World Organisation for Animal Health

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# WOAH Collaborative Centre Reports Activities 2025

**This report has been submitted: 7 janvier 2026 07:29**

## CENTRE INFORMATION

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|---|---|
| ***Title of WOAH Collaborating Centre** | Food-Borne Parasites from the Asia-Pacific Region |
| ***Address of WOAH Collaborating Centre** | Key Laboratory for Zoonoses |
| ***Tel:** | +86-431 87.83.67.01 |
| ***E-mail address:** | liumy@jlu.edu.cn |
| **Website:** | https://ghb.jlu.edu.cn/WOAH1.htm |
| ***Name Director of Institute (Responsible Official):** | Liu Mingyuan, Institute of Zoonosis, Jilin University 5333 Xian Road 130062 Changchun China |
| ***Name (including Title and Position) of Head of the Collaborating Centre (WOAH Contact Point):** | Liu Mingyuan,Ph.D Director of Institute of Zoonosis,Jilin University |
| ***Name of the writer:** | Mingyuan Liu |

## TOR 1 AND 2: SERVICES PROVIDED

1. Activities as a centre of research, expertise, standardisation and dissemination of techniques within the remit of the mandate given by WOAH

| Category | Title of activity | Scope |
|---|---|---|
| Disease control (true) | Vaccine, diagnostic reagent, and novel drug research and development | Research and development of vaccines for trichinosis in pigs and Echinococcus granulosus infection in dogs; Development of diagnostic reagents for Clonorchis sinensis infection and hydatid disease; Research and development of novel anti-trichinella drugs. |
| Epidemiology, surveillance, risk assessment, (true) | Epidemiological Survey of Hydatid Disease | Epidemiological Survey of Hydatid Disease in the Changbai Mountain Region and Xiao Xing'anling Region of Northeast China |
| Training, capacity building (true) | Epidemiological Investigation Sample Preprocessing Training for Hydatid Disease | Collect samples of pasture grass, vegetables, and fruits from high-incidence areas of hydatid disease in China (such as Xinjiang and Qinghai), and conduct operational training on sample pretreatment using the water-washing sedimentation method. |
| Diagnosis, biotechnology and laboratory (true) | Research and Development of Novel Diagnostic Reagents | Development of Novel Nucleic Acid Diagnostic Methods for Clonorchis sinensis Infection and Hydatid Disease |
| Veterinary medicinal products (true) | Development of Novel Antitrichinella Drugs | Screen and validate novel drugs capable of blocking key molecules in the metabolic processes of Trichinella spiralis. |
| Vaccines (true) | Development of Novel Genetically Engineered Vaccines | Screening of Strongly Immunogenic Antigens for Trichinella spiralis, Echinococcus granulosus, Taenia saginata, and Taenia asiatica and Vaccine Development. |
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|---|---|---|
| Food security (true) | Monitoring of pork samples | Over 2,000 pork samples from provinces including Jiangsu, Guangxi, Sichuan, Inner Mongolia, and Hebei underwent testing for trichinosis and toxoplasmosis to ensure pork food safety. |

# TOR 3: HARMONISATION OF STANDARDS

2. Proposal or development of any procedure that will facilitate harmonisation of international regulations applicable to the main fucus area for which you were designated

| Proposal title | Scope/Content | Applicable Area |
|---|---|---|
| Diagnostic techniques for fasciolosis | Fasciolosis | Laboratory Expertise<br>Training and Education |
| Diagnostic techniques for orientobilharziasis | Orientobilharziasis | Laboratory Expertise<br>Training and Education |
| Diagnostic techniques for clonorchiasis | clonorchiasis | Laboratory Expertise<br>Training and Education |

3. In exercising your activities, have you identified any regulatory research needs* relevant for WOAH?

Yes

## Research need 1

**Please type the Research need:** Establishment of Trichinella testing standards for other food animals (excluding pigs and wild boars)

**Relevance for WOAH** Capacity Building, Standard Setting, Facilitation of international collaboration,

**Relevance for the Code or Manual**

**Field** Epidemiology and Surveillance, Diagnostics, Vaccines,

**Animal Category** Terrestrial,

**Disease:**

**Kind of disease (Zoonosis, Transboundary diseases)** Zoonosis,

**Additional keywords if needed: One keyword per entry**

"risk-based" ,quarantine system standards

**If any, please specify relevance for Codes or Manual, chapter and title**

(e.g. Terrestrial Manual Chapter 2.3.5 - Minimum requirements for aseptic production in vaccine manufacture)

*Answer:*

**Notes:**

*Answer:*

4. Did your Collaborating Centre maintain a network with other WOAH Collaborating Centres (CC), Reference Laboratories (RL), or organisations designated for the same specialty, to coordinate scientific and technical studies?

