Diarreas de etiología vírica en el ganado porcino

Ana Carvajal Urueña

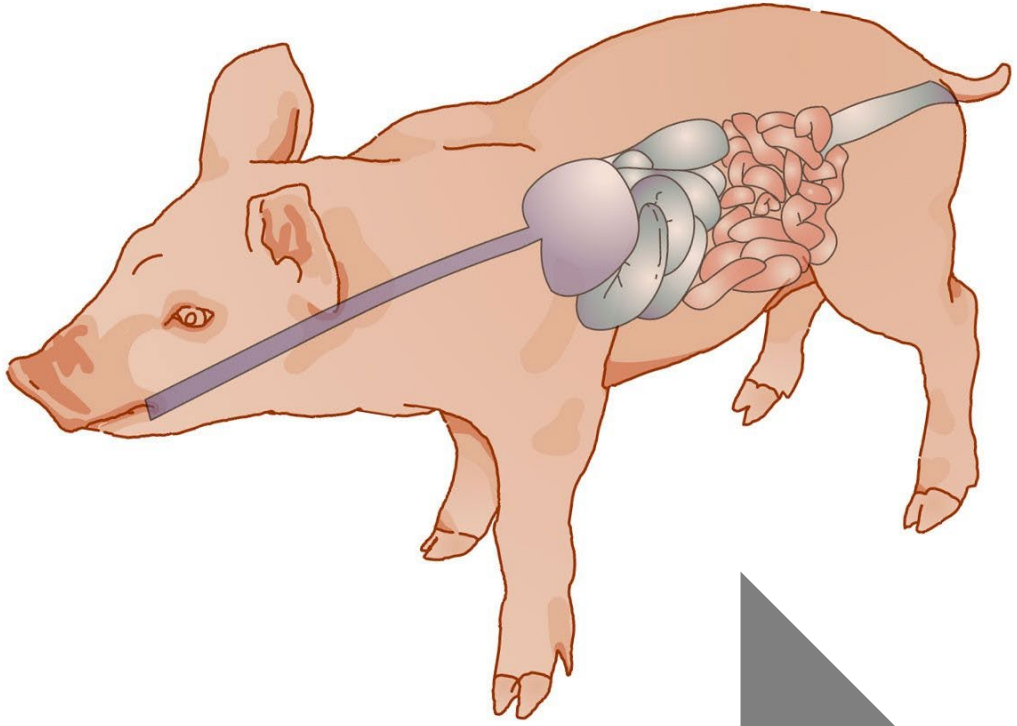
DIGESPORC

Universidad de León

Funciones del TGI

Complejo entérico: concepto y relevancia

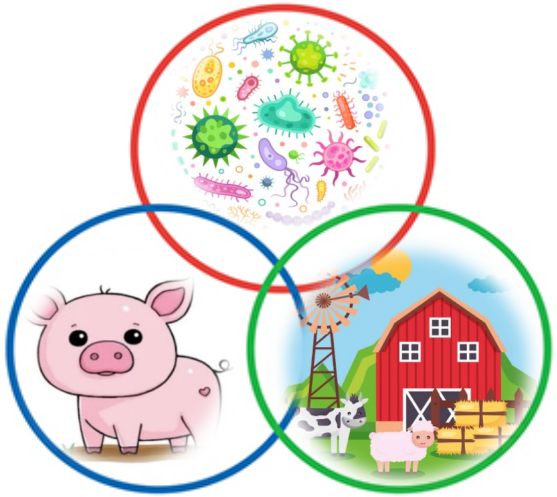
Fisiología digestiva en distintas etapas de la producción porcina

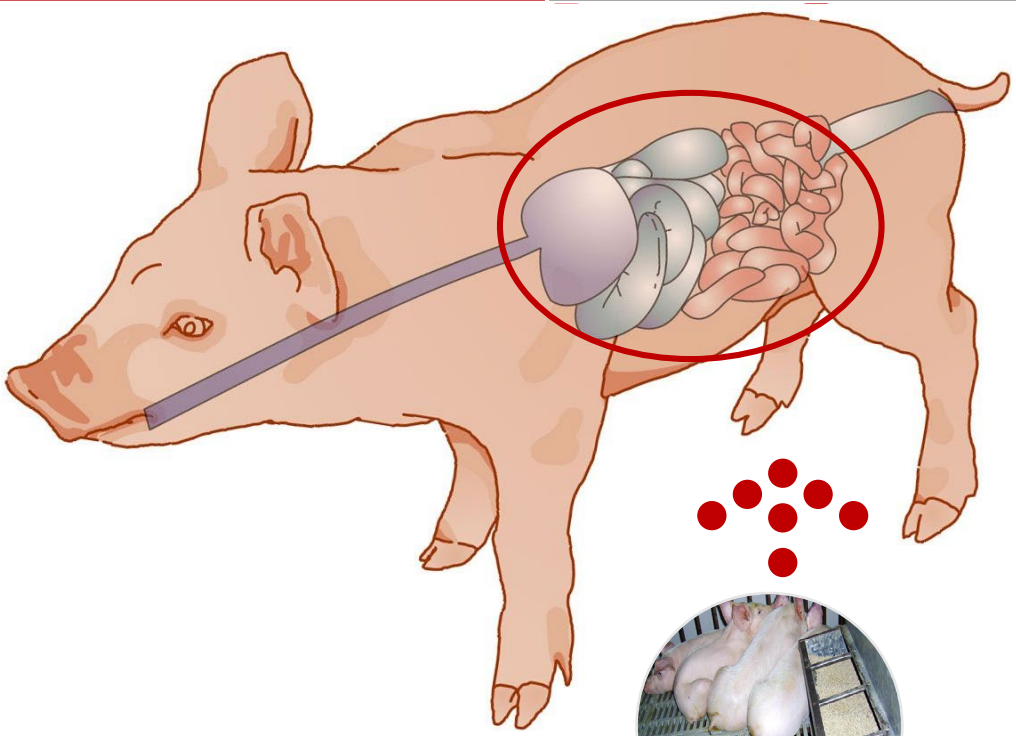


Digestión

Absorción

Barrera





Complejo entérico

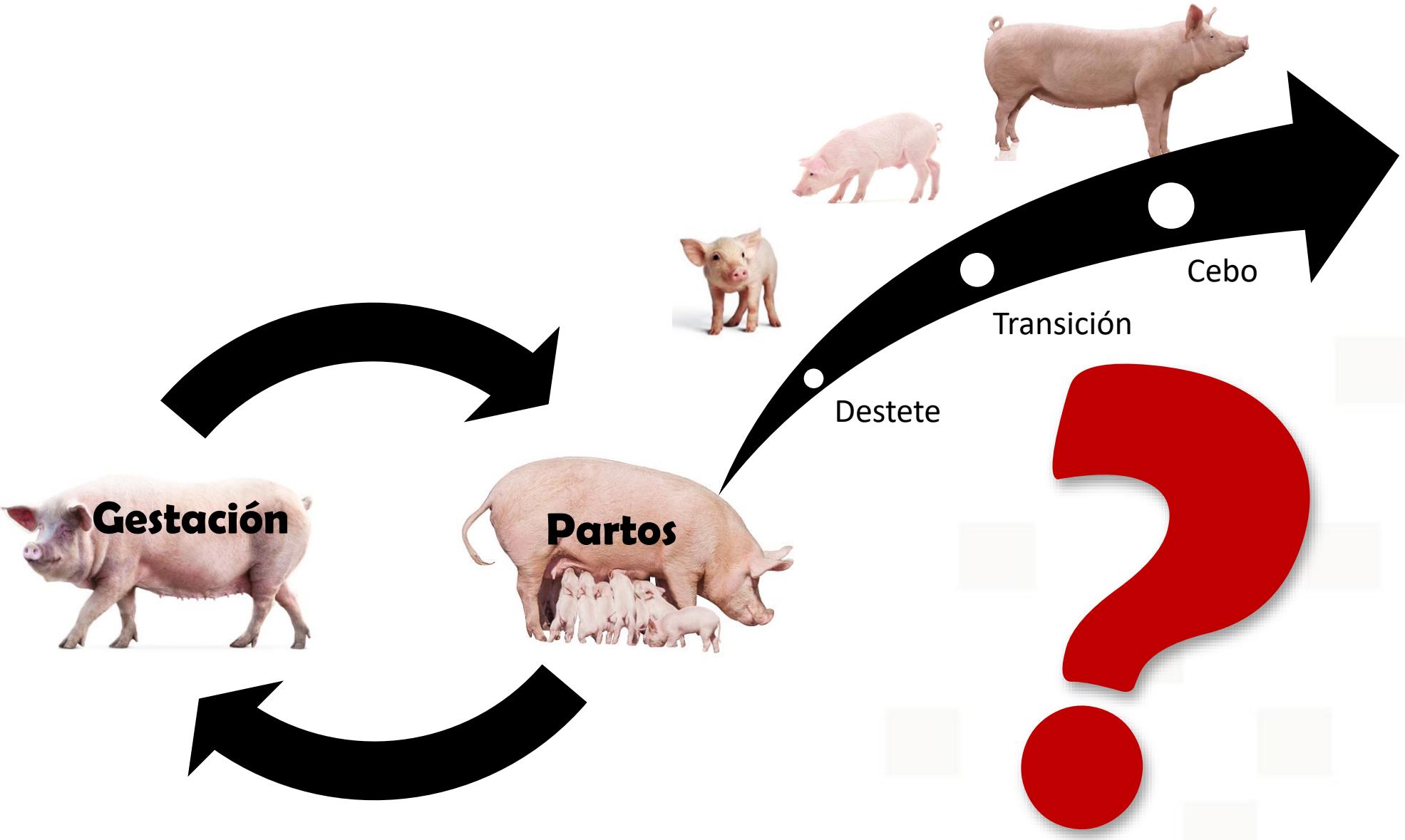
Anorexia

Diarrea

Bienestar animal

Mortalidad y coste asociado a tratamiento/control

Disminución del rendimiento como transformador


Gestación
Partos
Destete
Transición
Cebo

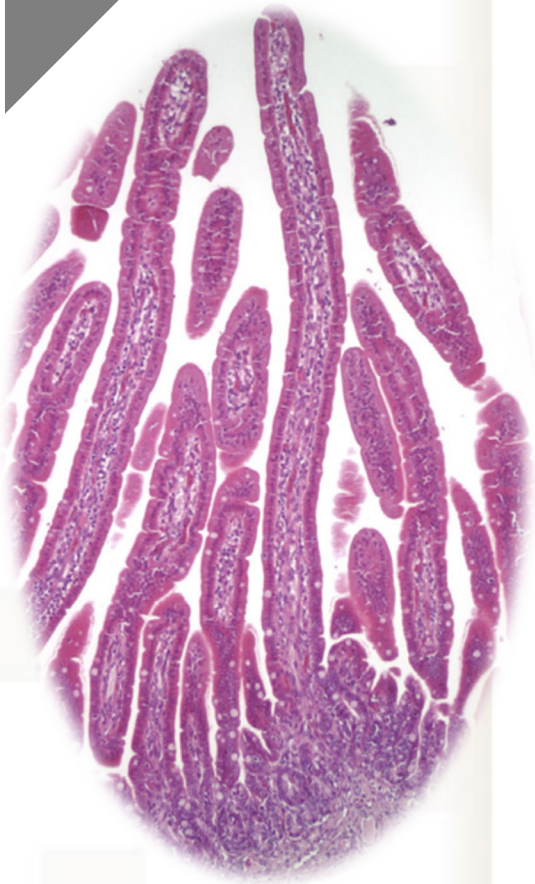
Lactación

Digestión → **Absorción** → **Barrera**

Lactación

Digestión → **Absorción** → **Barrera**

Dieta líquida
20-24 tomas/día
Altamente digestible
Tª adecuada

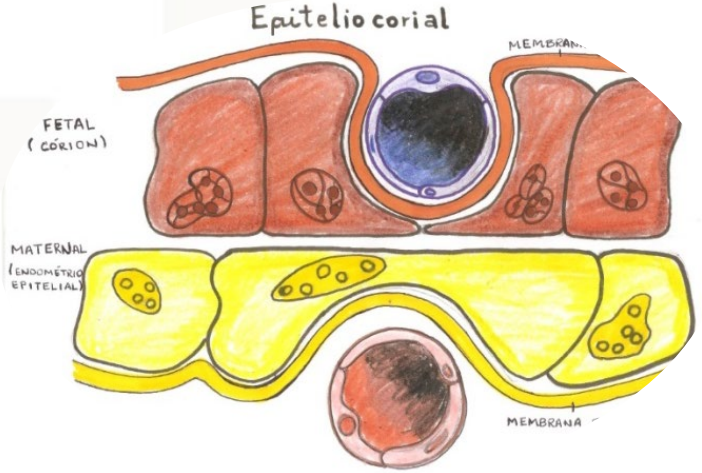


Lactación

Digestión → **Absorción** → **Barrera**

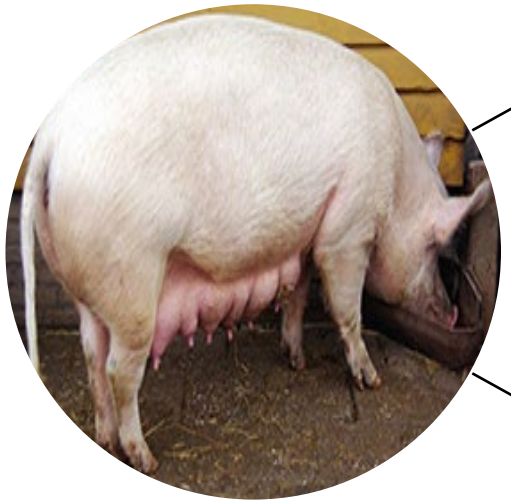
Actividad antitripsina del calostro
Permeabilidad de las uniones intercelulares
GALT inmaduro
Microbiota en adquisición

