

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 2008, 173 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

*Establishment and characterization of the strains derived from the Japanese wild mouse (*Mus musculus molossinus*) and the *Phodopus* hamster*

Inbred strains derived by us from the Japanese wild mouse (*M. m. molossinus*) and the *Phodopus* hamster were maintained in the LAF. The Japanese wild mouse originated from a natural intersubspecific hybrid between *Mus musculus castaneus* inhabiting southwest Asia and *Mus musculus musculus* distributed in north Asia. The *molossinus* subspecies is an excellent means for improving laboratory mice, because this subspecies was suspected to be greatly different in genetic constitution from common laboratory mice derived from the *domesticus* subspecies. We have established several new inbred strains based on *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 *molossinus* inbred strain, MSKR. One is a congenic strain having a 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 research into the genetic modification of *Oaz1* knockout mice. *Phodopus* hamsters are small rodents differing taxonomically from Syrian hamsters, which are the major laboratory hamster. We have recently determined that this hamster is a good candidate for a new laboratory animal and have established an inbred strain. Furthermore, we continue to establish other inbred strains and congenic strains, to develop human disease models, and to study their biomedical characteristics.

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

The NC/Nga inbred strain is the current mouse model for atopic dermatitis. However, the rates of dermatitis differ among separate lines at each laboratory. The NC/Nga inbred strain maintained in our laboratory is a line with a particularly severe dermatitis

diathesis. In collaboration with the Department of Tropical Medicine, we are searching for a novel atopic dermatitis therapeutic drug through the use of NC/Nga mice.

Ovulation inhibition due to removal of peripheral blood phagocytes

Reactive oxygen species (ROS) containing superoxide are believed to be involved in ovulation. By using a specific superoxide sensor we have recently confirmed the production of superoxide and showed the immunohistochemical localization of DNA and lipid peroxides in the ovulating ovary. Phagocytes, such as neutrophils and macrophages, are thought to be the sources of ROS involved in ovulation. This year, we started to examine whether the removal of peripheral blood phagocytes inhibits ovulation, to examine the source of ROS involved in ovulation.

Induction of follicular regression by photodynamic therapy

Polycystic ovary is a severe ovarian factor in infertility. Accumulation of follicles without ovulation is peculiarity of polycystic ovary. On the other hand, photodynamic therapy is a physiotherapy that causes cell death through a photosensitizer excited by laser light of a specific wavelength. Photodynamic therapy is used to treat several kinds of cancer. We have found that the photosensitizer accumulates in ovarian follicles. Using this characteristic of the photosensitizer, we examined the induction of follicular regression by photodynamic therapy.

Publications

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