

# Animal Source

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Animal  
Resource  
Program

## Malocclusion in Mice

Malocclusion of the incisor teeth is a common disorder of many strains of laboratory mice that is diagnosed by examination of the mouth. Rodents are particularly susceptible to malocclusion since their incisor teeth continue to grow throughout life. Normally, the teeth of the mouse are aligned such that the upper and lower incisors are in contact. Correct tooth length is maintained as a result of constant wear from gnawing. If the teeth are misaligned the incisors do not wear evenly which lead to overgrowth and malocclusion.



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Eruption of the incisors occurs in young mice between days 10-12 of age. The incisors will normally remain a constant size in adult mice because the rate of eruption will equal the rate of wear. The entire tooth is worn down and replaced every 35-45 days.

Malocclusion in mice has been linked to trauma of developing teeth and genetic predisposition. Certain strains, especially those with a C57BL background, have an increased incidence of malocclusion. The Jackson

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*AAALAC site visit  
will be the week  
of July 28, 2003*

## Strain of the Season: C57BL

The C57BL inbred strain of mice originated in 1921 from a cross between two mice (female 57 + male 52). Today it is one of the most widely used inbred strains in biomedical research. The C57BL has also been used as the genetic background for a large number of congenic strains.

Many substrains have been developed from the C57BL strain, with the C57BL/6 being the most commonly referenced in journal citations. Characteristics pertaining primarily to the C57BL/6 will be described here.

The C57BL/6 has been reported to have a high incidence of congenital abnormalities, including eye defects such as microphthalmia and anophthalmia 8-20%, hydrocephalus 1-3%, polydactyly and otocephaly 10%.

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## Research Produces Conclusive Evidence Indicating Pain Perception in Fish

Researchers from the Roslin Institute and the University of Edinburgh have demonstrated the presence of nociception (the detection of noxious, tissue damaging stimuli) and adverse behavioral and physiological effects resulting from stimulation of these nociceptors in rainbow trout. This fulfills the criteria for pain perception and is the first time this has been demonstrated in fish. The results from these studies are to be published in the June 2003 issue of *Proceedings B*, a journal published by the Royal Society.

Using electrophysiological recordings, researchers determined the presence of nociceptors on the face and head of rainbow trout. These nociceptors responded to at least one of three types of noxious stimuli (mechanical, thermal or chemical). Several of the receptors responded to all three stimuli and can be defined as polymodal nociceptors. This is the first time polymodal nociceptors have been found in fish and they appear to have similar properties to those found in amphibians, birds and mammals.

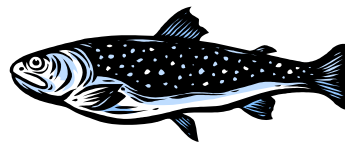
However, the presence of nociception in an animal is not enough to prove pain perception. To demonstrate pain perception it is necessary to show that an animal's behavior is adversely affected by a potentially painful experience and these behavioral changes are not simple reflex responses. In this study, bee venom or acetic acid was injected into the lips of trout. Venom or acid injected fish demonstrated 'rocking' motion similar to that seen in stressed higher vertebrates like mammals, and were observed to rub their lips on the gravel in their tank and on the tank walls. Control fish injected with saline or merely handled did not exhibit these behaviors. In addition, venom or acid injected fish took almost three times longer to resume feeding activity compared to controls.

For more information see

<http://www.royalsoc.ac.uk/templates/press/releasedetails.cfm?file=446.txt>

Reference:

Sneddon LU, Braithwaite VA and Gentle MJ. Do fish have nociceptors: evidence for the evolution of a vertebrate sensory system. *Proceedings of the Royal Society: Biological Sciences* 270 (1520), June 2003.



*Malocclusion in Mice, continued from page 1*

Laboratory has determined the malocclusion incidence rate (for the year 2002) of their C57BL/6J (stock # 000664) strain to be 0.0460% compared to a rate of 0.0018% for their BALB/cJ (stock # 000651) strain.