+ lechón agammaglobulinémico



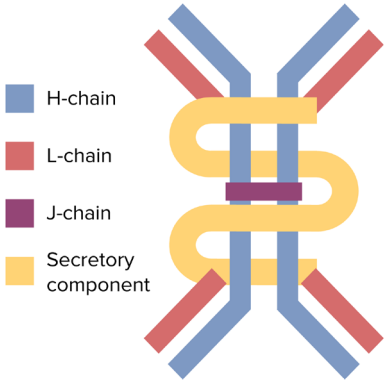
Lactación

Digestión → **Absorción** → **Barrera**



- Inmunidad pasiva sistémica

- Inmunidad pasiva local



Destete

Digestión → **Absorción** → **Barrera**

Destete

Digestión → **Absorción** → **Barrera**

- Destete entre los 21 y 28 días
- Cambio brusco de alimento
  - Anorexia
  - Enlentecimiento del tránsito digestivo
  - Modificación de la microbiota
- Desaparece la protección pasiva
  - Desaparición progresiva de IgA maternas del lumen intestinal
- Inmadurez del sistema inmunitario
- Estrés
  - Separación de la madre
  - Nueva ubicación
  - Nuevos compañeros

Digestión → **Absorción** → **Barrera**

Cebo

?

Digestión

Absorción

Barrera

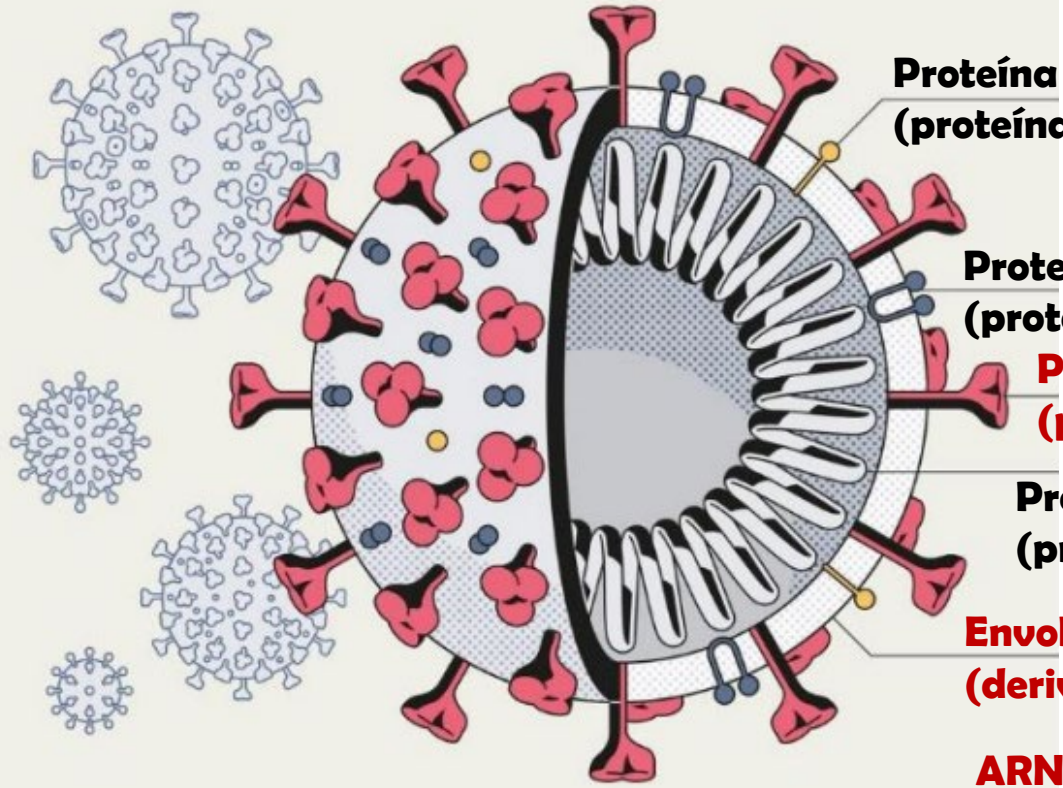
Cebo

?

?

- Coronavirus
- Rotavirus
- Otros virus

- **Coronavirus**
- Rotavirus
- Otros virus



Proteína de la envoltura
(proteína E)

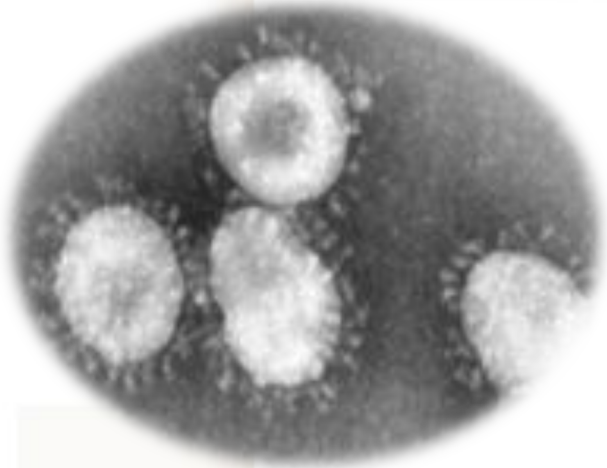
Proteína de membrana
(proteína M)

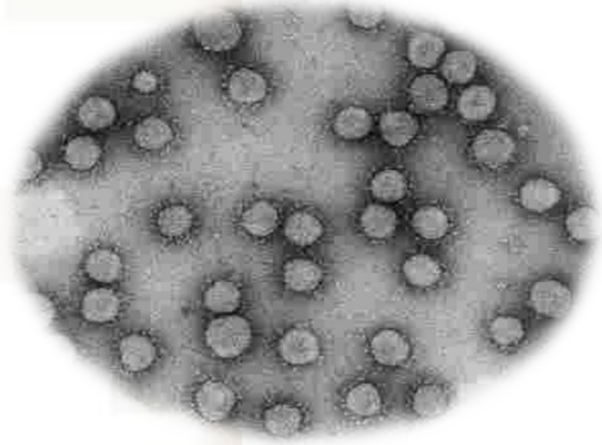
Proteína de la espícula
(proteína S)

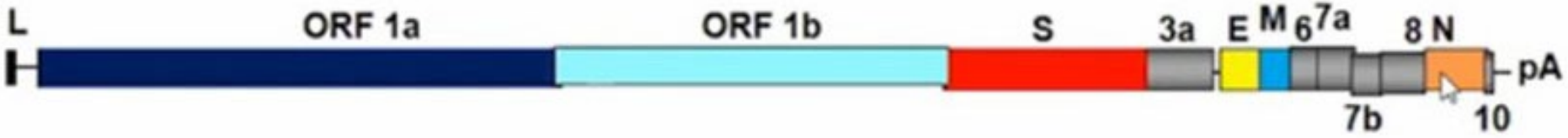
Proteína de la nucleocápside
(proteína N)

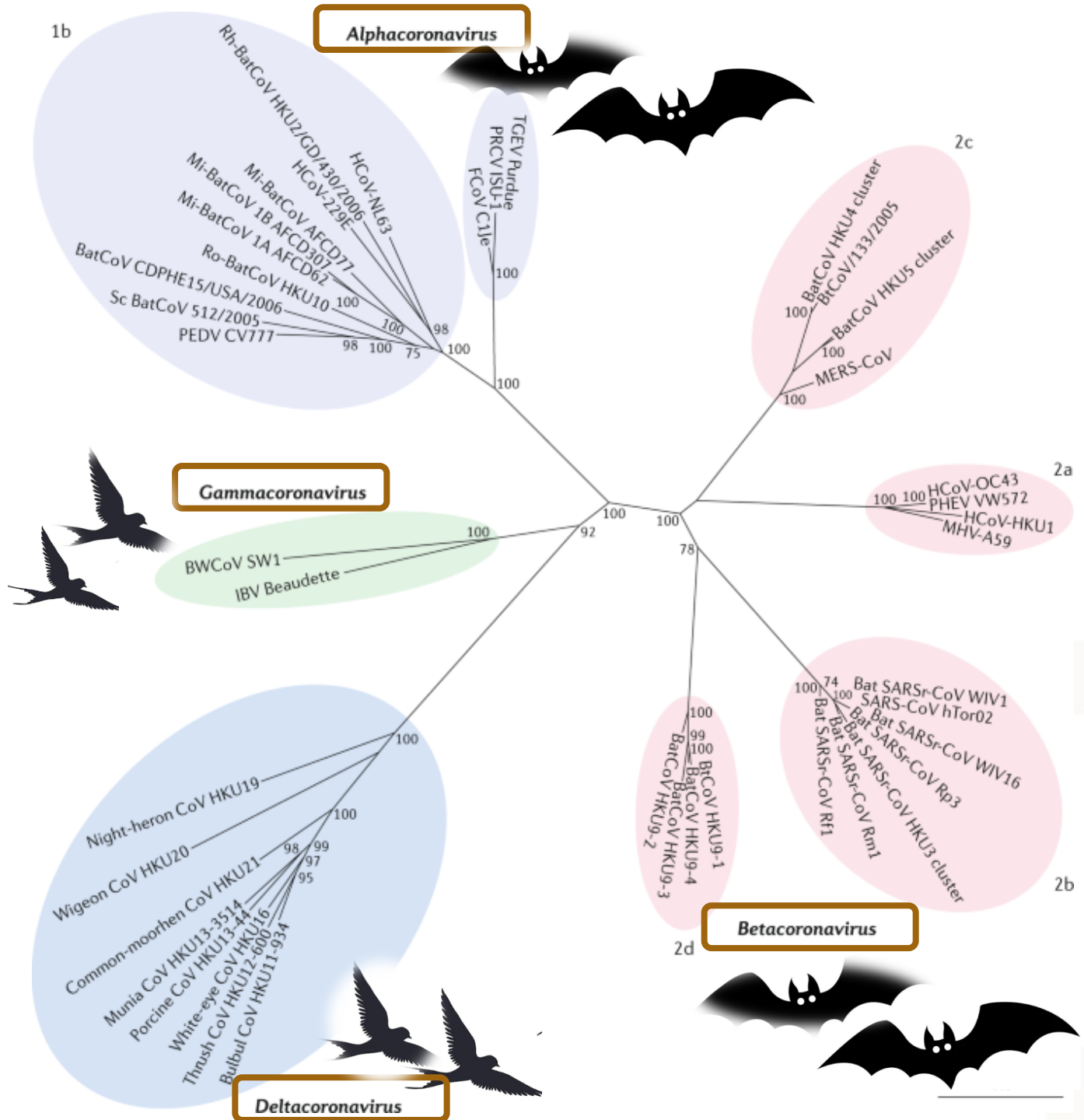
Envoltura
(derivada de la célula hospedadora)

ARN monocatenario (+)








Alphacoronavirus
1b
Rh-BatCoV HKU2/GD/430/2006
HCoV-NL63
HCoV-229E
Mi-BatCoV AFCD77
Mi-BatCoV 1B AFCD307
Mi-BatCoV 1A AFCD62
Ro-BatCoV HKU10
BatCoV CDPHE15/USA/2006
Sc BatCoV 512/2005
PEDV CV777
TGEV Purdue
PRCV ISU1
FCoV C1je
2c
BatCoV HKU4 cluster
BtCoV/133/2005
BatCoV HKU5 cluster
MERS-CoV
2a
HCoV-OC43
PHEV VW572
HCoV-HKU1
MHV-A59
Gammacoronavirus
BWCoV SW1
IBV Beaudette
2d
Betacoronavirus
Bat SARSr-CoV WIV1
SARS-CoV hTor02
Bat SARSr-CoV WIV16
Bat SARSr-CoV Rp3
Bat SARSr-CoV HKU3 cluster
Bat SARSr-CoV Rm1
Bat SARSr-CoV Rf1
BtCoV HKU9-1
BatCoV HKU9-4
BatCoV HKU9-3
BatCoV HKU9-2
2b
Night-heron CoV HKU19
Wigeon CoV HKU20
Common-moorhen CoV HKU21
Munia CoV HKU13-3514
Porcine CoV HKU13-44
White-eye CoV HKU16
Thrush CoV HKU12-600
Bulbul CoV HKU11-934
Deltacoronavirus

