

# Animal Source

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## PSU Animal Resource Program

### Parvoviruses of Mice

Parvoviruses are single-stranded DNA viruses that are commonly found in laboratory mouse colonies and are extremely resistant to environmental degradation. Mice Minute Virus (old name: Minute Virus of Mice) and Mouse Parvovirus (MPV) are antigenically distinct parvoviruses whose natural host is the mouse (*Mus musculus*). Both viruses are shed in the feces and urine and are transmitted by either direct contact or contact with virus contaminated fomites. In general, parvoviruses are species specific and are not transmitted to other than the natural host species.



Mice Minute Virus (MMV) infection in immunocompetent mice results in a short-lived infection with recovery. Experimental infection with MMV in immunodeficient mice results in a leukopenia due to suppression of hemopoietic progenitors (1). MPV infection in immunocompetent mice leads to a persistent infection of the lymphoid tissue, especially the mesenteric lymph nodes. These natural infections with MPV are subclinical but are reported to cause immunomodulation (2).

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### Strain of the Season: FVB/N

The FVB/N mouse strain was developed in the early 1970's from a group of mice found to carry the *FvI<sup>b</sup>* allele for sensitivity to the B strain of Friend leukemia virus (1). The FVB strain is commonly used in the production of transgenic mice to generate fertilized eggs for the microinjection of DNA. FVB mice breed and reproduce well, produce large litters and have fertilized eggs with large, easily viewed pronuclei that make DNA microinjection easier to accomplish.

FVB/N mice are albino (*c*) and carry the *Pdeb<sup>rdl</sup>* retinal degeneration mutation. This mutation is inherited as an autosomal recessive trait that affects retinal development. Rod photoreceptors in the

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*Visit the ARP  
website at  
[www.research.psu.  
edu/arp](http://www.research.psu.edu/arp)  
for answers to your  
animal use questions*

*The next AAALAC  
site visit to PSU will  
be in the summer of  
2003*

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Diagnosis of infection with either virus can be accomplished by serology or PCR based testing (3). PCR testing is also used to screen cultured cells or other biological materials from mice for the presence of either virus. There is no treatment for infection with these viruses. Prevention and control are accomplished through decontamination procedures using sterilization and parvoviracidal disinfectants. Infection in a colony may be eliminated by rederivation using embryo transfer or caesarian section to repopulate the colony with uninfected mice.

References:

1. Segovia JC, Gallego JM, Bueren JA, Almendral JM (1999) Severe leukopenia and dysregulated erythropoiesis in SCID mice persistently infected with the parvovirus minute virus of mice. *J Virol* 73(3) 1774-84.
2. McKisic MD, et al (1998) Mouse parvovirus infection potentiates allogeneic skin graft rejection and induces syngeneic graft rejection. *Transplantation* 65(11), 1436-46.
3. Livingston RS, et al (2002) Serodiagnosis of mice minute virus and mouse parvovirus infections in mice by enzyme-linked immunosorbent assay with baculovirus-expressed recombinant VP2 proteins. *Clin Diagn Lab Immunol* 9(5), 1025-31.

## Ag Vet Search Underway

The search to fill the position of PSU Attending Veterinarian for Agricultural Animals and Wildlife is underway. The Attending Veterinarian provides guidance and oversight for the care and use of agricultural animals and wildlife used to support teaching, research, and extension programs at PSU. Selected applicants will be interviewed in the next few months with the goal of finding a suitable candidate as soon as possible. The position was previously held by Dr. Robert Smith who left PSU to become the National Program Leader for Agricultural Homeland Security for the Cooperative State Research, Education and Extension Service within the USDA.

## Use of Perphenazine to Control Cannibalism in DBA/1 Mice

Carter D, Kennett MJ, Franklin CL (2002) *Comparative Medicine* 52 (5)

**Abstract:** Maternal administration of perphenazine decreased the incidence of cannibalism in colonies of interferon- $\gamma$ , interleukin (IL-4, IL-10, and IL-12) knockout mice of the DBA/1 and C57BL/6 background strains. This colony had high incidence of neonatal death due to cannibalism in approximately 50% of the pups. Perphenazine was administered to the dams in the drinking water, beginning on the day before or the morning of parturition. The medicated water was supplied at two dosages: 0.5 mg/ml and 0.025 mg/ml, resulting in a dosage of 4 mg/kg of body weight and 2 mg/kg, respectively, to the dams. Dams that were treated with perphenazine weaned 76.4% of their pups, compared with nontreated dams that weaned only 59.4% of their pups. Timing of the administration of perphenazine did not have a significant impact on efficacy; also, both doses were equally effective at preventing cannibalism. These findings indicate that perphenazine can modify poor maternal behavior such as cannibalism, resulting in more efficient production of valuable knockout mice.

