

# OIE Reference Laboratory Reports Activities

## *Activities in 2016*

**This report has been submitted : 2017-01-25 20:32:00**

<b>Name of disease (or topic) for which you are a designated OIE Reference Laboratory:</b>	Rabbit haemorrhagic disease
<b>Address of laboratory:</b>	Via A. Bianchi No. 7/9 25124 Brescia ITALY
<b>Tel.:</b>	+39-30 229 06 17
<b>Fax:</b>	+39-30 229 05 59
<b>E-mail address:</b>	lorenzo.capucci@izsler.it
<b>Website:</b>	<a href="http://www.izsler.it/izs_home_page/servizi/00000115_Internazionali.html">http://www.izsler.it/izs_home_page/servizi/00000115_Internazionali.html</a>
<b>Name (including Title) of Head of Laboratory (Responsible Official):</b>	Prof. Stefano Cinotti IZSLER General Manager
<b>Name (including Title and Position) of OIE Reference Expert:</b>	Lorenzo Capucci Biologist Head of Proteomic Unit
<b>Which of the following defines your laboratory? Check all that apply:</b>	Governmental

**ToR 1: To use, promote and disseminate diagnostic methods validated according to OIE Standards**

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 OIE Manual (Yes/No)	Total number of test performed last year	
		Nationally	Internationally
Indirect diagnostic tests		Nationally	Internationally
RHDV Competition ELISA	yes	1323	76
RHDV2 Competition ELISA	yes	1402	71
RHDV Isotype ELISA	yes	1280	55
RHDV2 Isotype ELISA	yes	1370	55
EBHSV Competition ELISA	yes	1489	1423
Direct diagnostic tests		Nationally	Internationally
RHDV Sandwich ELISA	yes	317	6
PCR RHDV	yes	20	0
EBHSV Sandwich ELISA	yes	419	0
PCR EBHSV	yes	59	0
PCR RHDV2	yes	25	0
MAb typing ELISA RHDV	no	213	6

**ToR 2: To develop reference material in accordance with OIE requirements, and implement and promote the application of OIE Standards.  
To store and distribute to national laboratories biological reference products and any other reagents used in the diagnosis and control of the designated pathogens or disease.**

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

No

3. Did your laboratory supply standard reference reagents (non OIE-approved) and/or other diagnostic reagents to OIE Member Countries?

Yes

Type of reagent available	Related diagnostic test	Produced/ provide	Amount supplied nationally (ml, mg)	Amount supplied internationally (ml, mg)	No. of recipient OIE Member Countries	Region of recipients
RHDV serological kit	c-ELISA	produced	4	5	2	<input type="checkbox"/> Africa <input checked="" type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Middle East
EBHSV serological kit	c-ELISA	produced	2	10	1	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Middle East
RHDV/EBHSV virological kit	MAbs sandwich ELISA	produced	18	12	3	<input type="checkbox"/> Africa <input checked="" type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Middle East
RHDV2 serological kit	c-ELISA	produced	0	7	2	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Middle East

4. Did your laboratory produce vaccines?

Yes

5. Did your laboratory supply vaccines to OIE Member Countries?

Yes

Vaccine name	Amount supplied nationally (ml, mg) (including for own use)	Amount supplied to other countries (ml, mg)	Name of recipient OIE Member Countries
RHDV2 autovaccine	50000	0	ITALY
EBHS autovaccine	5000	100	GERMANY

**ToR 3: To develop, standardise and validate, according to OIE Standards, new procedures for diagnosis and control of the designated pathogens or diseases**

6. Did your laboratory develop new diagnostic methods validated according to OIE Standards for the designated pathogen or disease?