TGEV

PEDV

PDCoV

SECoV

SADS

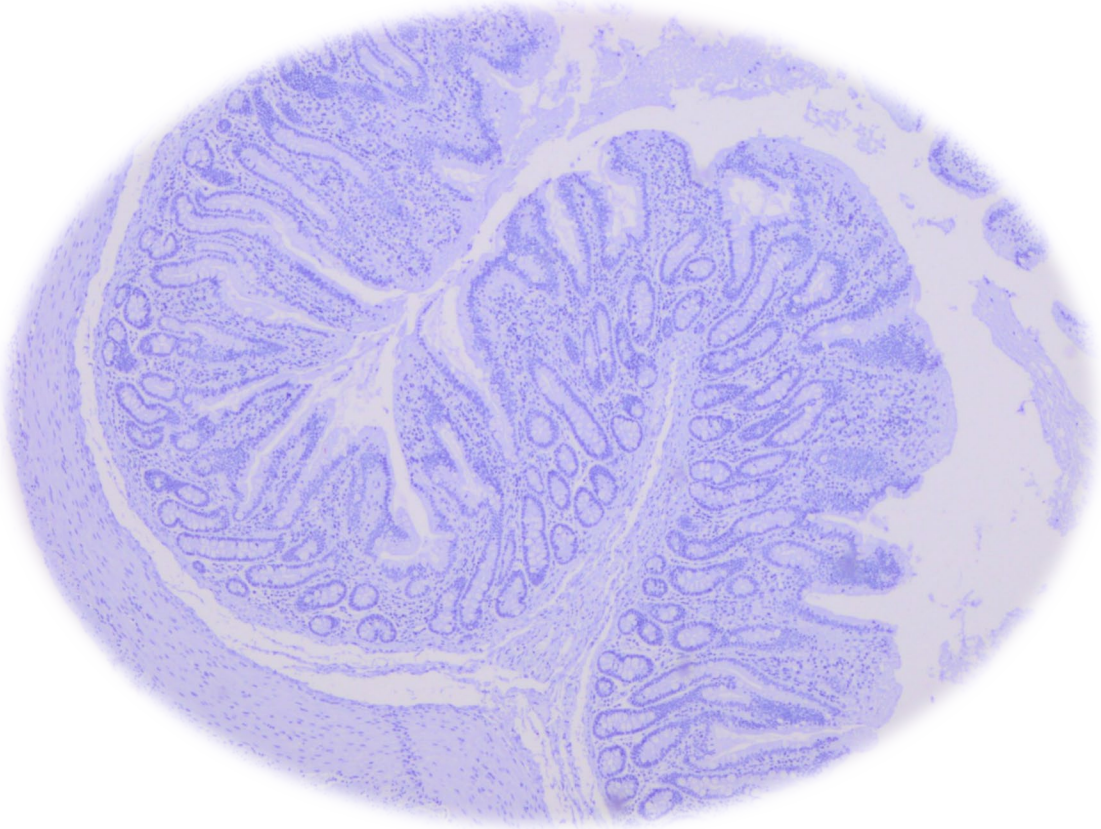
TGEV

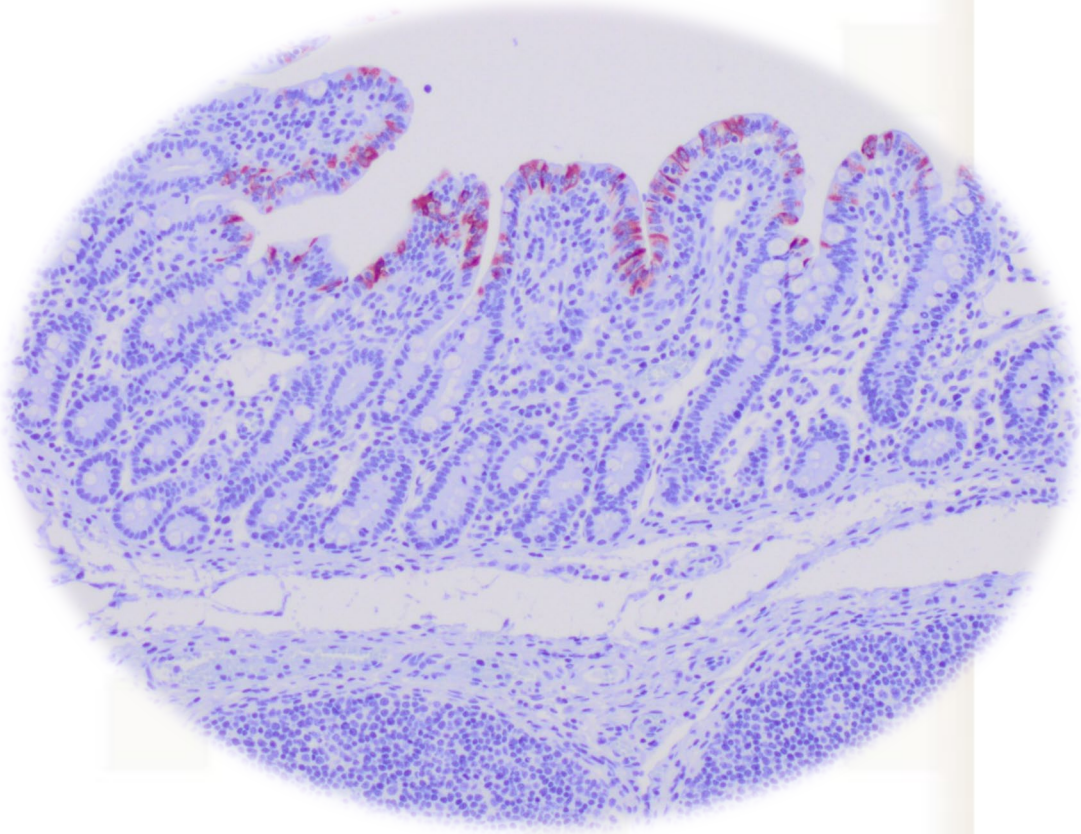
PEDV

PDCoV

SECoV

SADS





TGEV

PEDV

PDCoV

SECoV

SADS

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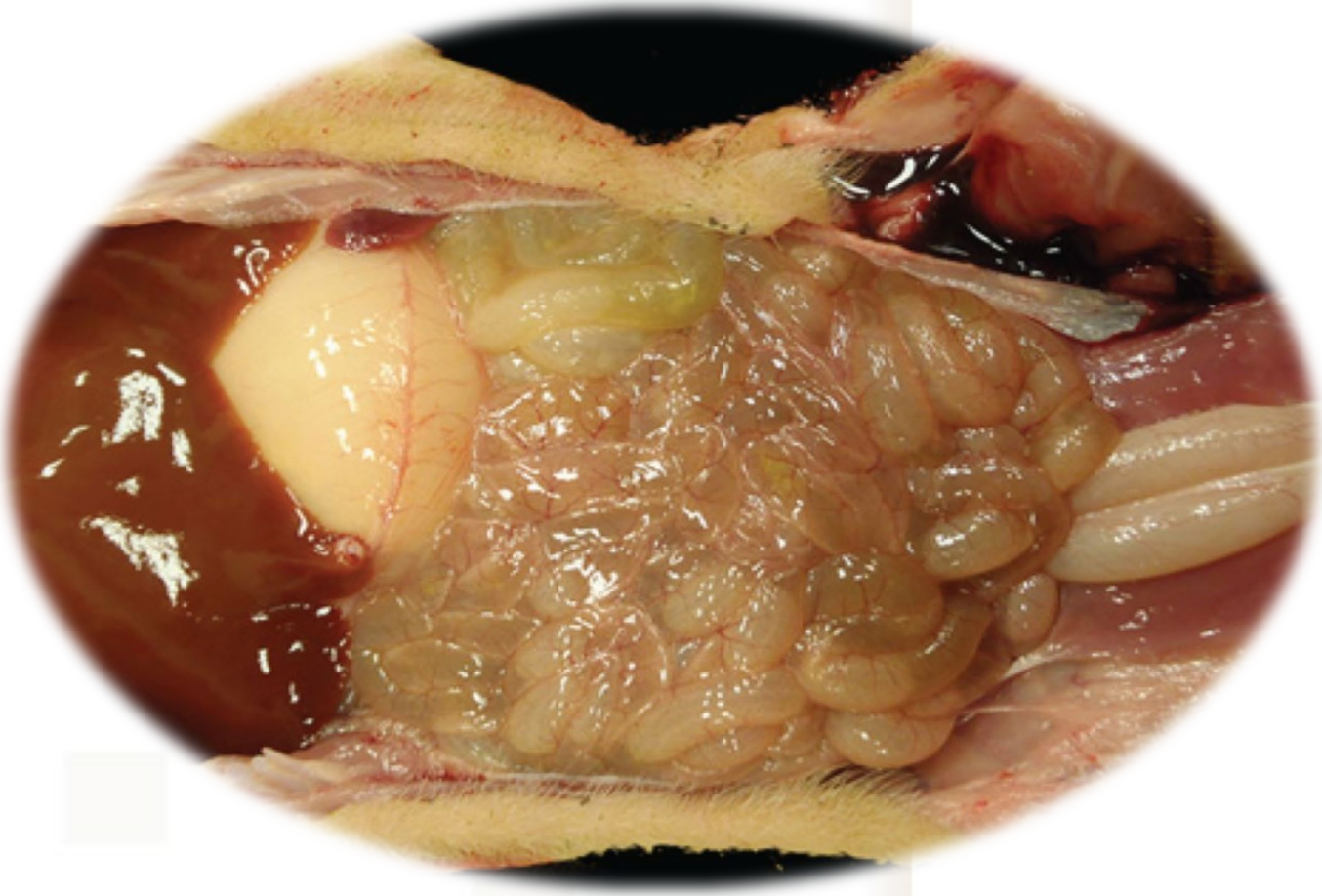

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Granja sin exposición previa