Yes

| Name of WOAH CC/RL/other organisation(s) | Location | Region of networking Centre | Purpose |
|---|---|---|---|
| WOAH CC for Food-borne Parasites in European | France | Europa | Collaboration in Managing Foodborne Zoonotic Parasites |
| WOAH CC for Food-borne Parasites in North America | Canada | América | Collaboration in parasite epidemiology |

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## TOR 4 AND 5: NETWORKING AND COLLABORATION

5. Did your Collaborating Centre maintain a network with other WOAH Collaborating Centres, Reference laboratories, or organisations in other disciplines, to coordinate scientific and technical studies?

Yes

| Name of WOAH CC/RL/other organisation(s) | Location | Region of networking Centre | Purpose |
|---|---|---|---|
| Agrichina Pharmaceutical Co., Ltd | China | Asia and Pacific | Collaborate to jointly develop group standards for diagnostic techniques of Clonorchis sinensis and advance vaccine research and development. |

## TOR 6: EXPERT CONSULTANTS

6. Did your Collaborating Centre place expert consultants at the disposal of WOAH?

Yes

| Name of expert | Kind of consultancy | Subject |
|---|---|---|
| Liu Mingyuan | Parasitosis morphology, diagnosis, serological diagnosis, molecular typing diagnosis and surveillance of epidemiology. | Nematodes,trematode,cestodes and protozoa |
| Wang Xuelin | Parasitosis morphology, diagnosis, serology diagnosis and molecular typing diagnosis. | Nematodes,trematodes,cestodes and protozoa |
| Zhu Guan | Parasitosis morphology, diagnosis, serology diagnosis and molecular typing diagnosis. | Nematodes,trematodes,cestodes and protozoa |
| Li Jianhua | Parasitosis morphology, diagnosis, serology diagnosis and molecular typing diagnosis. | Nematodes,trematodes,cestodes and protozoa |
| Yin Jigang | Parasitosis morphology, diagnosis, serology diagnosis and molecular typing diagnosis. | Nematodes,trematodes,cestodes and protozoa |
| Bai Xue | Parasitosis morphology, diagnosis, serology diagnosis and molecular typing diagnosis. | Nematodes,trematodes |
| TangBin | Parasitosis morphology, diagnosis, serology diagnosis and molecular typing diagnosis. | Nematodes,trematodes |
| Pascal Boireau | Parasitosis morphology, diagnosis, serology diagnosis and molecular typing diagnosis. | Nematodes,trematodes,cestodes and protozoa |
| Liu Xiaolei | Parasitosis morphology, diagnosis, serology diagnosis and molecular typing diagnosis. | Nematodes,trematodes,cestodes and protozoa |

## TOR 7: SCIENTIFIC AND TECHNICAL TRAINING

7. Did your Collaborating Centre provide advice/services to requests from Members in your main focus area?

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Yes

*Professor Liu Mingyuan, Professor Liu Xiaolei, Associate Professor Tang Bin, and Associate Professor Ding Jing from the Center traveled to Urumqi, Xinjiang, conducting fieldwork across multiple regions of Xinjiang. They systematically collected parasite samples, including Taenia saginata, Echinococcus granulosus, Echinococcus multilocularis, and Trichinella spiralis, while conducting on-site investigations into the prevalence of parasitic diseases in counties surrounding Urumqi and selected counties in the Kashgar region. Based on the survey findings, the team provided professional prevention and control recommendations along with technical guidance to local authorities.*

8. Did your Collaborating Centre provide scientific and technical training, within the remit of the mandate given by WOAH, to personnel from WOAH Members?