Yes

7. Did your laboratory develop new vaccines according to OIE Standards for the designated pathogen or disease?

No

Name of the new test or diagnostic method or vaccine developed	Description and References (Publication, website, etc.)
RHDV2 serological c-ELISA (MP 04/158)	Chapter 2.6.2 OIE terrestrial manual 114. VELARDE ROSER, CAVADINI PATRIZIA, NEIMANIS ALEKSIIJA, CABEZÓN OSCAR, CHIARI MARIO, GAFFURI ALESSANDRA, LAVÍN SANTIAGO, GRILLI GUIDO, GAVIER-WIDÉN DOLORES, LAVAZZA ANTONIO, CAPUCCI LORENZO Spillover events of infection of brown hares ( <i>Lepus europaeus</i> ) with rabbit haemorrhagic disease type 2 virus (RHDV2) caused sporadic cases of an European Brown hare syndrome like-disease in Italy and Spain. Transboundary and Emerging Diseases Version of Record online: 11 SEP 2016   DOI: 10.1111/tbed.12562

**ToR 4: To provide diagnostic testing facilities, and, where appropriate, scientific and technical advice on disease control measures to OIE Member Countries**

8. Did your laboratory carry out diagnostic testing for other OIE Member Countries?

Yes

Name of OIE Member Country seeking assistance	Date (month)	No. samples received for provision of diagnostic support	No. samples received for provision of confirmatory diagnoses
GERMANY	July 2016	977 (hare sera)	0
PORTUGAL	February 2016	177 (hare sera)	0
SPAIN	April 2016	104 (hare sera)	0
BULGARIA	April 2016	90 (rabbit sera) 115 (hare sera)	0
FRANCE	November 2016	48 (sera)	6 (rabbit livers)
NORWAY	July 2016	0	3 (rabbit livers)

9. Did your laboratory provide expert advice in technical consultancies on the request of an OIE Member Country?

Yes

Name of the OIE Member Country receiving a technical consultancy	Purpose	How the advice was provided
HUNGARY	To give information on the protocol preparation of RHDV2 autovaccines	By exchanging email messages
CHILE	To give information and RT-PCR protocol for RHDV detection	By exchanging email messages including the detailed protocol of the RT-PCR method
SWITZERLAND	To support and indications for RHD2 diagnosis	By exchanging email messages
FRANCE	To give information on management of a RHDV2 outbreak in farmed rabbits and indication on control and prevention program	By exchanging email messages and during a technical visit
DENMARK	To give information regarding presence and way of transmission of RHDV2	By exchanging email messages
THE NETHERLANDS	To give omments on cross protection induced by different RHDV strains and indication on RHDV2 diagnosis and control measures	By exchanging email messages
BELGIUM	To give indication on RHDV2 diagnosis	By exchanging email messages
GERMANY	To give comments on measures applied to prevent and control RHD and on the management of RHDV2 outbreaks	By exchanging email messages
UNITED STATES OF AMERICA	To give comments on experiemntal infections of rabbits and cottontails with RHDV2	By exchanging email messages and by providing reference strains
UNITED KINGDOM	To give information about RHDV2 vaccines, cross protection and how to perform diagnosis and field control of RHDV2 cases	By exchanging email messages and by providing reference controls

***ToR 5: To carry out and/or coordinate scientific and technical studies in collaboration with other laboratories, centres or organisations***

10. Did your laboratory participate in international scientific studies in collaboration with OIE Member Countries other than the own?

Yes

Title of the study	Duration	Purpose of the study	Partners (Institutions)	OIE Member Countries involved other than your country
ANIHWA-ECALEP Emergence of highly pathogenic CALICIVIRUSES in Leporidae through species jumps involving reservoir host introduction	3 years	The project aims at studying the emergence and reemergence of pathogenic lagoviruses, notably by exploring the hypothesis of a species jump involving introduction of a reservoir host species.	ANSES(France) ONCFS (France) INRA/ENVIT(France) INSERM (France) SVA (Sweden) IZSLER (Italy) CIBIO (Portugal)	FRANCE PORTUGAL SWEDEN
Study and examination of rabbit and brown hare diseases	3 years	The scientific collaboration aims to investigate by virological and serological methods the presence and incidence of diseases in wild and domestic rabbit and brown hare in Bulgaria	University of Forestry, Faculty of Veterinary Medicine, Sofia	BULGARIA
Scientific Collaboration	1 year	Diagnosis of antibodies from Brown hares ( <i>Lepus europaeus</i> ) sera against several lagoviruses.	Institute for Terrestrial and Aquatic Wildlife Research, University of Veterinary Medicine, Hannover, Germany	GERMANY

**ToR 6: To collect, process, analyse, publish and disseminate epizootiological data relevant to the designated pathogens or diseases**

11. Did your Laboratory collect epizootiological data relevant to international disease control?

Yes

12. Did your laboratory disseminate epizootiological data that had been processed and analysed?

Yes

**13. What method of dissemination of information is most often used by your laboratory? (Indicate in the appropriate box the number by category)**

a) Articles published in peer-reviewed journals: 2

1) VELARDE R., CAVADINI P., NEIMANIS A., CABEZÓN O., CHIARI M., GAFFURI A., LAVÍN SANTIAGO, GRILLI G., GAVIER-WIDÉN D., LAVAZZA A., CAPUCCI L. Spillover events of infection of brown hares (*Lepus europaeus*) with rabbit haemorrhagic disease type 2 virus (RHDV2) caused sporadic cases of an European Brown hare syndrome like-disease in Italy and Spain. *Transboundary and Emerging Diseases* Version of Record online: 11 SEP 2016 | DOI: 10.1111/tbed.12562

2) CHIARI M., MOLINARI S., CAVADINI P., BERTASI B., ZANONI MG., CAPUCCI L., LAVAZZA A. Red foxes (*Vulpes vulpes*) feeding brown hares (*Lepus europaeus*) infected by European Brown Hare Syndrome virus (EBHSV) might be involved in the indirect transmission of the disease. *European Journal of Wildlife Research*. *Eur J Wildl Res* DOI 10.1007/s10344-016-1055-4

b) International conferences: 10

5th World Lagomorph Conference, Stanislaus California State University, Turlock 11-15 July 2016

1) Velarde Nieto R., Cavadini P., Neimanis A., Chiari M., Cabezón O., Lavín S., Gaffuri A., Grilli G., Gavier-Widén D., Lavazza A., Capucci L. Detection of the New Emerging Rabbit Hemorrhagic Disease Type 2 Virus (RHDV2) in European Brown Hares (*Lepus Europaeus*) from Italy and Spain. pag 66

2) Cavadini P., Molinari S., Pezzoni G., Chiari M., Brocchi E., Lavazza A., Capucci L. Identification of a New Non-Pathogenic Lagovirus in Brown Hares (*Lepus europeus*). pag 81

3) Chiari M., Molinari S., Cavadini P., Bertasi B., Capucci L., Lavazza A. Praying Hares is the Sole Method Used by Carnivores for Causing Their Death? pag 82

12th Conference of the European Wildlife Disease Association (EWDA) 27- 31 August 2016, Berlin, Germany

4) Lavazza Antonio, Cavadini Patrizia, Chiari Mario, Molinari Stefano, Capucci Lorenzo New insights of Lagovirus infection in wild rabbits and hares. pag 11

5) Velarde Roser, Lavazza Antonio, Cavadini Patrizia, Chiari Mario, Neimanis Aleksija, Cabezón Oscar, Lavín Santiago, Gaffuri Alessandra, Grilli Guido, Gavier-Widén Dolores, Capucci Lorenzo. Detection of the new emerging rabbit hemorrhagic disease type 2 virus (RHDV2) in European brown hares (*Lepus europaeus*) from Spain and Italy. pag 14

6) Neimanis Aleksija, Ahola Harri, Zohari Siamak, Capucci Lorenzo, Gavier-Widén Dolores Emergence of Rabbit Haemorrhagic Disease Virus-2 (RHDV2) in wild and domestic rabbits (*Oryctolagus cuniculus*) in Sweden. pag 15

7) Salvioli Monica, Chiari Mario, Lavazza Antonio, Pasquali Sara, Zanoni Mariagrazia, Capucci Lorenzo, Gilioli Gianni. An epidemiological model for the European Brown hare Syndrome (EBHS). pag 47

8) Chiari Mario, Molinari Stefano, Cavadini Patrizia, Bertasi Barbara, Zanoni Mariagrazia, Capucci Lorenzo, Lavazza Antonio. Praying brown hares (*Lepus europaeus*) is the sole method used by red fox (*Vulpes vulpes*) for causing their death? pag 110