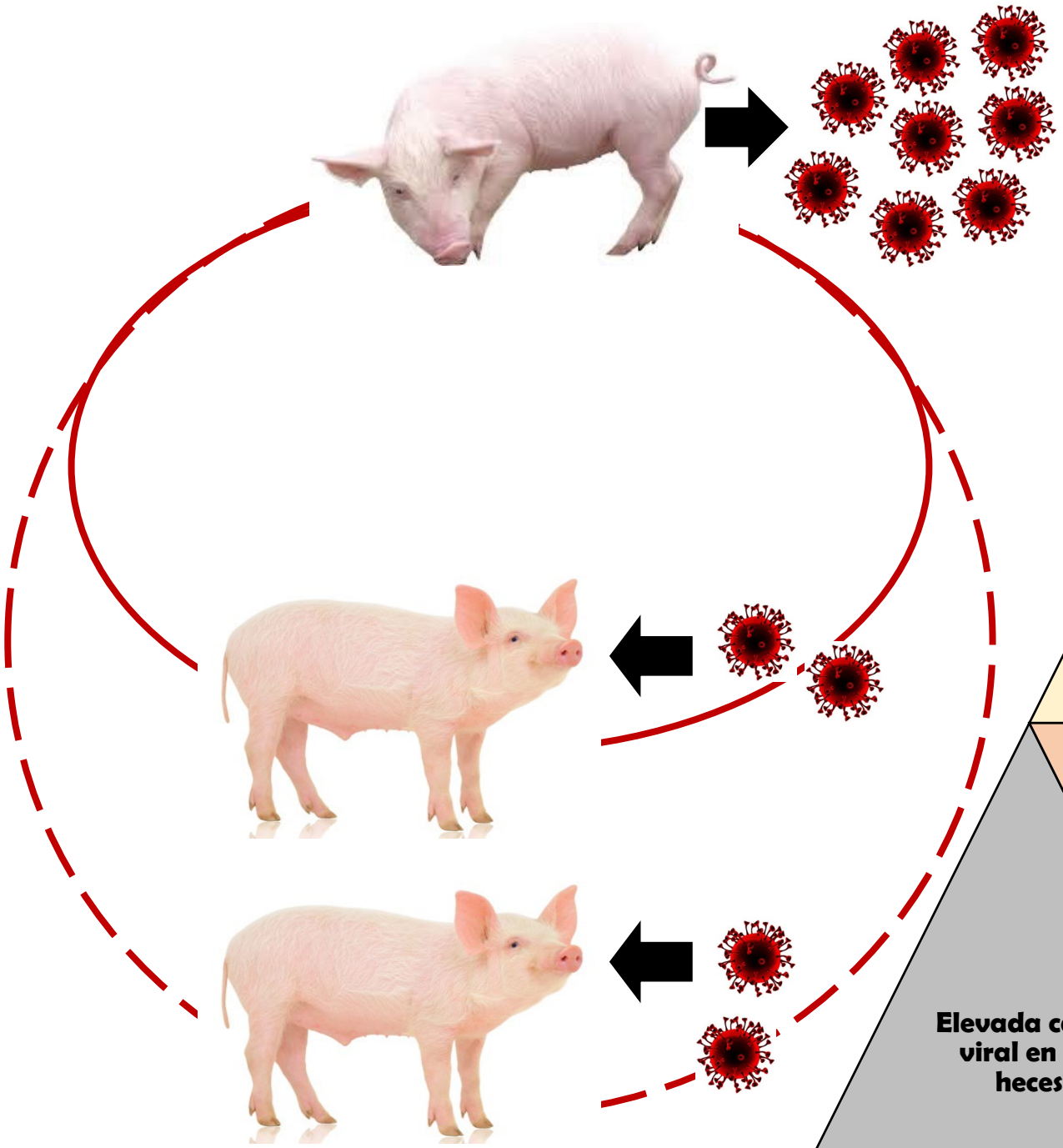
PRESENTACIÓN EPIDÉMICA

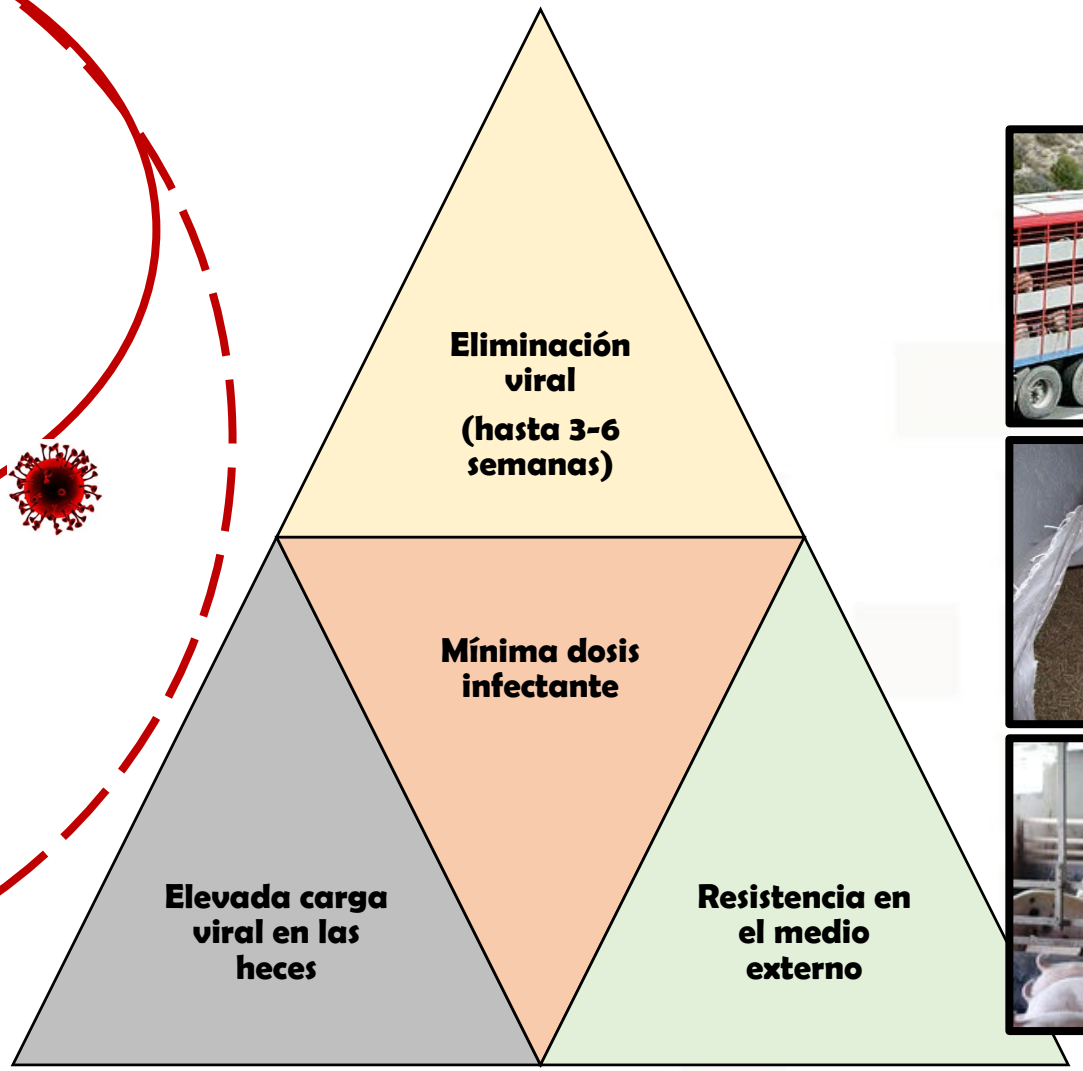
- Elevada morbilidad
- Cerdos de todas las edades
- Rápida difusión
- Mortalidad en lechones de menos de 1 semana (0-100 %)

Granja con infección

PRESENTACIÓN ENDÉMICA

- Morbilidad moderada
- Cerdos tras el destete y animales de reposición
- Sin mortalidad




Eliminación viral
(hasta 3-6 semanas)
Mínima dosis infectante
Elevada carga viral en las heces
Resistencia en el medio externo

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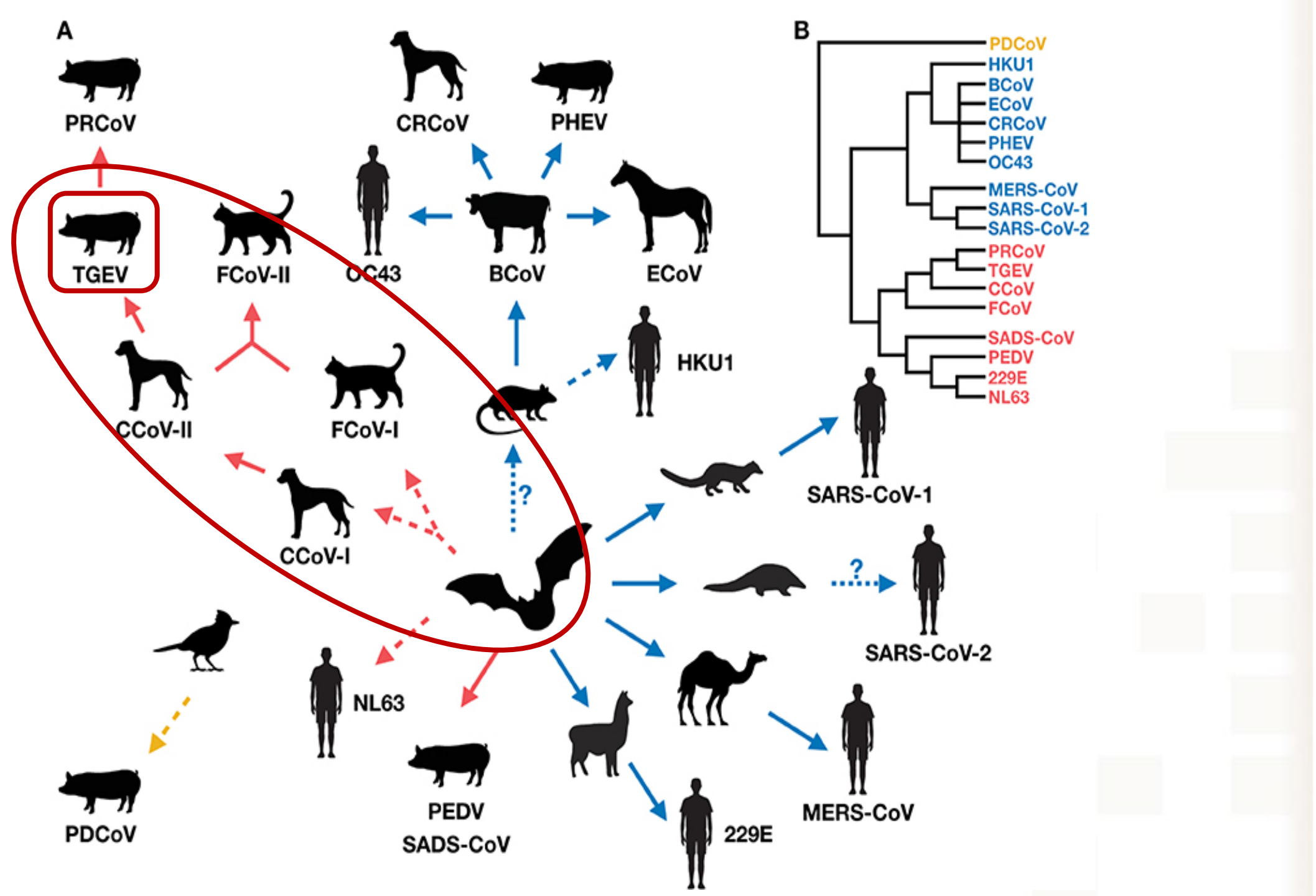
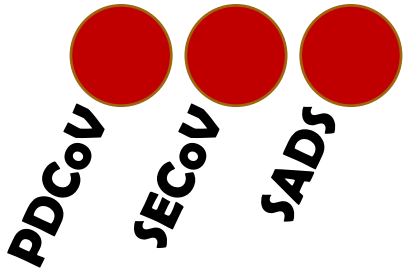
Doyle & Hutchings, 1946

- **Primera descripción en EE.UU.**
- **Desde entonces se describe en prácticamente todos los países con producción porcina importante.**


A
PRCoV
CRCoV
PHEV
TGEV
FCoV-II
OC43
BCoV
ECoV
CCoV-II
FCoV-I
HKU1
CCoV-I
?
SARS-CoV-1
?
SARS-CoV-2
NL63
PEDV
SADS-CoV
229E
MERS-CoV
PDCoV
B
PDCoV
HKU1
BCoV
ECoV
CRCoV
PHEV
OC43
MERS-CoV
SARS-CoV-1
SARS-CoV-2
PRCoV
TGEV
CCoV
FCoV
SADS-CoV
PEDV
229E
NL63



Doyle & Hutchings, 1946

- Primera descripción en EE.UU.
- Desde entonces se describe en prácticamente todos los países con producción porcina importante.

1984

- En Bélgica se describe una elevada prevalencia de animales seropositivos al TGEV en ausencia de signos clínicos de diarrea. Aparición de un nuevo virus relacionado antigénicamente con el TGEV.
- **Coronavirus Respiratorio Porcino (PRCV)**: tropismo respiratorio, rápida difusión y protección frente a la infección por el TGEV.

