World Organisation for Animal Health

Hong Liu - - CHINA_(PEOPLE'S_REP_OF)

WOAH Reference Laboratory Reports Activities 2025

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LABORATORY INFORMATION

***Name of disease (or topic) for which you are a designated WOAH Reference Laboratory:**	Spring viraemia of carp
***Address of laboratory:**	1011 of Fuqiang Road, Futianqu, Shenzhen, Guangdong Province, 518045, P. R. China
***Tel:**	+86-755 25 58 84 10
***E-mail address:**	709274714@qq.com
Website:	
***Name (including Title) of Head of Laboratory (Responsible Official):**	Tikang Lu/Director
***Name (including Title and Position) of WOAH Reference Expert:**	Hong Liu/professor
***Which of the following defines your laboratory? Check all that apply:**	Governmental

TOR1: DIAGNOSTIC METHODS

1. Did your laboratory perform diagnostic tests for the specified disease/topic for purposes such as disease diagnosis, screening of animals for export, surveillance, etc.? (Not for quality control, proficiency testing or staff training)

Yes

Diagnostic Test	Indicated in WOAH Manual (Yes/No)	Total number of test performed last year	
Indirect diagnostic tests		Nationally	Internationally
Cell culture (EPC, GCO, FHM)	Yes	57	0
Direct diagnostic tests		Nationally	Internationally
Conventional RT-PCR	Yes	78	0
Real-time RT-PCR	Yes	96	0
eDNA	No	65	0
microfllluidic and real-time RT-PCR	No	65	0

TOR2: REFERENCE MATERIAL

2. Did your laboratory produce or supply imported standard reference reagents officially recognised by WOAH?

No

3. Did your laboratory supply standard reference reagents (nonWOAH-approved) and/or other diagnostic reagents to WOAH Members?

Yes

Type of reagent available	Related diagnostic test	Produced/ provide	Amount supplied nationally (ml, mg)	Amount supplied internationally (ml, mg)	No. of recipient WOAH Member Countries	Country of recipients
cell line	virus isolation	EPC	75 Ml	0	1	CHINA (PEOPLE'S REP. OF),

4. Did your laboratory produce vaccines?

No

5. Did your laboratory supply vaccines to WOAH Members?

TOR3: NEW PROCEDURES

6. Did your laboratory develop new diagnostic methods for the designated pathogen or disease?

Yes

7. Did your laboratory validate diagnostic methods according to WOAH Standards for the designated pathogen or disease?

Yes

Name of the new test or diagnostic method developed	Description and References (Publication, website, etc.)
real-time RT-PCR	Peng Z, Jie S, Lishan L, Zhiheng Z, Rice A, Shishun G, Jiang W, Yumin Z, Lei Z, Hongwei L, Stone D and Hong L (2025) Development and partial validation of an RT-qPCR assay for the rapid detection of spring viremia of carp virus (SVCV). Front. Microbiol. 16:1726705. doi: 10.3389/fmicb.2025.1726705 (accepted)
eDNA concentration and validation in the early warinng, biosecurity system in the free hatchery establishment and in the closed koi farm	Results are analyzed and the paper is being drafted
Validation on microfluidic test on SVCV, KHV and CEV	National industrial standard has been drfted and is wating for being reviewed before publication
A highly sensitive electrochemical detection method for spring viremia of carp virus at ports based on signal amplification of gold nanoparticles	Patent No: ZL 2024 1 1425937.3
dot-based fluorescence immunoassay method	Kang W, Liao LS, Fang Y, et al., 2024. Establishment of a highly sensitive quantum dot-based fluorescence immunoassay method for on-site diagnosis of spring viremia of carp virus. Animal Husbandry & Veterinary Medicine, 56 (8): 91-96

8. Did your laboratory develop new vaccines for the designated pathogen or disease?

9. Did your laboratory validate vaccines according to WOAH Standards for the designated pathogen or disease?

TOR4: DIAGNOSTIC TESTING FACILITIES

10. Did your laboratory carry out diagnostic testing for other WOAH Members?

No

11. Did your laboratory provide expert advice in technical consultancies on the request of an WOAH Member?

No

TOR5: COLLABORATIVE SCIENTIFIC AND TECHNICAL STUDIES

12. Did your laboratory participate in international scientific studies in collaboration with WOAH Members other than the own?