No

# TOR 8: SCIENTIFIC MEETINGS

9. Did your Collaborating Centre organise or participate in the organisation of scientific meetings related to your main focus area on behalf of WOAH?

Yes

| National/International | Title of event | Co-organiser | Date | Location | No. Participants |
|---|---|---|---|---|---|
| Nationally | 2025 Progress Meeting for the National Key R&D Program Project "Development of Novel Vaccines for Major Animal Parasitic Diseases" | Ministry of Agriculture and Rural Affairs Science and Technology Development Center | 2025-09-06 | Urumqi City, Xinjiang Uygur Autonomous Region | 50 |

# TOR 9: DATA AND INFORMATION DISSEMINATION

10. Publication and dissemination of any information within the remit of the mandate given by WOAH that may be useful to Members of WOAH

a) Articles published in peer-reviewed journals:

24

*1.Lee SO, Lee H, Chu KB, Li J, Hong SJ, Kim SS, No JH, Quan FS. Ivermectin Identified Using a High-Throughput Screening System Exhibits Anti-Clonorchis sinensis Activity in Rats. Antibiotics (Basel). 2025 Aug 19;14(8):837.*

*2.Zhang S, Zhao Y, Liang W, Wang S, Cui X, Zhu H, Zhang Y, Liu X, Li H, Mu W, Guo A. Rapid visual detection of Moniezia spp. in sheep feces via Recombinase Polymerase Amplification-Lateral Flow Dipstick (RPA-LFD) assay. Vet Parasitol. 2025*

*3.Zhang S, Jiang N, Dang Q, Chen G, Wang S, Wu X, Bai H, Sun L, Wang X. Functionalized Trichinella spiralis anti-tumor protein with polydopamine for hepatocellular carcinoma phototherapy and immunotherapy. Bioorg Chem. 2025*

*4.Wang H, Yang H, Li C, Chen M, Wang X, Zhang X, Gong P, Zhang N, Zhang X, Li J, Li X. β-Giardin as an Immunomagnetic Enrichment Target for Multi-Host Detection of Giardia duodenalis Cysts. Pathogens. 2025 Sep 11;14(9):918*

*5.Yu Y, Liu Y, Xu N, Li L, Yang Y, Liu X, Zhao L, Bai X. A CRISPR/Cas12a mediated click immunoassay catalyzed by in situ formation of clickase for highly sensitive detection of Trichinella spiralis. Biosens Bioelectron. 2025 Sep 1;283:117521*

*6.Yang H, Wang X, Zhang X, Yu Y, Li C, Wang H, Fan X, Gong P, Zhang N, Li X, Li J. First Characterization and Zoonotic Potential Evaluation of Giardia duodenalis in Ferrets in China. Transbound Emerg Dis. 2025 May 29;2025:3087035.*

*7.Wang C, Yin J, Shi Z, Xu Y, Chen J, Yan Y, Zhu G, Zhao J. 18S/28S rDNA metabarcoding identifies Cryptosporidium parvum and Blastocystis ST1 as the predominant intestinal protozoa in hospital patients from Changchun, Northeast China. Parasit Vectors. 2025 Sep 24;18(1):376.*

*8. Ma, Xiaoxiao; Ding, Jing; Song, Junpeng; Tang, Bin; Fang, Yiming; Wang, Ran; Liu, Mingyuan; Liu, Xiaolei; Li, Chen.CRISPR-RPA biosensor with digital glucometer-based diagnostics of zoonotic fish-borne clonorchiasis.FOOD CONTROL.*

*9.Li M, Yin J, Wang D, Zou B, Zhu G. Targeting translation initiation yields fast-killing therapeutics against the zoonotic parasite Cryptosporidium parvum. PLoS Pathog. 2025 Jul 28;21(7):e1012881 10.Shi W, Liu Y, Liu Y, Bai X, Liang Y, Yang Y, Wu F, Liu M, Xu N. The unique activity of the bone morphogenetic protein TGH4 affects the embryonic development of Trichinella spiralis and the establishment of vaccine protection. Vet Res. 2025 Feb 7;56(1):31*

