Laboratory Animal Facilities

Kiyoshi Ohkawa, *Professor and Director* Koichi Nariai, *Assistant Professor*

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 2009, 176 researchers used the LAF. We undertake breeding of experimental animals and guide researchers in the techniques of animal experimentation. In addition, we performed the following studies to develop basic medical sciences, including laboratory animal science.

Research Activities

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 the ROS involved in ovulation. We examined whether the removal of peripheral blood phagocytes inhibits ovulation, to examine the source of the ROS involved in ovulation.

Induction of follicular regression by photodynamic therapy
Polycysic ovary is an important ovarian factor in infertility. Accumulation of follicles without ovulation is a characteristic of polycystic ovary. On the other hand, photodynamic therapy is a type of 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 with photodynamic therapy.

Establishment and characterization of the strains originated from Japanese wild mice (Mus musculus molossinus) and Phodopus hamster
Inbred strains that we 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 intersubspecific hybrid between *Mus musculus castaneus* inhabiting southwest Asia and *Mus musculus musculus* distributed in north Asia. The *M. m. molossinus* subspecies is an excellent material to improve laboratory mice, because its gene constitution is suspected to differ greatly from that of the 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 a *M. m. molossinus* inbred strain we developed and named 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 that differ taxonomically from Syrian hamsters, which are the most commonly used laboratory hamsters. We recently determined that the *Phodopus* 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 research its biomedical characteristics.

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

The NC/Nga inbred strain is the current mouse model for atopic dermatitis. However, the onset rates of dermatitis differ among lines maintained at different laboratories. 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 using NC/Nga mice to search for new drugs for treating atopic dermatitis.

Publications

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