WOAH Reference Laboratory Reports Activities 2022

Activities in 2022

This report has been submitted : 7 mars 2023 18:34

Laboratory Information

Name of disease (or topic) for which you are a designated WOAH Reference Laboratory:	Marek's disease	
Address of laboratory:	Ash Road, Pirbright, Woking, Surrey, GU24 0NF UNITED KINGDOM	
Tel.:	+441483231493	
E-mail address:	yongxiu.yao@pirbright.ac.uk	
Website:	https://www.pirbright.ac.uk/diagnostics-surveillance/mareks-disease-virus-reference- laboratory	
Name (including Title) of Head of Laboratory (Responsible Official):	Dr. Yongxiu Yao	
Name (including Title and Position) of WOAH Reference Expert:	Dr. Yongxiu Yao, Head of viral Oncogenesis group	
Which of the following defines your laboratory? Check all that apply:	Academic institution	

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
Direct diagnostic tests		Nationally	Internationally
Real-time PCR for virulent MDV-			

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TOR2: REFERENCE MATERIAL

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

No

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
DNA from virulent Marek's disease virus serotype 1 (vMDV-1, Gallid alphaherpesvirus 2)	Real-time PCR	Produced and provided	0	0.2ml	1	America
DNA from Marek's disease virus serotype 2 (MDV-2, Gallid alphaherpesvirus 3)	Real-time PCR	Produced and provided	0	0.2ml	1	America

4. Did your laboratory produce vaccines?

No

5. Did your laboratory supply vaccines to WOAH Members?

No

TOR3: NEW PROCEDURES

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

No

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

No

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

No

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

No

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?

No

TOR6: EPIZOOLOGICAL DATA

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

No

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

No

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:

15

 Wilson LA, Lewis, Baigent SJ, Abate V, Dolega BA, Morrison LR, Poulos C, Walker D. Marek's Disease in an Indian Peafowl (Pavo cristatus) with Clinical Ocular Disease and Paraparesis. J. Comp. Pathol, 2022. 195: 7-11. DOI: 10.1016/j.jcpa.2022.04.003
Mescolini G, Baigent SJ, Catelli E, Nair VK. Rapid, Sensitive, and Species-Specific Detection of Conventional and Recombinant Herpesvirus of Turkeys Vaccines Using Loop-Mediated Isothermal Amplification Coupled With a Lateral Flow Device Readout. Front. Vet Sci., 2022. 9: 873163. DOI: 10.3389/fvets.2022.873163

3. Zhuang G, Zhao X, Jin J, Zhu X, Wang R, Zhai Y, Lu W, Liao Y, Teng M, Yao Y, Nair V, Yao W, Sun A, Luo J, Zhang G. Infection phasedependent dynamics of the viral and host N6-methyladenosine epitranscriptome in the lifecycle of an oncogenic virus in vivo. J Med Virol. 2022 Nov 18. doi: 10.1002/jmv.28324.

4. Sun A, Zhao X, Zhu X, Kong Z, Liao Y, Teng M, Yao Y, Luo J, Nair V, Zhuang G, Zhang G. Fully Attenuated meq and pp38 Double Gene Deletion Mutant Virus Confers Superior Immunological Protection against Highly Virulent Marek's Disease Virus Infection. Microbiol Spectr. 2022 Nov 9; doi: 10.1128/spectrum.02871-22

5. Zheng L, Teng M, Li G, Zhang W, Wang W, Liu J, Li L, Yao Y, Nair V and Luo J. Current Epidemiology and Co-Infections of Avian Immunosuppressive and Neoplastic Diseases in Chicken Flocks in Central China. Viruses 2022, 14(12), 2599; https://doi.org/10.3390/v14122599

6. Zai X, Shi B, Shao H, Qian K, Ye J, Yao Y, Nair V, Qin A. Recombinant Turkey Herpesvirus expressing H9N2 HA gene from the HVT005/006 site induces better protection than that from the HVT029/031 site. Viruses. 2022, 14(11), 2495; https://doi.org/10.3390/v14112495

7. Teng M, Zhou Z, Yao Y, Nair V, Zhang G, Luo J. A New Strategy for Efficient Screening and Identification of Monoclonal Antibodies against Oncogenic Avian Herpesvirus Utilizing CRISPR/Cas9-Based Gene-Editing Technology. Viruses. 2022, 14(9), 2045; https://doi.org/10.3390/v14092045

8. Teng M, Zheng L, Li H, Ma S, Zhu Z, Chai S, Yao Y, Nair V, Zhang G, Luo J. Pathogenicity and Pathotype Analysis of Henan Isolates of Marek's Disease Virus Reveal Long-Term Circulation of Highly Virulent MDV Variant in China. Viruses. 2022, 14(8), 1651; https://doi.org/10.3390/v14081651

9. Zai X, Shi B, Shao H, Qian K, Ye J, Yao Y, Nair V, Qin A. Identification of a novel insertion site HVT005/006 for the generation of recombinant herpesvirus of turkey (HVT) vector. Front Microbiol. 2022 May 25;13:886873. doi:10.3389/fmicb.2022.886873.