Yes

Title of the study	Duration	Purpose of the study	Partners (Institutions)	WOAH Member Countries involved other than your country
Study on the genome of SVCV isolated in the world	2022~2026	Study on the phylogenetic analyze of SVCV isolates in the world	Centre for Environment, Fisheries and Aquaculture Science, Weymouth	UNITED KINGDOM
validation on the real-time RT-PCR test of SVCV	2024~2026	Recommend comments on the test of real-time RT-PCR test in WOAH manual chapter of SVC	Centre for Environment, Fisheries and Aquaculture Science, Weymouth	UNITED KINGDOM

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

Yes

Research need : 1

Please type the Research need: eDNA test on SVCV in practical cases, such as the biosecurity system of free compartment, or imported koi, or early warning

system in koi or common carp culture

Relevance for WOAH Disease Control, Standard Setting, Facilitation of international collaboration,

Relevance for the Code or Manual Manual,

Field Epidemiology and Surveillance, Diagnostics,

Animal Category Aquatic,

Disease:

Infection with spring viraemia of carp virus

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

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: Aquatic manual Chapter 2.3.9- Infection with spring viraemia of carp virus

Notes:

Answer: We have established methods for SVCV enrichment, in which virus precipitation by polymer compounds and virus flocculation by metal ions can realize highly efficient enrichment of SVCV, with a virus recovery rate of about 90%. Among them, the metal ion 2 could achieve stable and efficient enrichment of low, medium and high concentrations of viruses, and the viral recoveries were all higher than 90%. However, during the optimization of virus enrichment, it was found that virus species, pH value, virus concentration, NaCl, etc. affected the virus enrichment efficiency.

Research need : 2

Please type the Research need: molecular epidemiological study of spring viraemia of carp

Relevance for WOAH Disease Control, Standard Setting, Facilitation of international collaboration,

Relevance for the Code or Manual Manual,

Field Epidemiology and Surveillance,

Animal Category Aquatic,

Disease:

Infection with spring viraemia of carp virus

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

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: Aquatic manual Chapter 2.3.9- Infection with spring viraemia of carp virus

Notes:

Answer: Whole genome sequencing and analysis of SVCV have indicated that the L gene, encoded by SVCV, is the most conserved, while the M gene is the least conserved. All genes of SVCV Ka/Ks values < 1, suggesting purifying selection. And it indicates that the evolution of SVCV is primarily driven by synonymous base substitutions. Gene recombination also contributes to the evolutionary advancement of viruses. Phylogenetic analysis of the identified viruses showed that all SVCVs found in China belong to the Ia genotype. It was also observed that incomplete eradication of SVCV led to persistent infection events in certain regions. Furthermore, the integration of host sequences within the SVCV gene sequences was identified, suggesting an expansion in the potential host range of SVCV.

Research need : 3

Please type the Research need: Establishment of the SVCV RT-RAA detection method

Relevance for WOAH Disease Control, Standard Setting,

Relevance for the Code or Manual Manual,

Field Epidemiology and Surveillance,

Animal Category Aquatic,

Disease:

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

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: Aquatic manual Chapter 2.3.9- Infection with spring viraemia of carp virus

Notes:

Answer: To facilitate rapid field detection of SVCV, the RT-RAA method with isothermal amplification at its was established. This method can rapidly detect the four genotypes of SVCV with high specificity and sensitivity, the lowest detection concentration being 24.2 copies/µl, and detection time of 15 minutes. This method meets the requirements for rapid pathogen diagnosis in the field during suspected SVC outbreaks.

TOR6: EPIZOOLOGICAL DATA

14. Did your Laboratory collect epidemiological data relevant to international disease control?

Yes

If the answer is yes, please provide details of the data collected:

https://wahis.woah.org/#/home

Canada 2024~2025 Inf./infest. in limited zones in wild aquatic animals
P.R.China 2024 Inf./infest. in limited zones in domestic aquatic animals
Hongkong 2025 Suspected in limited zones in domestic aquatic animals
Netherlands 2024 Present and then suspected in both domestic and wild aquatic animals
United States of America 2024 Present in limited zones in wild aquatic animals

15. Did your laboratory disseminate epidemiological data that had been processed and analysed?

Yes

If the answer is yes, please provide details of the data collected:

https://wahis.woah.org/#/home

Canada 2024~2025 Inf./infest. in limited zones in wild aquatic animals
P.R.China 2024 Inf./infest. in limited zones in domestic aquatic animals
Hongkong 2025 Suspected in limited zones in domestic aquatic animals
Netherlands 2024 Present and then suspected in both domestic and wild aquatic animals
United States of America 2024 Present in limited zones in wild aquatic animals

16. What method of dissemination of information is most often used by your laboratory? (Indicate in the appropriate box the number by category and list the details in the box)

a) Articles published in peer-reviewed journals:

5

Kang W, Liao LS, Fang Y, et al., 2024. Establishment of a highly sensitive quantum dot-based fluorescence immunoassay method for on-site diagnosis of spring viraemia of carp virus. Animal Husbandry & Veterinary Medicine, 56 (8): 91-96
Peng Z, Jie S, Lishan L, Zhiheng Z, Rice A, Shishun G, Jiang W, Yumin Z, Lei Z, Hongwei L, Stone D and Hong L (2025) Development and partial validation of an RT-qPCR assay for the rapid detection of spring viremia of carp virus (SVCV). Front. Microbiol. 16:1726705.doi: 10.3389/fmicb.2025.1726705
The status report of important aquatic animal diseases in P. R. China, published by China Agriculture Press, 2025
The epidemiological analysis report of important aquatic animal disease in P. R. China, published by China Agriculture Press, 2025
Prevention and control technology study on the infection with spring viraemia of carp virus in the port under the management of Customs, Wei Kang, doctoral dissertation, 2026, Nanjing Agriculture University

b) International conferences:

5

1.Workshop on reviewing on the regulations of imported and exported animals and heritage substances, July 9th, 2025
2. Training on improve the biosecurity system in the specific pathogen free farms, Yatai, Apr. 15th, 2025

3. Training on improve the detection ability on important aquatic animal diseases, Nanchang, Sep. 23~25th, 2025
4. Meeting of reviewing the 2025 surveillance plan in imported and exported animal and the products and drafting the 2026 surveillance plan in imported and exported animal and the products, Guangzhou, Nov. 17th~21st, 2025
5. Annual meeting on domestic aquatic animal health prevention and control, Beijing, Nov. 18~19th, 2025

c) National conferences:

5
1.Workshop on reviewing on the regulations of imported and exported animals and heritage substances, July 9th, 2025
2. Training on improve the biosecurity system in the specific pathogen free farms, Yatai, Apr. 15th, 2025
3. Training on improve the detection ability on important aquatic animal diseases, Nanchang, Sep. 23~25th, 2025
4. Meeting of reviewing the 2025 surveillance plan in imported and exported animal and the products and drafting the 2026 surveillance plan in imported and exported animal and the products, Guangzhou, Nov. 17th~21st, 2025
5. Annual meeting on domestic aquatic animal health prevention and control, Beijing, Nov. 18~19th, 2025

d) Other (Provide website address or link to appropriate information):

0

TOR7: SCIENTIFIC AND TECHNICAL TRAINING

17. Did your laboratory provide scientific and technical training to laboratory personnel from other WOAH Members?

Yes

a) Technical visit : 0

b) Seminars : 2

c) Hands-on training courses: 0

d) Internships (>1 month) 0

Type of technical training provided (a, b, c or d)	Country of origin of the expert(s) provided with training	No. participants from the corresponding country
B	CHINA (PEOPLE'S REP. OF)	150
B	CHINA (PEOPLE'S REP. OF)	50