*11.Zhang H, Wang X, Zhang X, Ma Y, Bao P, Yu Y, Wang Y, Gong P, Zhang N, Lee SO, Li X, Li J. Hepatic ferroptosis induced by Clonorchis sinensis exacerbates liver fibrosis. PLoS Negl Trop Dis. 2025 Jun 2;19(6):e0013164*

*12.Xu N, Wang Y, Xu N, Xiang Z, Wang D, Yu Y, Liu M, Liu X, Tang B, Bai X. Heterologous prime-boost immunization based on a human adenovirus 5 vectored containing Trichinella spiralis Cystatin-like protein elicits protective mucosal immunity in mice. PLoS Negl Trop Dis. 2025 Jul 16;19(7):e0013323*

*13.Qiu Y, Bai X, Gao J, Tang B, Liu M, Ding J, Liu X. GalNAc-siRNA conjugates mediate the silencing of the parasite-derived lncRNA: A novel therapeutic approach for liver fluke-induced liver fibrosis. Int J Biol Macromol. 2025 Aug;319(Pt 2):145580.*

*14.Lv Q, Si G, Li C, Jiang N, He Y, Dong Z, Mao H, Liu M, Liu X, Zhao Y, Ding J. Molecular characterization of zinc metalloproteinase Nas-14 from Trichinella spiralis and its participation in intestinal invasion. PLoS Negl Trop Dis. 2025 Aug 21;19(8):e0013437.*

*15.Zhai Z, Jiang P, Wang D, Chen T, Yin J, Zhu G. Type A asparagine synthetase in the zoonotic Cryptosporidium parvum (CpAsnA): Biochemical features and potential as a novel therapeutic target. Int J Parasitol Drugs Drug Resist. 2025 Aug;28:100601*

*16.Jin X, Liu X, Liu M. Modelling drug resistance dynamics for long-term schistosomiasis management. Lancet Microbe. 2025 Nov;6(11):101177.*

*17.in X, Liu M, Liu X. Emodepside for strongyloidiasis: insights from parasite genetics. Lancet Infect Dis. 2025 Oct;25(10):e544*

*18.Shi W, Liu Y, Bai X, Liang Y, Zhang S, Sun L, Lin W, Liu X, Xu N. Immunoregulation mediated by the enzyme inhibitory activity of helminth-derived serine protease inhibitor affects the protective efficiency of vaccines. Virulence. 2025 Dec;16(1):2569621.*

*19.Wang J, Cao Z, Jin X. Beyond bacteria: a multikingdom ecological perspective on neonatal gut and severe viral lower respiratory tract infection risk. Lancet Microbe. 2025 Dec;6(12):101202*

*20.Qin P, Tao Z, Shi K, Zhao J, Huang B, Liu H, Wang C, Yin J, Zhu G, Cacciò SM, Hu M. Molecular Epidemiology of Cryptosporidium spp., Giardia duodenalis, and Enterocytozoon bieneusi in Guizhou Angus Calves: Dominance of Angus Cattle-Adapted Genotypes and Zoonotic Potential of E. bieneusi. Microorganisms. 2025 Jul 25;13(8):1735.*

*21.Wang J, Zhao X, Jin X. Evaluating the Translational Potential of Gut-Restricted SERT Modulation. Gastroenterology. 2025 Sep;169(4):750-751*

*22.He P, Zhang D, Wang M, Duan R, Zhao Y, Wang S, Yang X, Liu X, Sun S. Functional identification of Annexin B1 and Annexin B2 from Cysticercus cellulosae and their mechanism in plasma membrane repair. PLoS Negl Trop Dis. 2025 Apr 17;19(4):e0013015.*

*23.Tao Z, Hong K, Qin P, Liu H, Wang C, Yin J, Li X, Zhu G, Hu M. Emergence of Cryptosporidium parvum IIc Subtype and Giardia duodenalis Assemblage E in AIDS Patients in Central China: Evidence for Neglected Transmission Dynamics. Microorganisms. 2025 Jul 24;13(8):1731.*