TGEV

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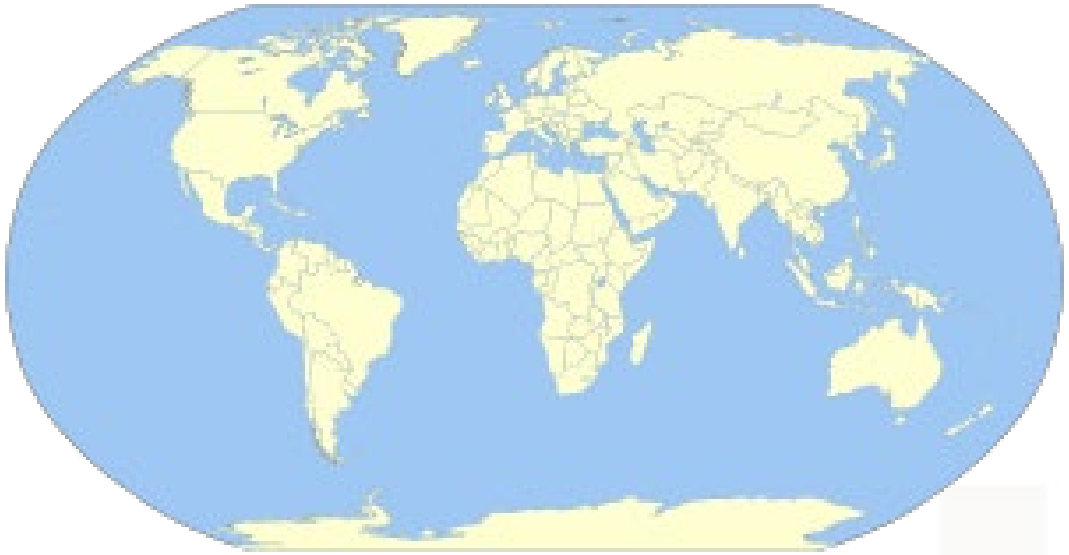
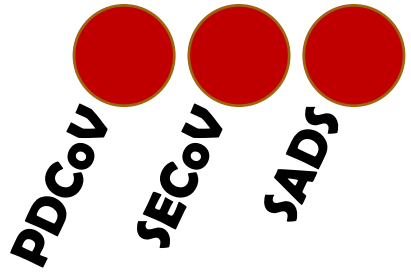


- ✓ **Enfermedad de distribución mundial.**
- ✓ **Presentación esporádica en todas las regiones donde está presente el PRCV.**
- ✓ **Enfermedad incluida en listas de la OIE.**



UK, 1971

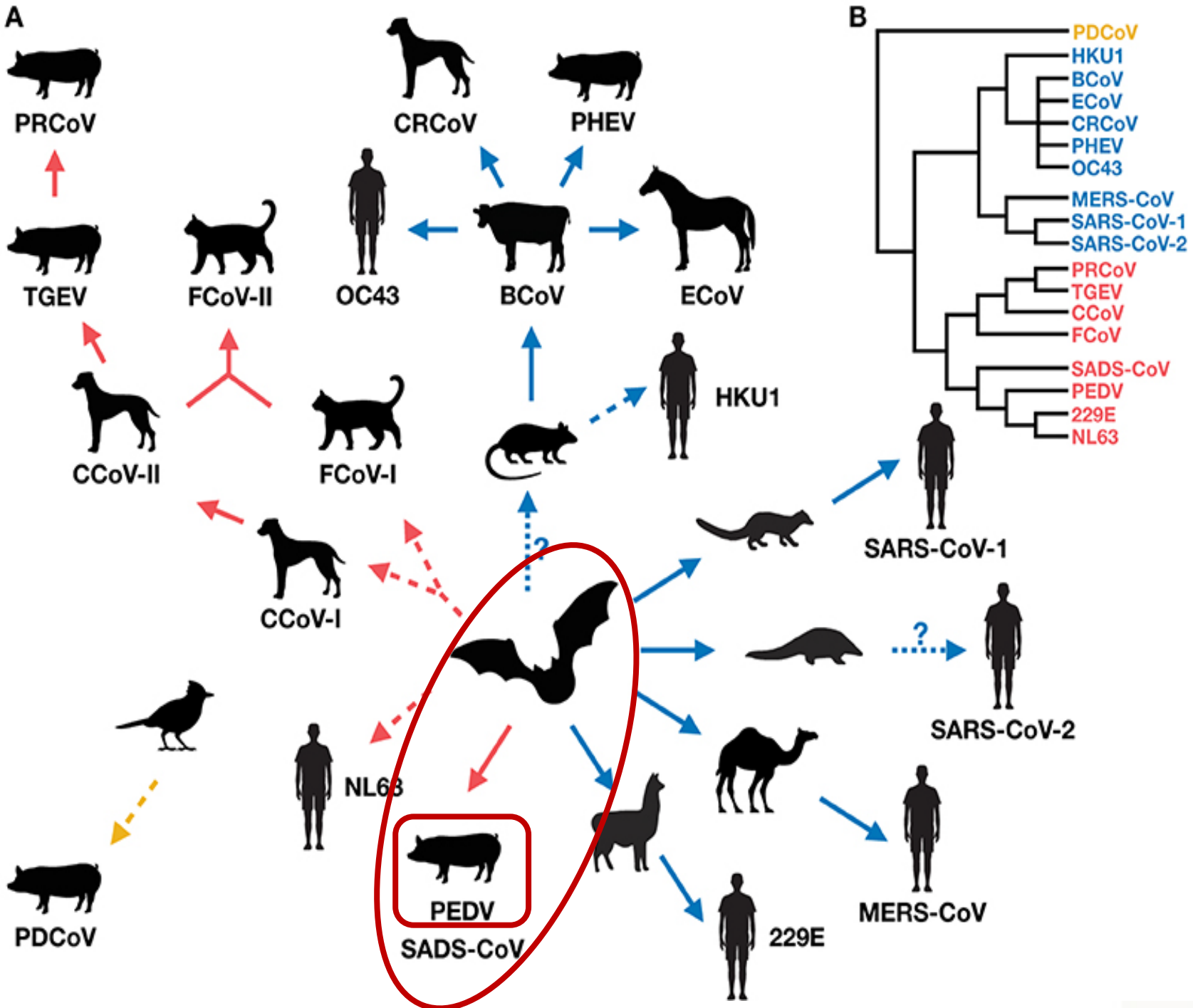
- Brotes agudos de diarrea (TGE-*like* TGEV-neg) que no afectan a lactantes.
- Se extiende por Europa y se denomina Diarrea Epidémica Viral.

UK, 1976

- Brotes agudos de diarrea (TGE-*like* TGEV-neg) que afectan a cerdos de todas las edades.
- Se extiende por Europa y se denomina de Diarrea Epidémica Viral tipo 2.

1978

- Se identifica un nuevo coronavirus como agente etiológico.
- Al proceso se le identifica como PED y a este agente etiológico como PEDV.


A
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SARS-CoV-1
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PEDV
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PDCoV
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SARS-CoV-1
SARS-CoV-2
PRCoV
TGEV
CCoV
FCoV
SADS-CoV
PEDV
229E
NL63

VetRecord

Paper & Article | Full Access

Epidemic of diarrhoea caused by porcine epidemic diarrhoea virus in Italy

P. Martelli DVM, A. Lavazza DVM, A. D. Nigrelli DVM, G. Merialdi DVM, L. G. Alborali DVM, M. B. Pensaert DVM, PhD

First published: 08 March 2008 | https://doi.org/10.1136/.307 | Citations: 8

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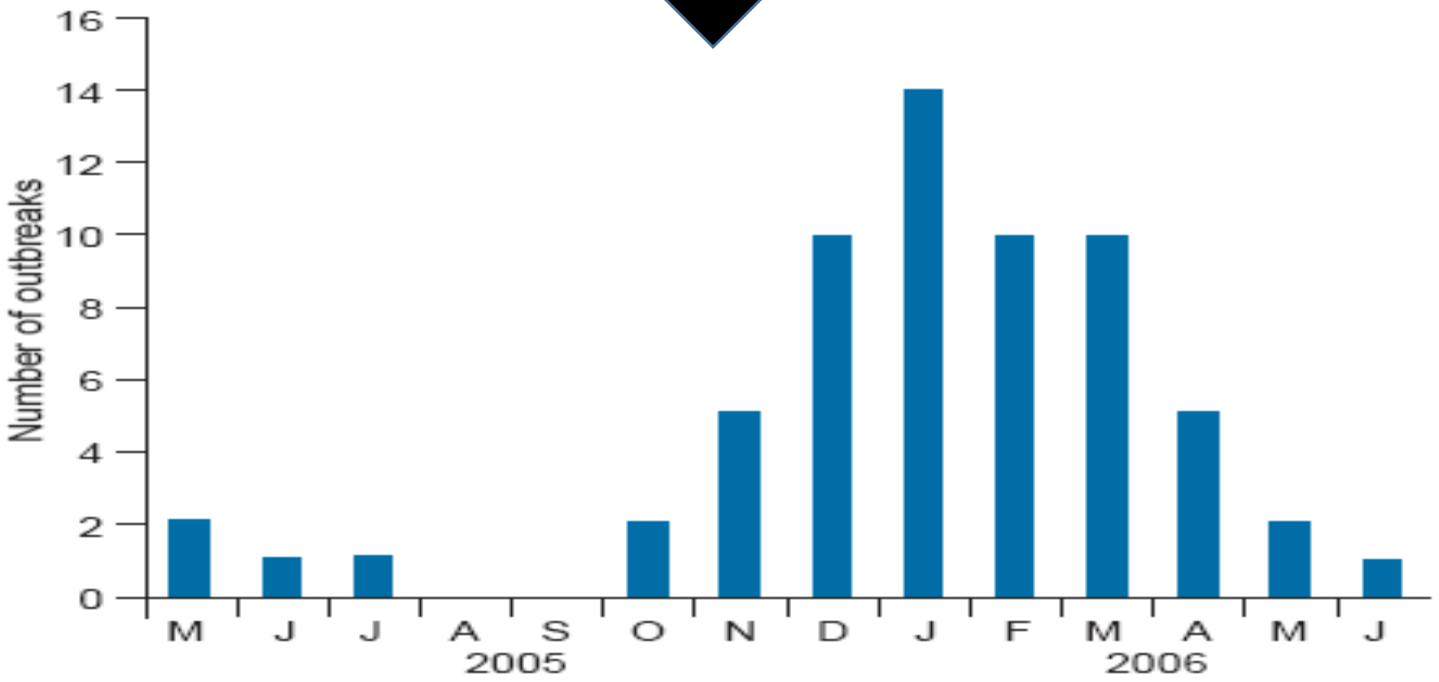

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- ✓ **Primeras descripciones en 1983 en China y Japón. El virus difunde a los principales países productores de la región (Corea, Tailandia, Filipinas…).**
- ✓ **Importante causa de brotes de diarrhea durante los últimos 40 años.**
- ✓ **A partir del año 2010, los brotes de PED en Asia se asocian a elevada morbilidad y mortalidad en lechones.**

TGEV

PEDV

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SECoV

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- ✓ **Abril, 2013, Ohio (USA).**
- ✓ **Difusión MUY MUY MUY RÁPIDA por todo el país así como hacia otros países del norte, centro y sur del continente.**
- ✓ **Alta mortalidad en los lechones lactantes y pérdidas económicas muy importantes en las granjas afectadas.**

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2013	Ohio	Brotes de diarrea en la mitad del mes de abril. Confirmado PEDV en mayo de 2013.
9 semanas	EEUU	218 granjas confirmadas en 16 estados.
Final año 2013	EEUU	2.692 granjas confirmadas en 23 estados.

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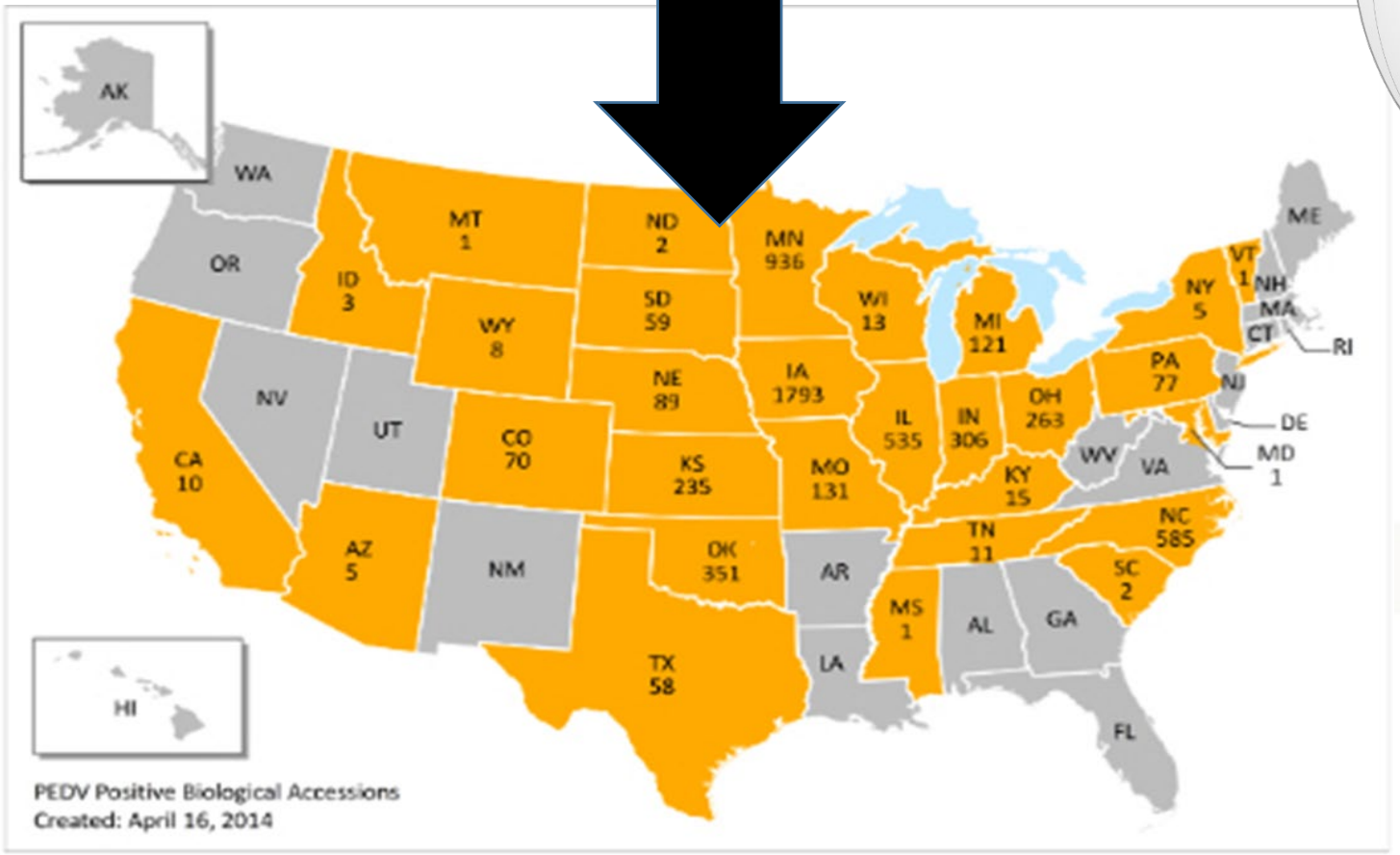