**Editor's note:** Perphenazine is a phenothiazine tranquilizer/antipsychotic drug that acts on the central nervous system and is used to treat anxiety-related disorders in human patients.

*Strain of the Season, cont. from p.1*

retina of the eye begin to degenerate during the second postnatal week of life and disappear completely by 35 days, resulting in severe visual impairment (2).

Due to their visual impairment, FVB/N mice do not perform well in behavioral tasks, such as the Morris water maze, that require visual acuity for completion (3). FVB/N mice also perform poorly in another complex learning task, contextual fear conditioning, in which animals are trained to associate an electric shock paired with a tone, in a particular contextual environment (3). This strain has been characterized by Mineur (4) as having slightly higher levels of anxiety and aggression than the C57BL/6J strain (which is usually characterized as a low anxiety strain). Mineur (4) also found that FVB/N have learning deficits that they related to a small intra- and infrapyramidal mossy fiber projection.

Mahler (5) found that compared with other mouse strains, the FVB/N had a higher rate of lung alveolar-bronchiolar tumors and a lower incidence of liver tumors and lymphomas. In the same study, there was a 60% survival rate (for both sexes) to 24 months with a 55% and 66% gross tumor incidence in males and females, respectively, at that age.

#### References:

1. <http://www.informatics.jax.org/external/festing/mouse/docs/FVB.shtml> Accessed on 1/23/03.
2. Gimenez, E and Montoliu, L (2001) A simple polymerase chain reaction assay for genotyping the retinal degeneration mutation (Pdeb<sup>rd1</sup>) in FVB/N-derived transgenic mice. *Laboratory Animals* **35**, 153-156.
3. Crawley, JN, et al (1997) Behavioral phenotypes of inbred mouse strains: implications and recommendations for molecular studies. *Psychopharmacology* **132**, 107-124.
4. Mineur, YS and Crusio, WE (2002) Behavioral and neuroanatomical characterization of FVB/N inbred mice. *Brain Res Bull* **57** (1), 41-47.
5. Mahler JF, Stokes W, Mann PC, Takaoka M and Maronpot RR (1996) Spontaneous lesions in aging FVB/N mice. *Toxicol Pathol* **24**(6), 710-716.



## Controlled Drugs in the Laboratory

Some of the drugs commonly used in animal-based research may potentially be abused by humans and as such, are regulated by the U.S. Drug Enforcement Administration (DEA). Regulated drugs are referred to as “controlled drugs” and are assigned to one of five possible categories. The categories are referred to as “schedules” and range from I (most addictive or subject to abuse) to V (least addictive or subject to abuse). Ketamine, pentobarbital and buprenorphine are examples of controlled drugs that are frequently used in research.

Researchers who want to use controlled drugs must register with the DEA and pay a fee before they may purchase the drugs. Registrants must keep records of the amount of drug purchased and its subsequent dispersal. The drugs themselves must be kept under double locks when not in use. Applications for drug registration may be obtained from <http://www.deadiversion.usdoj.gov/drugreg/index.html>.

Assistance may also be obtained by calling the DEA registration call center’s toll free number (1-800-882-9539) 24 hours a day. Researchers must renew their DEA registration annually and contact the DEA if their business address changes during that time period.

## Animal Resource Program

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The next  
Mouse Biomethodology Seminar  
will be held February 21, 2003  
from 9 am to 12 pm.  
Contact the ARP office to  
register.

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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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## Rodent Surgery Workshop Coming April 11

ARP will be offering a 3 hour workshop from 1-4 pm on April 11, 2003 to provide research personnel with the opportunity to learn and apply basic surgical concepts and techniques used in rodent surgery. This will include practice in handling surgical instruments, surgical knot tying and suture patterns initially using inanimate models. Participants will then perform two surgical procedures on an anesthetized mouse using aseptic technique.

To make this session as informative and productive as possible, the student to instructor ratio will be low (2-3:1) and participants will be expected to view instructional material on compact disc (provided by ARP) prior to attending the workshop. Prior surgical experience is not required and instructors will demonstrate procedures before participants attempt to complete them.

Attendance is limited and registration at least one week before the date of the workshop is required to allow ample time for participants to view the prerequisite CD. Please call the ARP office (865-1495) for more information and to register to attend.

