appearance, strain description, phenotypic data, strain development, diet, research applications, references, pricing, standard supply levels, supply notes, licensing, contact information for Technical Information and Customer Service, as well as links to animal health reports, genotyping protocols, and additional web information.

Q *How can I obtain an Animal Health Report?*

A JAX® Mice *Animal Health Reports* are available by calling Customer Service and from the JAX® Mice Web site. From the Main Menu, select "Animal Health and Genetic Quality," then select "Health Status by Room." Links to *Animal Health Reports* are available from strain data sheets for JAX® Mice strains shipped from our production facilities. •

EXTENDED LIFE SPAN CONTINUED

effect is not due to lower levels of prolactin. Nevertheless, the hormonal basis for life span extension is supported further by the increased longevity observed in homozygous mutant little mice, which express an abnormal form of growth hormone releasing hormone receptor.

Caloric restriction leads to life span extension in many strains of genetically unaltered mice. Male dwarf mice, unlike calorically restricted mice, become obese and exhibit proportionately high leptin levels in old age, indi-

cating that their longevity is not due to alterations in adiposity.

Single gene dwarfing mutations have been shown to postpone fatal diseases and extend life span. It is thought that this is caused by a deceleration of a wide range of age-dependent processes. Further studies of dwarf mice should provide new insights into the hormonal regulation of senescence, longevity, and diseases that manifest late in life.

REFERENCES:

Authors in bold indicate Jackson Laboratory scientists

Brown-Borg HM, Borg KE, Meliska CJ, Bartke A. Dwarf mice and the ageing process. *Nature* 1996; 384:33.

Camper SA, Saunders TL, Katz RW, Reeves RH. The Pit-1 transcription factor gene is a candidate for the murine Snell dwarf mutation. *Genomics* 1990; 8:586-590.

Flurkey K, Papaconstantinou J, Miller RA, **Harrison DE**. Lifespan extension and delayed immune and collagen aging in mutant mice with defects in growth hormone production. *Proc Natl Acad Sci U S A* 2001; 98:6736-41.

Lin SC, Lin CR, Gukovsky I, Lusia AJ, Sawchenko PE, Rosenfeld MG. Molecular basis of the little mouse phenotype and implications for cell type-specific growth. *Nature* 1993; 364:208-213.

Miller RA. Age-related changes in T cell surface markers: a longitudinal analysis in genetically heterogeneous mice. *Mech Ageing Dev* 1997; 96:181-96.

Miller RA, (1995) in Handbook of Physiology: Section 11, *Physiology of Aging*, ed. Masoro, E. (Oxford Univ. Press, New York), pp. 555-590.

Weindruch R, Walford R.L. (1988) *The Retardation of Aging and Disease by Dietary Restriction* (Charles C. Thomas, Springfield, IL). •

AID TO TEXAS RESEARCHERS CONTINUED

mouse fertility expert John Eppig, Ph.D., in an effort to rescue his strain. *In vitro* fertilization attempts look promising. With luck, assisted breeding efforts will be successful and years of research will not be lost. •

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Diabetes & Obesity Models
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Web Sites
JAX® MICE
www.jax.org/jaxmice

JAX® Mice Searchable Database
www.jax.org/jaxmice/pricelist

Induced Mutant Resource
www.jax.org/resources/documents/imr

Mouse Genome Informatics
www.informatics.jax.org

The Mouse Phenome Project
www.jax.org/phenome

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