# Laboratory Animal Facilities

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## General Summary

The purpose of the Laboratory Animal Facilities (LAF) is to support *in-vivo* research and to contribute to the development of basic and clinical medicine. In 2011, 167 researchers used the LAF. We undertake breeding of experimental animals and technically guide researchers in animal experimentation. In addition, we performed the following studies to develop basic medical sciences, including laboratory animal science.

## Research Activities

*Development of a novel method of fecal occult blood testing in dogs and the effects of gastrointestinal parasitic infections on fecal occult blood levels in dogs*

The fecal occult blood test (FOBT) is a method for detecting a small amount of blood in feces which is undetectable with the naked eye or under a microscope. In medical science, the FOBT was developed as a screening test for alimentary canal tumors and inflammatory diseases. A chemical FOBT was based on the peroxidase activity of hemoglobin. Thus, this chemical test had low sensitivity and specificity, because it often obtained false-positive and a false-negative results if patients' diets contained hemoglobin of other species, myoglobin, and vitamin C. Therefore, a test subject must be placed on a restrictive diet before a chemical FOBT. For this reason, the FOBT is not widely used in veterinary practice. In particular, performing the FOBT for dogs and cats, which are the most common animals brought to small-animal clinics, is difficult because of their feeding habits and their various breeding environments.

We developed a novel FOBT for dogs, investigated its performance, and studied its indications. We demonstrated that our FOBT method is independent of a dog's diet, which might include the meat or blood of animals of other species or oranges, which contain vitamin C. In addition, we found that infection with a certain type of gastrointestinal parasite causes significant increase of FOBT values in dogs. This increase was significantly decreased with anthelmintic treatment. This result suggests that our FOBT method is useful for screening for parasitic infections in human and animals in developing countries where these zoonotic parasitoses are common.

We are now collecting cases of gastrointestinal cancer in dogs. In addition, we are analyzing changes over time after experimental infection of *Echinococcus multilocularis* in dogs.

*Establishment and characterization of strains derived from Japanese wild mice and Phodopus hamster*

Our inbred strains derived from Japanese wild mice (*Mus musculus molossinus*) and *Phodopus* hamsters were maintained in this laboratory.

Japanese wild mice are classified as *M.m.molossinus* and originated from a natural inter-subspecific hybrid between *Mus musculus castaneus* inhabiting southwest Asia and *Mus musculus musculus* distributed in north Asia. The *M.m.molossinus* subspecies is an excellent source for improving laboratory mice, because it was suspected to be greatly different in gene constitution from common laboratory mice derived from the *Mus musculus domesticus* subspecies. We have established several new inbred strains based on *M.m.molossinus* mice captured in Osaka Prefecture. These strains are being maintained in our laboratory, and new consomic strains based on these strains are being developed.

In collaboration with the Department of Molecular Biology, we developed 2 new mouse strains using our original *M.m.molossinus* inbred strain named MSKR. One is the congenic strain having knockout allele of Oaz1 derived from the B6.129-*Oaz1*$^{tm}$ to the MSKR background, and the other is a consomic strain that has chromosome 10 derived from the above-mentioned strain to the MSKR background. We have confirmed that these newly established strains are useful for researching genetic modifications in Oaz1 knockout mice.

The *Phodopus* hamster is a small rodent that differs taxonomically from the Syrian hamster, which is the major laboratory hamster. We recently determined that this hamster is a good candidate for a new laboratory animal and have established an inbred strain named PMI.

A PMI hamster with a morphologically abnormal stomach was found on anatomical screening in May 2010. Pathological observation suggested this abnormality represented a well-differentiated adenocarcinoma. By successive anatomical screening of 41 PMI hamsters, we confirmed the occurrence of morphologically abnormal stomachs in 39 of 41 hamsters (95.12%) at a mean age of 309 days (range, 196 to 515 days). On the other hand, all 12 hamsters of the inbred TAK strain, which was established from *Phodopus campbelli* in 2009, showed normal stomachs at a mean age of 256 days (range, 236 to 293 days). The high incidence of morphologically abnormal stomachs was thought to be a special feature of the PMI inbred strain.

*The search using the NC/Nga inbred strain for a novel drug for treating atopic dermatitis*

The NC/Nga inbred strain is the current mouse model for atopic dermatitis. However, the onset rates of dermatitis differ among separate lines in each laboratory. The NC/Nga inbred strain maintained in our laboratory has an extremely severe dermatitis diathesis.

In collaboration with the Department of Tropical Medicine, we are using the NC/Nga mice to research new drugs for treating atopic dermatitis.

## Publications

***Wada A, Kanai T[1], Ohkawa K, Tsudzuki M[2] ([1]Tokyo Women's Med Univ, [2]Hiroshima Univ).*** Stomachic carcinogenesis in the inbred hamster originated from Phodopus campbelli. *Exp Anim.* 2011; **60:** 262.

***Kanai T[1], Wada A, Ohkawa K, Tsudzuki M[2] ([1]Tokyo Women's Med Univ, [2]Hiroshima Univ).*** A case of Gastric carcinoma of the inbred Hamster from originated Phodopus campbelli. *Exp Anim.* 2011; **60:** 312.