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Abril, 2013	EEUU
Julio, 2013	México
Octubre, 2013	Perú
Noviembre, 2013	República Dominicana
Enero, 2014	Canadá
Marzo, 2014	Colombia
Julio, 2014	Ecuador

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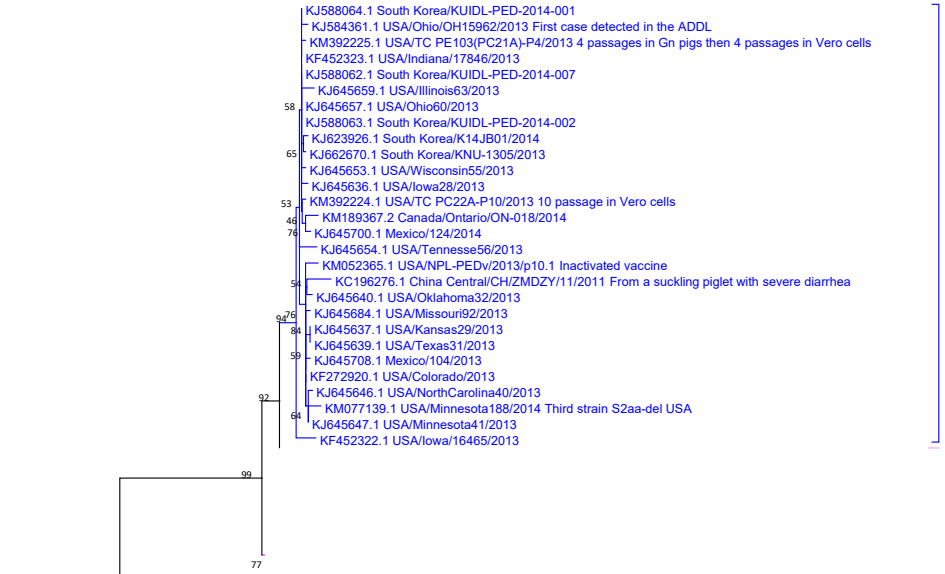

G2b o NON-INDEL EEUU

G1b o INDEL EEUU

- ✓ **Diferente virulencia**
- ✓ **Diferente transmisibilidad**

G2b o NON-INDEL EEUU

G2a o NON-INDEL ASIA (post. 2010)

G1b o INDEL EEUU

G1a o INDEL ASIA-EUROPA

TGEV

PEDV

PDCoV

SECoV

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Lee *Virology Journal* (2015) 12:193
DOI 10.1186/s12985-015-0421-2

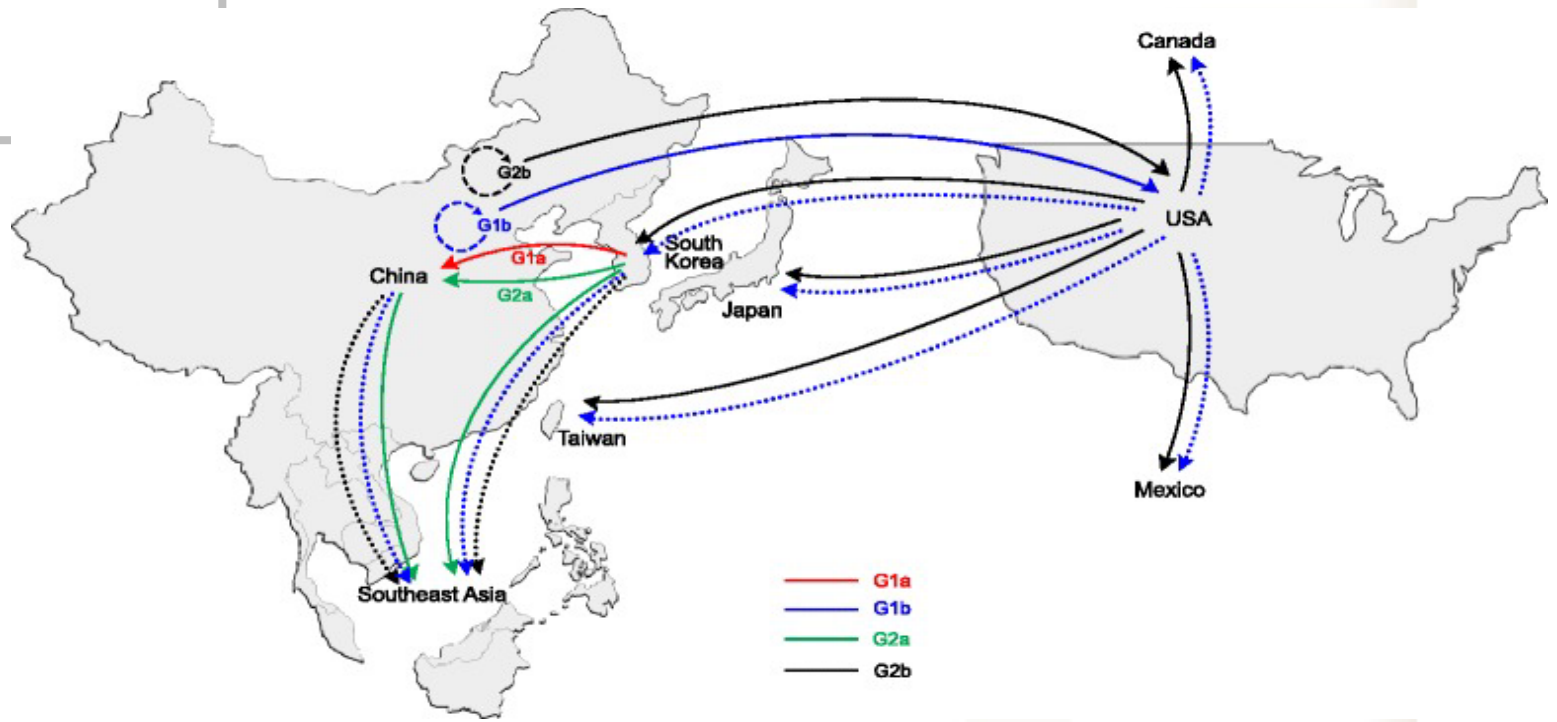
VIROLOGY JOURNAL

REVIEW Open Access

Porcine epidemic diarrhea virus: An emerging and re-emerging epizootic swine virus

Changhee Lee

Federal agriculture authorities reported that woven bulk bags were the most likely vehicles for spread of the porcine epidemic diarrhea virus to U.S. farms.



TGEV

PEDV

PDCoV

SECoV

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Stadler et al. BMC Veterinary Research (2015) 11:142
DOI 10.1186/s12917-015-0454-1

BMC Veterinary Research

CASE REPORT Open Access

Emergence of porcine epidemic diarrhea virus in southern Germany

Julia Stadler[1*], Susanne Zoels[1], Robert Fux[2], Dennis Hanke[3], Anne Pohlmann[3], Sandra Blome[3], Herbert Weissenböck[4], Christiane Weissenbacher-Lang[4], Mathias Ritzmann[1] and Andrea Ladinig[5]

genomeA
Journals.ASM.org

Complete Genome Sequence of a Porcine Epidemic Diarrhea Virus from a Novel Outbreak in Belgium, January 2015

Sebastiaan Theuns,[a] Nádia Conceição-Neto,[b] Isaura Christiaens,[a] Mark Zeller,[b] Lowiese M. B. Desmarets,[a] Inge D. M. Roukaerts,[a] Delphine D. Acar,[a] Elisabeth Heylen,[b] Jelle Matthijnssens,[b] Hans J. Nauwynck[a]

Ghent University, Faculty of Veterinary Medicine, Department of Virology, Parasitology and Immunology, Laboratory of Virology, Merelbeke, Belgium[a]; KU Leuven–University of Leuven, Department of Microbiology and Immunology, Laboratory for Clinical and Epidemiological Virology, Rega Institute for Medical Research, Leuven, Belgium[b]

S.T., N.C.-N., and I.C. contributed equally to this work.

J.M. and H.J.N. share senior authorship.

news Jan 8, 2015

Mild strain of PEDv found in farms West Europe

HEALTH / DISEASES 1005 0

Various finisher farms in Germany and the Netherlands have reported a mild strain of Porcine Epidemic Diarrhoea virus (PEDv) since late last year. The type is not as aggressive as the variant in Northern America and Asia.

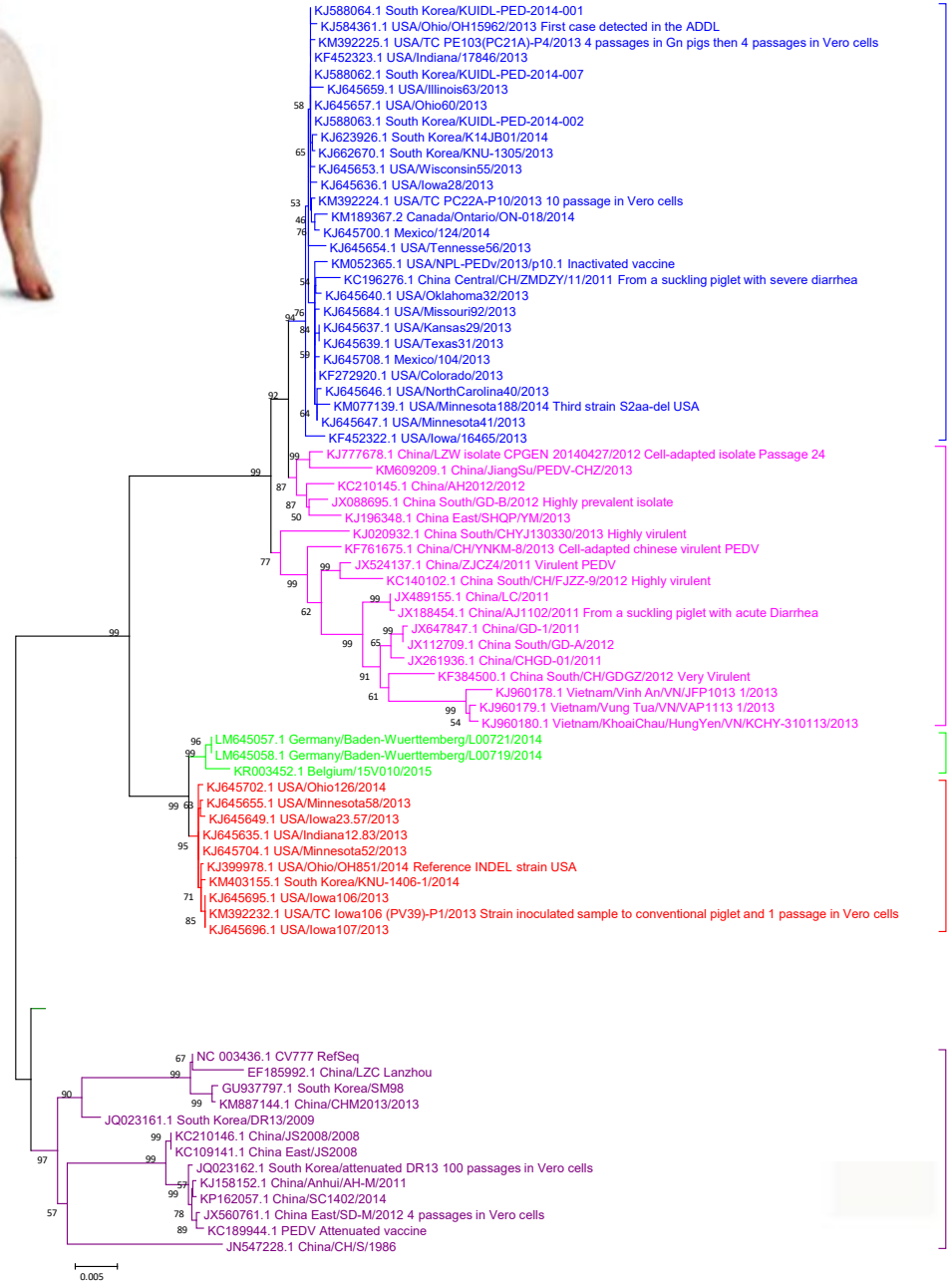
Dutch agricultural magazine and newspaper *Boerderij* writes that the **mild strain of PEDv** usually causes diarrhoea among finishers – the animals are observed to overcome the problems by themselves. There is no report of any mortality, although this might change if the virus would also be found in breeding farms.