Malocclusion is often diagnosed at or around weaning in mice. Any mouse that is smaller and thinner than its littermates at weaning should be examined for this disorder. Young mice with malocclusion are generally euthanized. If malocclusion occurs later in life due to trauma, oral tumor formation or other causes it may be possible to provide palliative treatment to maintain a valuable animal. This would consist of regular tooth trimming using a blunt-tipped scissors and feeding a powdered diet. Trimming of the teeth is not painful (the pulp is not exposed in mice) but the stress of handling and intensive management may be detrimental to the animal.

Reference:

Malocclusion in the Laboratory Mouse. JAX Notes (The Jackson Laboratory): # 489, Spring 2003.

## Color Coding Prevents Injection Mix-Ups

By Barbara H. Bellanger, BS, RLAT, Syracuse Cancer Research Institute, Inc., Syracuse, NY

Within our rodent facility, a good share of our research effort involved injecting varied combinations and dosages of test compounds at different times and intervals each day for several days, all within a single experiment. Needless to say, this made for an extremely confusing situation, especially since all compounds were made fresh daily. It was very easy to make an error-with the potential of invalidating the entire experiment.

Brainstorm! Crayons and masking tape to the rescue!

A different color was designated for each compound, one for each dosage and, when necessary, one for each specified injection time. Crayons were chosen over markers because of the greater selection of colors. A strip of masking tape bearing the appropriate combination of colors (in addition to written protocol instructions) was placed on the rack above each corresponding cage, on the cage itself, and on each cage card. The appropriate combination of colors was also placed on the label of each injection vial. A master chart was made for use when making and mixing the compounds; it was also used at the injection table as a double-checking reference when performing the injections. As each cage of animals was moved from the rack to the injection table, the color sequences on the rack, cage, vial and master chart were compared-a very quick and easy step to ensure accuracy. A sheet of paper was also taped next to the master chart and each compound color was checked off as it was completed for each cage.

Masking tape stays attached to each surface and thus cannot become lost or mixed up, as cards have been known to do. This coding method also provides a quick reference that ensures cages do not get placed in the wrong space on the rack or the wrong compounds injected. This color-coding step takes a few extra minutes of initial preparation, but it has paid for itself many times over. Since this small but important addition to our protocol SOPs was devised, I am happy to report not a single mix-up has occurred in our laboratory.

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*Strain of the Season, continued from page 1*

Age-related hearing loss due to a single recessive gene that causes degeneration of the organ of Corti leads to severe sensorineural hearing loss by 14 months of age. Dermatitis with intense puritis leading to self mutilation and death (sometimes associated with fur mite infestation) is more severe in this strain than others. Behaviorally, the C57BL/6 shows a high alcohol preference, high open field exploration (low emotionality) and high locomotor activity.

Reproductive performance is considered good with large litter size (mean 6.2). Embryonic cell lines have been established for the C57BL/6. The life span is above average in both sexes with a median life span of 600 days.

Reference:

<http://www.informatics.jax.org/external/festing/mouse/docs/C57BL.shtml>



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*The Animal Resource Program (ARP) is committed to providing PSU faculty, staff and students with high quality, cost-effective research animal resources. In addition to suitable housing facilities and animal husbandry services for animals used in biomedical research, ARP provides veterinary and diagnostic services, personnel training and expertise in laboratory animal technology and medicine. ARP veterinarians are also available to participate in collaborative research projects with PSU investigators. Areas of interest include animal behavior and welfare, infectious disease, and pathology.*

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## **Proposed Amendment to AWA to Require Medical Records**

The USDA has submitted public notice of a proposed amendment to the Animal Welfare Act (AWA) regulations to require research facilities maintain medical records as part of their program of adequate veterinary care. Maintenance of medical records is currently implied through the AWA requirements for adequate veterinary care, but the regulations do not specifically stipulate the maintenance of medical records as one of the elements in a program of adequate veterinary care. The proposed amendment requires maintenance of legible medical records that would include information such as the vaccination history, surgical history and any known drug sensitivities of the animals. Research facilities would be required to keep medical records for 1 year after the disposition of the animals. Individuals and organizations may submit comments on the proposed amendment until June 10, 2003. Further information may be obtained at:

<http://www.aphis.usda.gov/ppd/rad/webrepor.html>

*The U.S. Animal Welfare Act currently excludes birds, rats of the genus *Rattus* and mice of the genus *Mus* bred for use in research and horses and other farm animals not used in biomedical research.*