

Animal genetics research in East and Southeast Asia

Overview

The Chinese Academy of Agricultural Sciences (CAAS) and ILRI established the ILRI–CAAS Joint Laboratory on Livestock and Forage Genetic Resources (JLLFGR) in Beijing, China in 2004 as a platform to implement joint research projects of common interests in the area of livestock and forage genetic diversity, as well as share technical expertise, conduct joint national or international training courses, workshops and conferences, and provide research facilities and technical assistance to relevant ILRI projects in Asia.

This animal genetics joint lab focuses its research on: molecular characterization of local poultry, pigs, cattle and small ruminants; new genomic resources for breeds tolerant/resistant to diseases and/or adaptable to climate change; cryopreservation of animal genetic resources; and conservation of indigenous breeds.

In 2015, another ILRI–CAAS joint lab was established. Focusing on animal diseases, the Joint Laboratory for Ruminant Disease Control (JLRDC) is based in Lanzhou, China. This animal disease joint lab specializes in research on control of infectious diseases of ruminants through advanced research on genomics, vaccines and diagnostic tests.



Research

Animal genetics joint lab

- Molecular characterization and conservation of genetic resources of local poultry, pigs, cattle and small ruminants
- New genomic resources to unlock the genetic basis of disease resistance/tolerance and agro-climatic adaptation of animal and forage genetic resources
- Support on germplasm innovation and the unlocking of key functional genes of unique animal and forage genetic resources, cryopreservation of animal genetic resources, and the modernization of lamb and beef production
- Currently the joint lab provides facilitation and technical support to five relevant Natural Foundation of Science of China-funded projects, focusing on: genomics analyses, local adaptation and disease resistance/tolerance of Asian and African domestic pigs and wild boars, domestic and wild sheep, and domestic and wild buffaloes, as well as rumen microbiology and metagenomics of cattle, yak and sheep.

Animal diseases joint lab

- Development of vaccinology approaches, such as next-generation sequencing and proteomics, to characterize pathogens at molecular level, with the aim of developing new vaccines and diagnostic tests
- Definition of the functional genes of ruminants that contribute to disease resistance/tolerance and arthropod vectors of disease.

Opportunities for joint research

- Genomics for pathogen (virus and parasite) discovery and vaccine development for poultry with Harbin and Shanghai Veterinary Research Institutes
- Testing and improving existing and novel recombinant vaccines (contagious bovine pleuropneumonia) with private companies (PGI-I and -II vaccine)
- Regional foot-and-mouth disease and African swine fever projects
- Feed technology (e.g. rumen genomics) and improved crop residue utilization with IAS- and IF-CAAS
- Intensifying mixed crop-tree-livestock systems in the humid tropics area in southwest China
- Diversifying pastoral production systems for economic sustainability and environmental health in drylands and highlands in northwest China.

Capacity development

- More than 50 masters and PhD students and visiting scientists from CAAS and several Chinese universities were trained
- Around 50 visiting scientists, masters and PhD students from Papua New Guinea, Indonesia, Iran, Vietnam, Pakistan, Sri Lanka, Nepal, Mongolia and Bangladesh were trained from two weeks–three years
- Approximately 40 collaborators and scientists from Italy, Germany, Hungary, Japan, Brazil, Australia, UK from institutions including International Atomic Energy Agency, ILRI and International Centre of Insect Physiology and Ecology have visited the laboratory.

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