ELSEVIER

Veterinary Microbiology
Volume 226, November 2018, Pages 9-14

Lessons learnt from a porcine epidemic diarrhea (PED) case in France in 2014: Descriptive epidemiology and control measures implemented

Sarah Gallien [a, b], Christelle Fablet [a, b], Lionel Bigault [a, b], Cécilia Bernard [a, b], Olivier Toulouse [c], Mustapha Berri [d], Yannick Blanchard [a, b], Nicolas Rose [a, b], Béatrice Grasland [a, b]



G2b o NON-INDEL EEUU

G2a o NON-INDEL ASIA (post. 2010)

INDEL GERMANY-BELGIUM

G1b o INDEL EEUU

G1a o INDEL ASIA-EUROPA

TGEV

PEDV

PDCoV

SECoV

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EMERGING INFECTIOUS DISEASES

Emerg Infect Dis. 2015 Dec; 21(12): 2235–2237.

doi: 10.3201/eid2112.150272

Porcine Epidemic Diarrhea Virus among Farmed Pigs, Ukraine

Akbar Dastjerdi,✉ John Carr, Richard J. Ellis, Falko Steinbach, and Susanna Williamson

TGEV

PEDV

PDCoV

SECoV

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2012	• **Primera descripción en Asia (Hong Kong).**
2014	• **Detección en EE.UU. en brotes de diarrea en cerdos, con mortalidad en lechones, tanto solo como en coinfecciones con el PEDV.**
Distribución	• **Detectado en EE.UU., Canadá, México y Perú en el continente americano y en China, Corea del sur, Tailandia o Vietnam en Asia.** • **Los estudios retrospectivos indican que este virus circula en EE.UU. desde 2010 y en China desde 2004.**

TGEV

PEDV

PDCoV

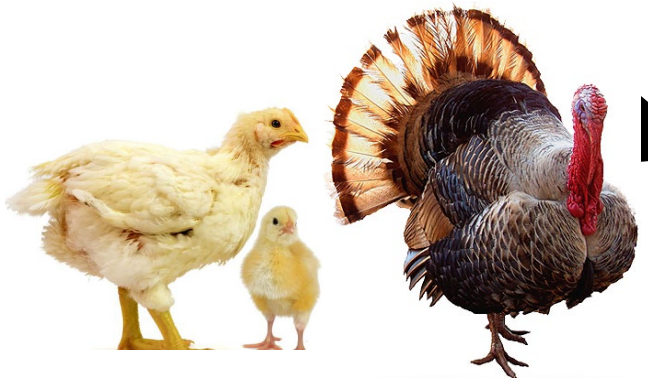
SECoV

SADS

Origen

Hospedador

- Recombinación entre dos CoVs de aves.



TGEV

PEDV

PDCoV

SECoV

SADS

TGEV

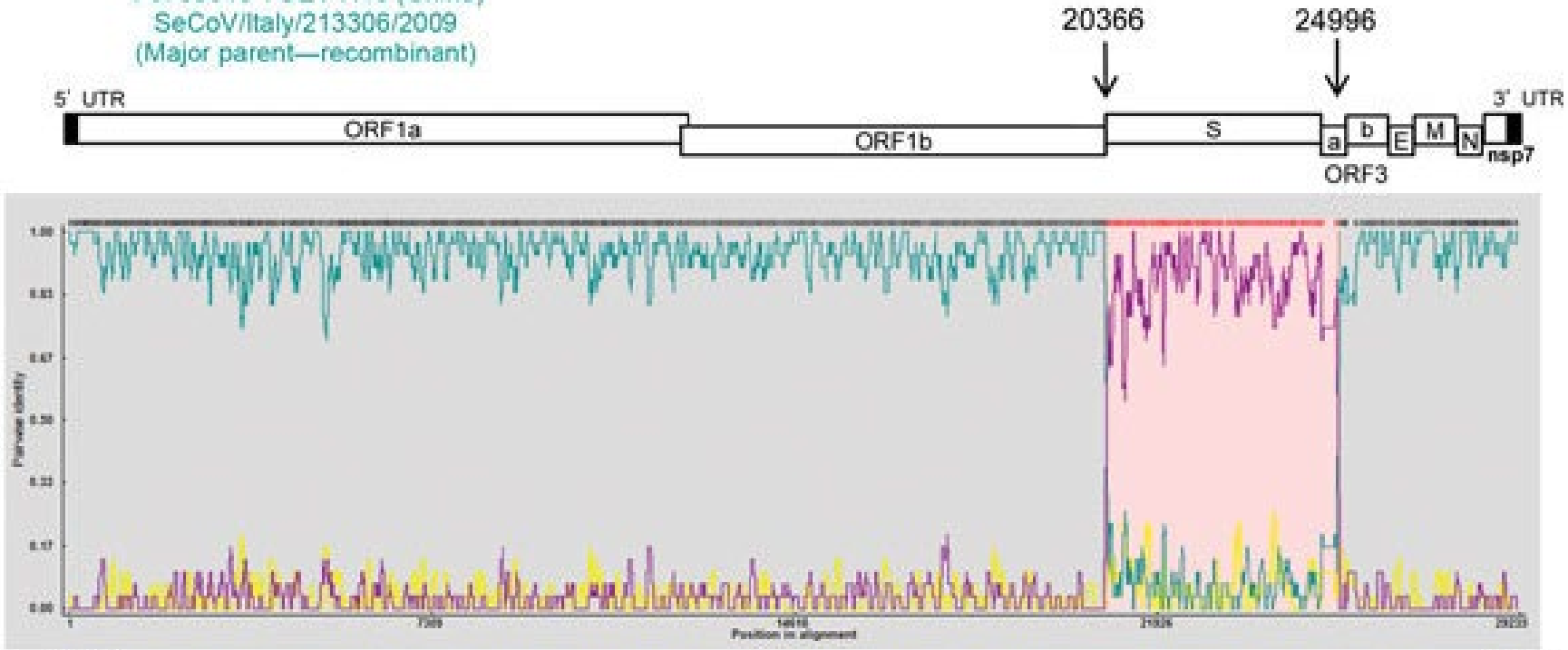
PEDV

PDCoV

SECoV

SADS

FJ755618 TGEV H16 (China)
SeCoV/Italy/213306/2009
(Major parent—recombinant)



AF353511 PEDV CV777 (Belgium)
SeCoV/Italy/213306/2009
(Minor parent—recombinant)

20636

24867

TGEV

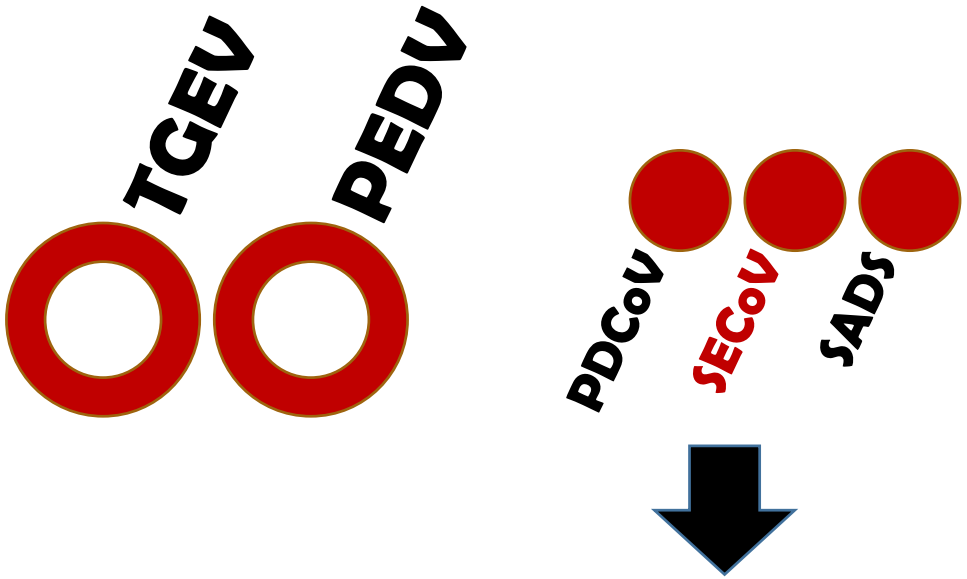
PEDV

PDCoV

SECoV

SADS

Italia, 2009	• Boniotti *et al.*, 2016
Alemania, 2012	• Akimkim *et al.*, 2016
Eslovenia, 2016	• Belsham *et al.*, 2016
Eslovaquia, 2015	• Mandelik *et al.*, 2018
Italia, 2019	• Pappeti *et al.*, 2022
España, 1993-2014	• De Nova *et al.*, 2020



universidad de león

ORIGINAL ARTICLE

Transboundary and Emerging Diseases WILEY

A retrospective study of porcine epidemic diarrhoea virus (PEDV) reveals the presence of swine enteric coronavirus (SeCoV) since 1993 and the recent introduction of a recombinant PEDV-SeCoV in Spain

Pedro J. G. de Nova[1] | Martí Cortey[2] | Ivan Díaz[3] | Héctor Puente[1] | Pedro Rubio[1] | Marga Martín[2,3] | Ana Carvajal[1]

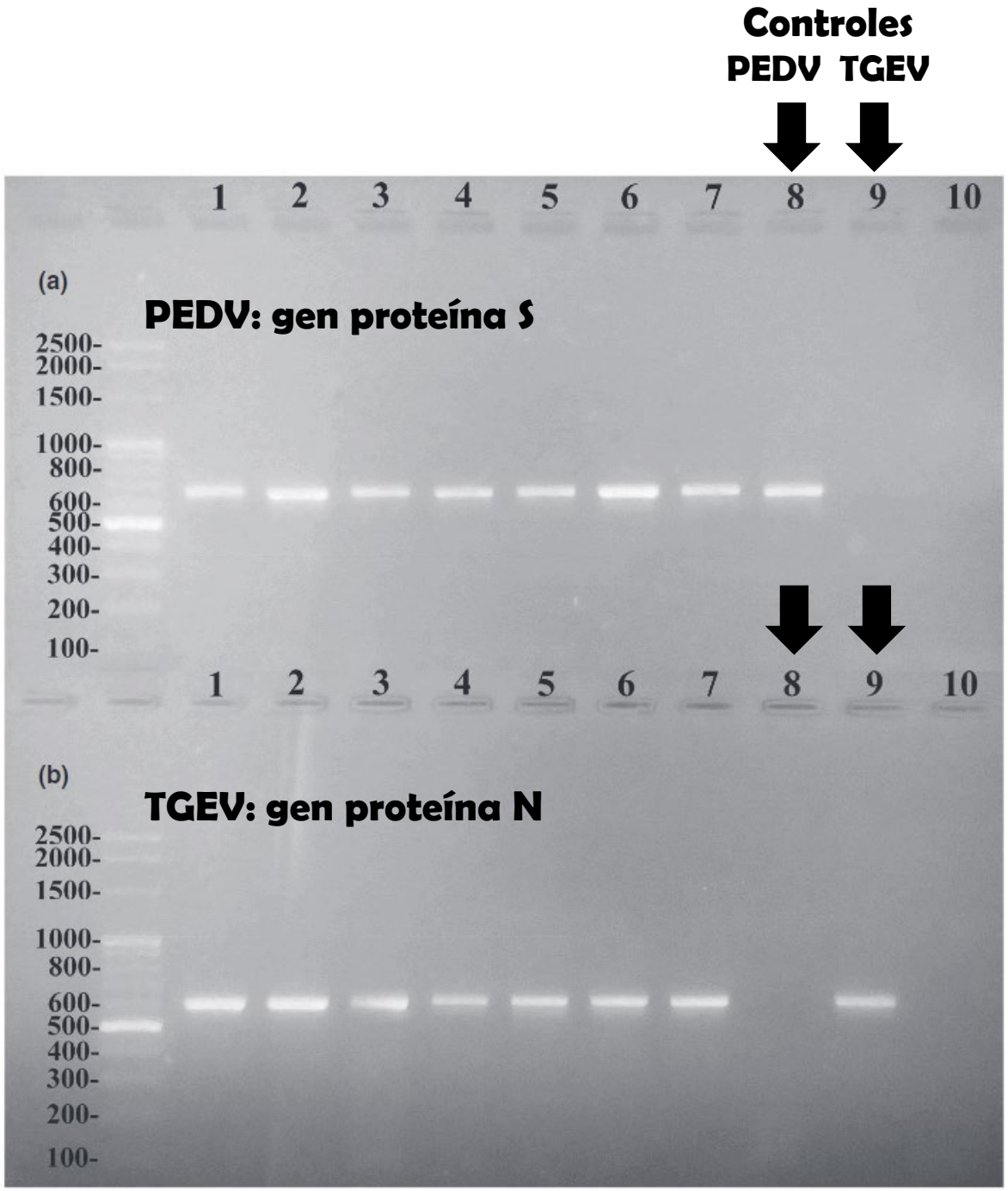


FIGURE 1 Identification of the swine enteric coronavirus (SeCoV) by the visualization under UV light of the RedSafe staining 2% agarose gel electrophoresis of the amplification of 651 bp of the porcine epidemic diarrhoea virus (PEDV) S-gene (a) and 612 bp of the transmissible gastroenteritis virus (TGEV) N-gene (b). Isolates of BU-1993 (1), EGV-1993 (2), SG1-1994 (3), VA-1994 (4), MU2-1998 (5), AYL-1999 (6), 1480-2014 (7), 1613-2015 as a positive control for PEDV (8), positive control for TGEV (9) and non-template control (10) are shown

