# 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 2013, about 450 researchers were registered as users of the LAF. We undertake breeding of experimental animals and provide technical guidance to researchers in animal experimentation. In addition, we performed the following studies to develop basic medical sciences, including laboratory animal science.

## Research Activities

*Studies of parasite-vector and parasite-host interactions of African trypanosomes*
African trypanosomiasis is a deadly protozoan disease of humans and animals. The disease is caused by African trypanosomes, which are transmitted by tsetse flies (*Glossina* spp.). To adjust to the mammalian host and insect vector environments, the parasite has a complicated lifecycle involving developmental stages. The lifecycle stage developments of *Trypanosoma congolense*, the cause of African animal trypanosomiasis, are reproducible *in vitro*. Taking advantage of this *in vitro* culture system, we are seeking targets to develop novel methods of controlling this disease. We are now studying molecular mechanisms underlying adhesion of parasite cells to host or tsetse tissues and lifecycle stage developments that are essential biological processes for the parasite to be transmitted.

*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*
With advances in veterinary medicine, the lives of companion animals, such as dogs and cats, have been extended. On the other hand, neoplastic diseases have also been increasing, and the development of screening methods has become an urgent task. 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. The FOBT was originally developed as a screening test for alimentary canal tumors in human patients. However, the FOBT remains rarely used in veterinary medicine. In addition, little is known about its clinical significance, because the chemical FOBT is based on the peroxidase activity of hemoglobin. Thus, this chemical test has low sensitivity and specificity, because it often obtained false-positive or false-negative results if patients' diets contain hemoglobin of other species, myoglobin, or ascorbic acid (vitamin C). Therefore, a test subject must be placed on a restricted diet before a chemical FOBT. 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 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 a significant increase of FOBT values in dogs. This increase was significantly decreased with antihelminthic 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 analyzing cases of gastrointestinal cancer in dogs.

## Publications

***Alam MZ, Nakao R, Sakurai T, Kato H, Qu JQ, Chai JJ, Chang KP, Schönian G, Katakura K.*** Genetic diversity of Leishmania donovani/infantum complex in China through microsatellite analysis. *Infect Genet Evol.* 2014; **22:** 112–9.