 Calderón K, Rojas-Neyra A, Carbajal-Lévano B, Luján-Valenzuela L, Ticona J, Isasi-Rivas G, Montalván A, Criollo-Orozco M, Huaccachi-Gonzáles E, Tataje-Lavanda L, Alvarez K.L.F, Fernández-Sánchez M, Fernández-Díaz M, Tang N, Yao Y, Nair V. A Recombinant Turkey Herpesvirus Expressing the F Protein of Newcastle Disease Virus Genotype XII Generated by NHEJ-CRISPR/Cas9 and Cre-LoxP Systems Confers Protection Against Genotype XII Challenge in Chickens. Viruses. 2022, 14(4), 793; https://doi.org/10.3390/v14040793
Li W, Zhang Y, Moffat K, Nair V#, Yao Y#. V5 and GFP Tagging of Viral Gene pp38 of Marek's Disease Vaccine Strain CV1988 Using CRISPR/Cas9 Editing. Viruses. 2022, 14(2), 436; https://doi.org/10.3390/v14020436

12. Zhang Y, Li W, Tang N, Moffat K, Nair V#, Yao Y#. Targeted deletion of glycoprotein B gene by CRISPR/Cas9 nuclease inhibits Gallid herpesvirus type 3 in dually-infected Marek's disease virus-transformed lymphoblastoid cell line MSB-1. J Virol, 2022 Feb 2; DOI: https://doi.org/10.1128/jvi.02027-21

13. Boodhoo N., Behboudi S., Marek's disease virus-specific T cells proliferate, express antiviral cytokines but have impaired degranulation response. Front Immunol. 2022 Sep https://doi.org/10.3389/fimmu.2022.973762

14. Matsuyama-Kato A., Iseki H., Boodhoo N., Bavananthasivam J., Alqazlan N., Abdul-Careem MF., Plattner BL., Behboudi S., Sharif S., Phenotypic characterization of gamma delta T cells in chickens infected with or vaccinated against Marek's disease virus. Virology. 2022 January, 25;568:115-125. doi: 10.1016/j.virol.2022.01.012

15. Boodhoo N., Behboudi S., Differential virus-specific IFN-gamma producing T Cell responses to Marek's Disease Virus in chickens with B19 and B21 MHC haplotypes. Frontiers in Immunology, 2022 January, https://doi.org/10.3389/fimmu.2021.784359

b) International conferences:

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Professor Venugopal Nair and Dr. Sue Baigent presented at International Veterinary Vaccinology Network Sponsored Online Workshop on "MAREK'S DISEASE OF CHICKEN - GLOBAL DISCUSSION ON CONTROL STRATEGIES FOR LOCAL MITIGATION". Hosted by Tamil Nadu Veterinary and Animal Sciences University, India (16th November 2022).

Title of the talks:

• V Nair: MDV – A Global perspective

• S Baigent: Marek's disease diagnostics at the Pirbright Institute's MDV Reference Laboratory

c) National conferences:

1

Dr. Sue Baigent organised "UK Poultry Disease Group meeting" online meeting and answered questions relevant to Marek's disease in the general discussion, 18th July 2022

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

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TOR7: SCIENTIFIC AND TECHNICAL TRAINING

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

No

TOR8: QUALITY ASSURANCE

18. Does your laboratory have a Quality Management System?

Y	e	s
•	-	-

Quality management system adopted	Certificate scan (PDF, JPG, PNG format)	
		Pirbright UKAS Certificate.pdf

19. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body	
Identification of Marek's Disease Virus (vMDV, CVI988, MDV-2 and	United Kingdom Accreditation Service (UKAS) 17025	
HVT) in chicken organs, feathers, and poultry house dust		

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

MDV (including MDV serotypes 1, 2 and HVT) causes diseases in poultry species such as chickens, turkey and quails. The viruses are exclusive pathogens of avian species and hence are unlikely to infect and cause any harm to the human. Also, no known risks to the environment have been associated with these viruses. However, sample preparation for qPCR and when the culture of the virus is involved, strictly all of the work will be performed with the appropriate PPE (nitrile gloves and lab coat); and in containment level 2 environment solely for sample protection, and for sterility of cultures in line with group practices for culture of avian herpesviruses.

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?

No

TOR10: NETWORK WITH WOAH REFERENCE LABORATORIES

23. Did your laboratory exchange information with other WOAH Reference Laboratories designated for the same pathogen or disease? Not applicable (only WOAH Reference Laboratory designated for the disease

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

Not applicable (Only WOAH Reference Laboratory designated for the disease)

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

Not applicable (Only WOAH Reference Laboratory designated for the disease)

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?

Not applicable (Only WOAH Reference Laboratory designated for the disease)

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?

No

TOR12: EXPERT CONSULTANTS

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

No

29. Additional comments regarding your report:

Yes

MDVRL activities have increased in terms of sample submissions, diagnosis advice and requests for methods and protocols. Specifically, the samples submitted from overseas increased significantly from 1 in 2021 to 326 in 2022. We also worked on developing and validating a real-time PCR specific for Prevexxion vaccine. We continue to provide technical advise to queries from many member countries. Most of the activities are carried out using the funding from the Pirbright Institute MDVRL or from charges for the tests, as we do not receive any funding support from the WOAH.