9) Paternolli Sabrina, Lavazza Antonio, Dellamaria Debora, Cavadini Patrizia, Bano Luca, Natale Alda, Obber Federica, Tezzele Roberto, Luchesa Lucio, Capucci Lorenzo. Three year follow-up of an outbreak of Rabbit Haemorrhagic Disease due to RHDV2 in wild rabbits (*Oryctolagus cuniculus*) in North-Eastern Italy. pag 159

2016 ACVP and ASVCP Concurrent Annual Meeting December 3-7, 2016, New Orleans, LA

10) Dana Hill, Karen Moran, Alexa Bracht, Karyn Havas, Fernando Torres-Velez, Lorenzo Capucci, Fawzi Mohamed OPTIMIZING DIAGNOSTICS FOR RABBIT HEMORRHAGIC DISEASE VIRUS-2--AN EMERGING FATAL HEPATITIS THREATENING RABBITS AND HARES IN EUROPE

c) National conferences: 4

X Congresso Italiano di Teriologia Acquapendente (VT) 20-23 aprile, 2016 Hystrix, The Italian Journal of Mammalogy, 2016 Volume 27 (Supplement)

1) Salvioli M., Lavazza A., Zanoni M., Chiari M., Gilioli G. An epidemiological model for the European brown hare syndrome (EBHS). pag. 23.

2) Chiari M., Molinari S., Cavadini P., Bertasi B., Lavazza A., Capucci L. Praying hares is the sole method used by carnivores for causing their death? pag. 87.

6° Workshop di Virologia Veterinaria. 13-14 Ottobre 2016 Torino

3) Cavadini Patrizia, Molinari Stefano, Chiari Mario, Pezzoni Giulia, Brocchi Emiliana, Stalder Gabrielle, Posautz Annika, Capucci Lorenzo, Lavazza Antonio. Presenza e diffusione in europa del hare calicivirus (HaCV), un lagovirus non patogeno della lepre bruna (*Lepus europaeus*). pag 54

4) Capucci Lorenzo, Patrizia Cavadini, Schiavitto Michele, Lombardi Guerino, Lavazza Antonio Evoluzione dell'RHDV2 verso l'alta patogenicità: urgenza di un vaccino omologo per la tutela della zootecnia. pag 69

d) Other:

(Provide website address or link to appropriate information) 2

1. LAVAZZA A., COOKE B.D. " Lagomorphs Diseases Chapter " in: Smith A.T, Johnstone C.H. Alves P., Hackländer K. "Lagomorphs of the world" Johns Hopkins University Press, Baltimore, Maryland (USA)

2. Web-site link:

[http://www.izsler.it/izs\\_home\\_page/servizi/00003936\\_OIE\\_Reference\\_Laboratory\\_for\\_Rabbit\\_Haemorrhagic\\_Diseases.html](http://www.izsler.it/izs_home_page/servizi/00003936_OIE_Reference_Laboratory_for_Rabbit_Haemorrhagic_Diseases.html)



**ToR 7: To provide scientific and technical training for personnel from OIE Member Countries****To recommend the prescribed and alternative tests or vaccines as OIE Standards**

14. Did your laboratory provide scientific and technical training to laboratory personnel from other OIE Member Countries?

Yes

- a) Technical visits: 1  
 b) Seminars: 0  
 c) Hands-on training courses: 1  
 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
c	Germany	1
a	France	2

**ToR 8: To maintain a system of quality assurance, biosafety and biosecurity relevant for the pathogen and the disease concerned**

15. Does your laboratory have a Quality Management System certified according to an International Standard?

Yes

Quality management system adopted	Certificate scan (PDF, JPG, PNG format)
UNI CEI EN ISO/IEC 17025	CERTIFICATO ACCREDITAMENTO 20150928.pdf

16. Is your laboratory accredited by an international accreditation body?

Yes

Test for which your laboratory is accredited	Accreditation body
PCR	ILAC MRA, ACCREDIA
Serological Competitive RHDV-ELISA	ILAC MRA, ACCREDIA
Serological Competitive EBHSV-ELISA	ILAC MRA, ACCREDIA
Virological sandwich MAb RHDV/EBHSV-ELISA	ILAC MRA, ACCREDIA
Immunohistochemistry	ILAC MRA, ACCREDIA
Electron Microscopy negative staining methods	ILAC MRA, ACCREDIA