*24.Cai C, Gao S, Wang B, Zhao T, Gao H, Shi Y, Guo X, Xu Y, Sun Y, Guo D, Zhang J, Gao F, Liu Q, Fu Z, Zhu L, Liu X, Wang L, Zhao Y. Astragaloside IV as a potent vWbp inhibitor: An innovative strategy to mitigate foodborne Staphylococcus aureus infections. Biochem Pharmacol. 2025 Sep;239:117017.*

b) International conferences:
1
*1.Apicomplexa-2025 Virtual Symposium on Apicomplexan Parasites Research 2025.1.12 Professor Zhu Guan*

c) National conferences:
3
*1. The Fourth Young Scholars Symposium of the Veterinary Parasitology Branch, Chinese Society of Veterinary Science 2025.10.25-2025.10.28 Chengdu, Sichuan Province Professor Liu Xiaolei and Professor Ding Jing*
*2. The 18th Academic Exchange Conference of the Veterinary Food Hygiene Branch of the Chinese Society of Animal Science and Veterinary Medicine 2025.5.16-2025.5.19 Sichuan Province, Chongqing City Professor Bai Xue and Professor Li Chen.*
*3.The 23rd Academic Symposium of the Protozoology Branch of the Zoological Society of China 2025.8.8-2025.8.11 Zhengzhou City,Henan Province Professor Li Jianhua*

d) Other (Provide website address or link to appropriate information):
17
*Patents:*
*1. Echinococcus granulosus Antigen Eg142, Its Encoding Gene, and Applications ZL202510771558.8*
*2.A Hypothesized Protein Gene of the Fine-Grain Echinococcus Multilocularis and Applications of Its Encoded Protein ZL202510854490.X*
*3.Echinococcus granulosus Antigen Eg73, Its Encoding Gene, and Applications ZL202510771556.9*
*4.Primer sets, reagent sets, kits, and their application and methods for identifying Echinococcus granulosus G1 and Echinococcus multilocularis ZL202510248690.0*
*5.A Small-Molecule Antimicrobial Lead Compound Targeting Cryptosporidium Helicase ZL202411465057.9*
*6.Application of Rosmarinic Acid in the Preparation of Antimicrosporidian Drugs ZL202510346654.8*
*7.Application of GYY4137 in the Preparation of Antimicrosporidian Drugs ZL202510346699.5*
*8.A Trichinella Vaccine Kit Based on a Prime-Boost Sequential Immunization Protocol and Its Application ZL202411907957.4 9.Adenovirus Vector Carrying the Trichinella Spirochaeta CLP Gene, Its Construction Method, and Applications ZL202411907955.5*
*10.A Hybridoma Cell Line Secreting Monoclonal Antibodies Against Clonorchis sinensis and Its Applications ZL202510012108.0 11.Application of Cryptosporidium cgd8_1420 Protein as an Oocyst Wall Outer Membrane Marker Protein ZL202210804249.2 12.Application of Cryptosporidium cgd2_3320 Protein as an Oocyst Wall Outer Membrane Marker Protein ZL202210804003.5 13.Application of Protease-Related Activity Preparations in Modulating the Inflammatory Process of Respiratory Diseases ZL202411238603.5*
*14.Application of Protease-Related Activity Preparations in Treating Diseases Characterized by Hyperactive Inflammatory Immune Responses ZL202411238604.X*
*15.Application of Cryptosporidium cgd3_4260 Protein as an Oocyst Wall Outer Membrane Marker Protein ZL202210804005.4*
*16.A Trichinella Detection Kit Based on the CRISPR/Cas12a System and Click Chemistry, Its Method of Use, and Applications ZL 2024 1 1724315.0*
*17.A Method for Preparing Dual-Enzyme Inorganic Functional Nanobloms and Their Application in Competitive ELISA Kits for Detecting Clonorchis sinensis Infection ZL 2024 1 1933127.9*

11. What have you done in the past year to advance your area of focus, e.g. updated technology?
*Three batches of pilot-scale production for the genetically engineered subunit vaccine against bovine echinococcosis have been completed. The genetically engineered subunit vaccine against canine toxoplasmosis has entered the quality standards research phase. Significant breakthroughs have been achieved in the development of a chicken coccidiosis vaccine: large-scale production process optimization and quality standards formulation for the pentavalent live vaccine against chicken coccidiosis have been finalized, with five batches of intermediate trial products preliminarily completed. One new veterinary drug certificate clinical approval has been obtained, laying a solid foundation for the final product's market launch.*

12. Additional comments regarding your report: