Resource animals provide a variety of useful biological functions and products for human life, and thus large numbers of these animal species are indispensable for human being. We are performing the diversified researches on animal breeding and genetics, which extend from a basic study toward the elucidation of many genetic mechanisms to an applied study toward the establishment of animal breeding strategy for genetic improvement, by utilizing both statistical and molecular genetic approaches. Further, we are carrying out a variety of researches on conservation of endangered animal species, relationship between global warming and microevolution in wild species, and so on.

**Elucidation of Genetic Mechanism**

We are performing a research on elucidation of molecular mechanisms and gene network for useful traits, through exploration, identification, and functional analysis of genes involved in the traits. Whole genomic sequencing is now ongoing in resource animals. QTL analysis methodology is making remarkable progress, making genetic dissection an interesting task for the future.

**Promotion of Animal Breeding in Livestock**

Wagyu has been improved by many years of endeavor in Japan, and is established as a unique livestock, resource animal that has a genetic capability to produce high-quality protein. We are performing a research on prediction of the genetic capability for useful traits in various resource animals including Wagyu, and on development of animal breeding strategy for genetic improvement.

**Evaluation of Genetic Diversity in Ibis**

Captive propagation and tentative release of the endangered crested ibis, *Nipponia Nippon*, are now in progress as national project. The information on genetic diversity of captive population in this species is very important for promotion of the project. We are studying development of DNA markers and individual classification utilizing MHC genes in this species.

**Analysis of Global Warming & Microevolution**

Evolution theory concerning natural selection plays a pivotal role in contemporary doctrine for adaptive evolution. We are analyzing an effect of global warming on change of gene constitution in animal species, and microevolution due to natural selection.
Keywords

Quantitative genetics, Statistical genetics, Molecular genetics, Population genetics, Conservation genetics, DNA analysis, Bayesian analysis, Gene network system, Genetic diversity, Endangered animals, Wagyu, Animal Breeding

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