17. Does your laboratory maintain a “biorisk management system” for the pathogen and the disease concerned?

Yes

(See *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals, Chapter 1.1.4*)

### **ToR 9: To organise and participate in scientific meetings on behalf of the OIE**

18. Did your laboratory organise scientific meetings on behalf of the OIE?

No

19. Did your laboratory participate in scientific meetings on behalf of the OIE?

Yes

Title of event	Date (mm/yy)	Location	Role (speaker, presenting poster, short communications)	Title of the work presented
84°OIE GENERAL SESSION	May 2016	Paris (France)	Member of the Italian delegation	none
5° World Lagomorph Conefrence	July 2016	Turlock (CA, USA)	Speaker	Detection of the New Emerging Rabbit Hemorrhagic Disease Type 2 Virus (RHDV2) in European Brown Hares ( <i>Lepus Europaeus</i> ) from Italy and Spain.
12° Conference of the European Wildlife Disease Association (EWDA)	August 2016	Berlin (Germany)	Speaker	New insights of Lagovirus infection in wild rabbits and hares
12° Conference of the European Wildlife	August 2016	Berlin (Germany)	Presenting poster	1) Praying brown hares ( <i>Lepus europaeus</i> ) is the sole method used by red fox ( <i>Vulpes vulpes</i> ) for causing their death? pag 110 2) Three year follow-up of an outbreak of Rabbit Haemorrhagic Disease due to RHDV2 in wild rabbits ( <i>Oryctolagus cuniculus</i> ) in North-EasternItaly. pag 159
5° World Lagomorph Conefrence	July 2016	Turlock (CA, USA)	Presenting poster	1) Identification of a New Non-PathogenicLagovirus in Brown Hares ( <i>Lepus europeaus</i> ). 2) Praying Hares is the Sole Method Used by Carnivores for Causing Their Death?

**ToR 10: To establish and maintain a network with other OIE Reference Laboratories designated for the same pathogen or disease and organise regular inter-laboratory proficiency testing to ensure comparability of results**

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

Not applicable (Only OIE Reference Lab. designated for disease)

21. Was your laboratory involved in maintaining a network with OIE Reference Laboratories designated for the same pathogen or disease by organising or participating in proficiency tests?

Not applicable (Only OIE Reference Lab. designated for disease)

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

Not applicable (Only OIE Reference Lab. designated for disease)

**ToR 11: To organise inter-laboratory proficiency testing with laboratories other than OIE Reference Laboratories for the same pathogens and diseases to ensure equivalence of results**

23. Did your laboratory organise or participate in inter-laboratory proficiency tests with laboratories other than OIE Reference Laboratories for the same disease?

Yes

Note: See Interlaboratory test comparisons in: Laboratory Proficiency Testing at: <http://www.oie.int/en/our-scientific-expertise/reference-laboratories/proficiency-testing> see point 1.3

Purpose for inter-laboratory test comparisons <sup>1</sup>	No. participating laboratories	Region(s) of participating OIE Member Countries
Set up of diagnostic test (ELISA and PCR) for RHDV, RHDV2 and EBHSV by furnishing positive and negative control samples	1 (UK), 1 (CH), 1 (N)	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Middle East

**ToR 12: To place expert consultants at the disposal of the OIE**

24. Did your laboratory place expert consultants at the disposal of the OIE?

Yes

Kind of consultancy	Location	Subject (facultative)
Updating of the chapter on RHDV (2.06.02) for the OIE Terrestrial manual	Brescia	We have integrated in the chapter all the information and methods regarding the new strain RHDV2. The chapter has been approved and adopted during the 84 <sup>o</sup> OIE General Conference in May this year.

## 25. Additional comments regarding your report:

During 2016 the laboratory has worked for field validation of specific serological and virological test (cELISA and isotype\_ELISAs and RT-PCR) towards the RHDV2.

More data were acquired on its diffusion, antigenic, genomic and pathological (virulence) characteristics as well as its capacity to infect other lagomorph species (in particular brown hares).

Support to the diagnosis of this new virus was given to different OIE member countries.

The specific methods are now described in the updated chapter for the OIE Terrestrial Manual