TOR8: QUALITY ASSURANCE

18. Does your laboratory have a Quality Management System?

Yes

Quality management system adopted	Certificate scan (PDF, JPG, PNG format)	
ISO17025	PDF	CNAS 17025 certificate.pdf
BSL-2	PDF	BL0035 certificate .pdf
ISO17025	PDF	CNAS 17025 Scope.pdf

19. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
Virus isolation	China National Accreditation Service for Conformity Assessment (CNAS)
Conventional RT-PCR	China National Accreditation Service for Conformity Assessment (CNAS)
real-time RT-PCR	China National Accreditation Service for Conformity Assessment (CNAS)

20. Does your laboratory maintain a "biorisk management system" for the pathogen and the disease concerned?

Yes

Have a series of protocols or procedures to maintain the biorisk management system; Apply for the accreditation of Bio-safety 2 and have a annual audit; Have all the necessary facilities or instruments to meet the requirement of Bio-safety 2 accreditation;

TOR9: SCIENTIFIC MEETINGS

21. Did your laboratory organise scientific meetings related to the pathogen in question on behalf of WOAH?

No

22. Did your laboratory participate in scientific meetings related to the pathogen in question on behalf of WOAH?

Yes

Title of event	Date	location	Role (speaker, presenting poster, short communications)	Title of the work presented
Proespectus for AOH Knowledge and Good Practices Workshop	2025-11-05	Guangzhou	speaker	Establishment of national aquatic pathogen list for inspection and quarantine
Workshop to identify the highest priority research areas for Finfish Health organized by WOAH and STAR-IDAZ IRC, Feb. 20~22 nd, Paris, France	2025-02-18	Paris	speaker	Diagnostic advances on aquatic on aquatic diseases
Veterinary Public Health Workshop 2025	2025-03-01	Hongkong	speaker	Surveillance and standardization on import and export edible animals in China

TOR10: NETWORK WITH WOAH REFERENCE LABORATORIES

23. Did your laboratory exchange information with other WOAH Reference Laboratories designated for the same pathogen or disease?

Yes

24. Are you a member of a network of WOAH Reference Laboratories designated for the same pathogen?

Yes

NETWORK/DISEASE	ROLE OF YOUR LABORATORY (PARTICIPANT, ORGANISER, ETC)	NO. PARTICIPANTS	PARTICIPATING WOAH REF. LABS
Infection with spring viraemia of carp	participant	1	CEFAS, United Kingdom

25. Did you organise or participate in inter-laboratory proficiency tests with WOAH Reference Laboratories designated for the same pathogen during the past 2 years?

Yes

Purpose of the proficiency test:	Role of your Reference Laboratory (organiser/ participant)	No. participating Laboratories	Participating WOAH Ref. Labs/ organising WOAH Ref Lab
Compare the sensitivity of real-time RT-PCR in different laboratories	organiser	11	0

26. Did your laboratory collaborate with other WOAH Reference Laboratories for the same disease on scientific research projects for the diagnosis or control of the pathogen of interest?

Yes

Title of the project or contract	Scope	Name(s) of relevant WOAH Reference Laboratories
Study on the molecular biology of SVCV based on the virus genome sequenced	Molecular epidemiology	CEFAS, United Kingdom

TOR11: OTHER INTERLABORATORY PROFICIENCY TESTING

27. Did your laboratory organise or participate in inter-laboratory proficiency tests with laboratories other than WOAH Reference Laboratories for the same pathogen during the past 2 years?

Yes

Purpose for inter-laboratory test comparisons1	Role of your reference laboratory (organizer/participant)	No. participating laboratories	Name of the test	WOAH Member Countries
To confirm the ability of the virus			virus isolation and identification	CHINA (PEOPLE'S REP.

isolation and laboratory who will join the active surveillance program	Organizer	49	with conventional RT-PCR and real-time RT-PCR	OF),

TOR12: EXPERT CONSULTANTS

28. Did your laboratory place expert consultants at the disposal of WOAH?

No

29. Additional comments regarding your report:

No