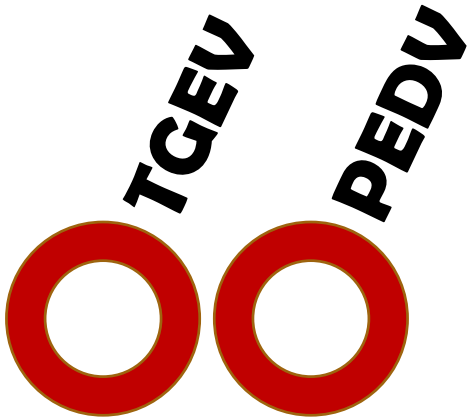
TGEV

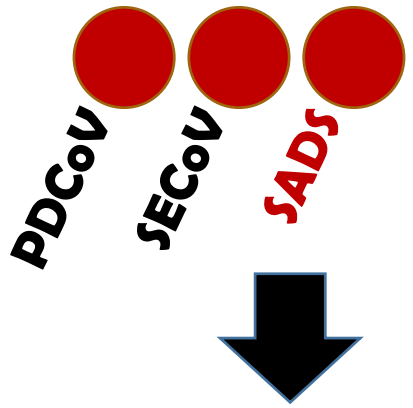
PEDV

PDCoV

SECoV

SADS





2016	• Primera descripción en China • Brotes de enfermedad entérica con elevada mortalidad en lechones.
Distribución	• Solo identificado en China por el momento.
Origen	• Muy similar a CoVs de murciélagos.
Hospedador	• Sólo se ha detectado en cerdos aunque preocupa el hecho de que es capaz de multiplicarse en células de origen humano en laboratorio.

TGEV

PEDV

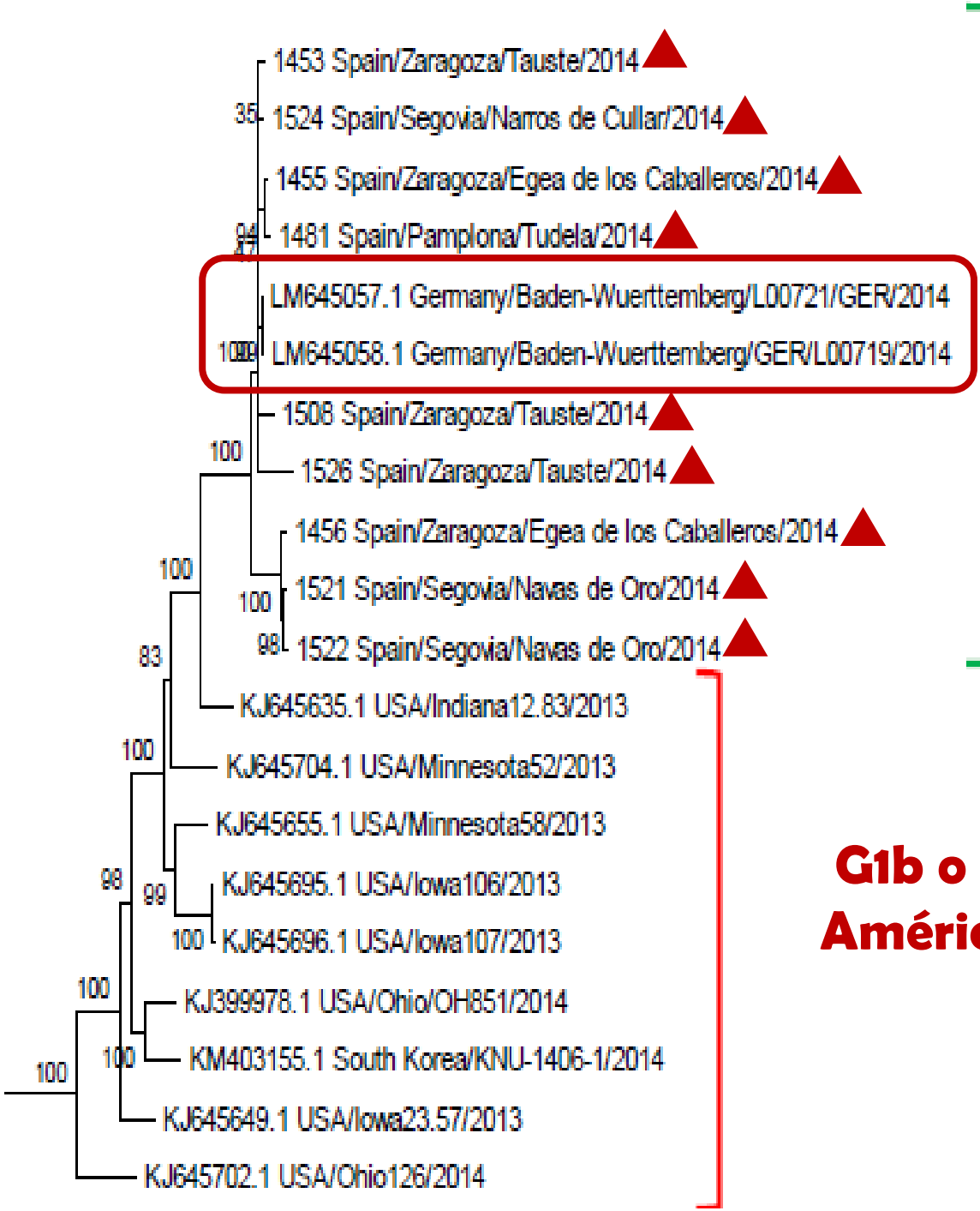
PDCoV

SECoV

SADS

?

universidad de león

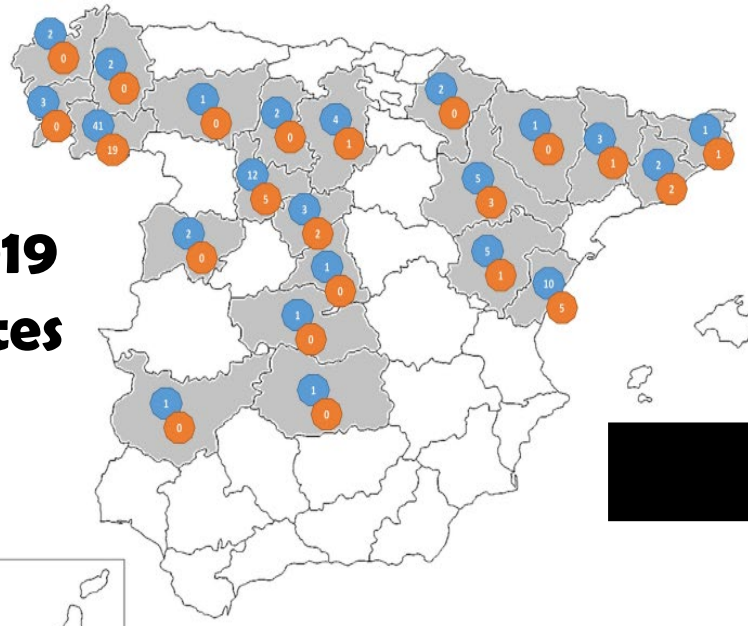


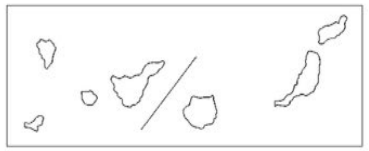
G1b o INDEL Europa

G1b o INDEL América-Asia

	Mortalidad			
	Media (%)	DE (%)	Mínimo (%)	Máximo (%)
Lechones de menos de 1 semana de edad	46,2	21,2	0	80
Lechones de más de 1 semana de edad	21,4	13,6	0	40
Destetados	5,8	3,3	0	10
Cebo	-	-	-	-
Cerdas	-	-	-	-

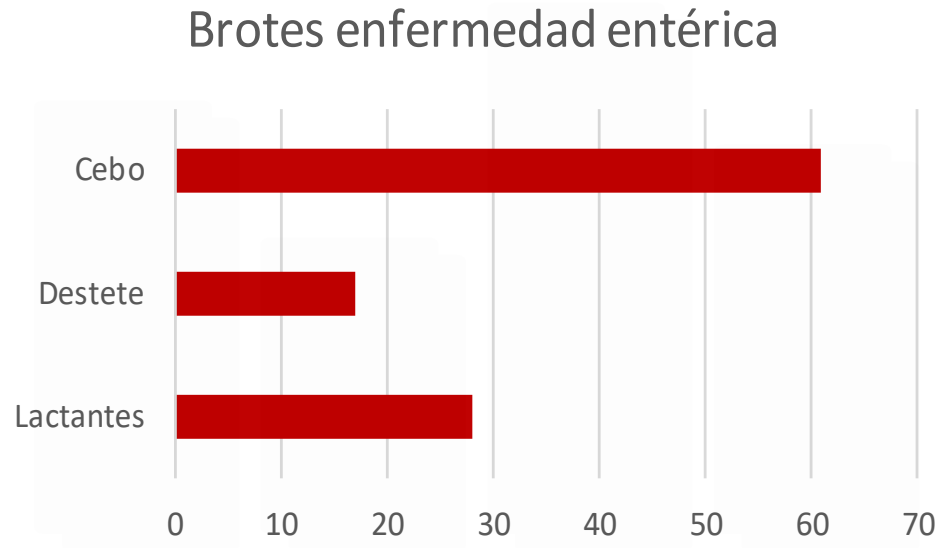
2017-2019
106 brotes

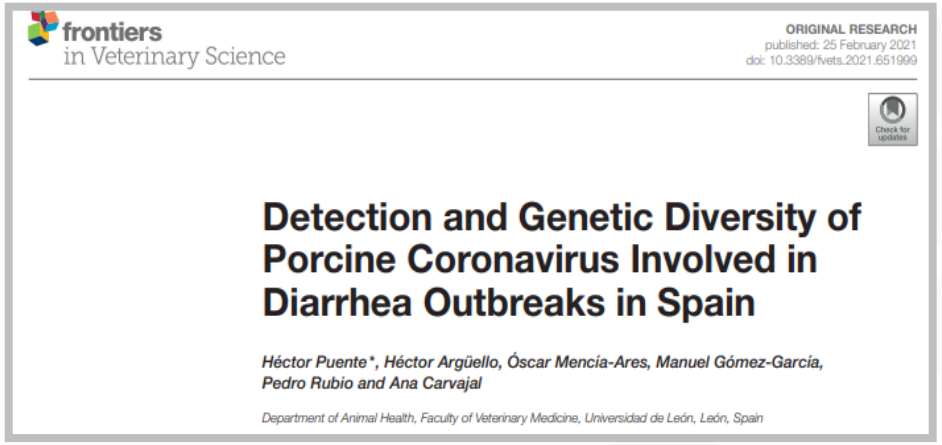




CoVs

- **PEDV**
- **TGEV**
- **SECoV**
- **PDCoV**
- **SADS**





frontiers in Veterinary Science

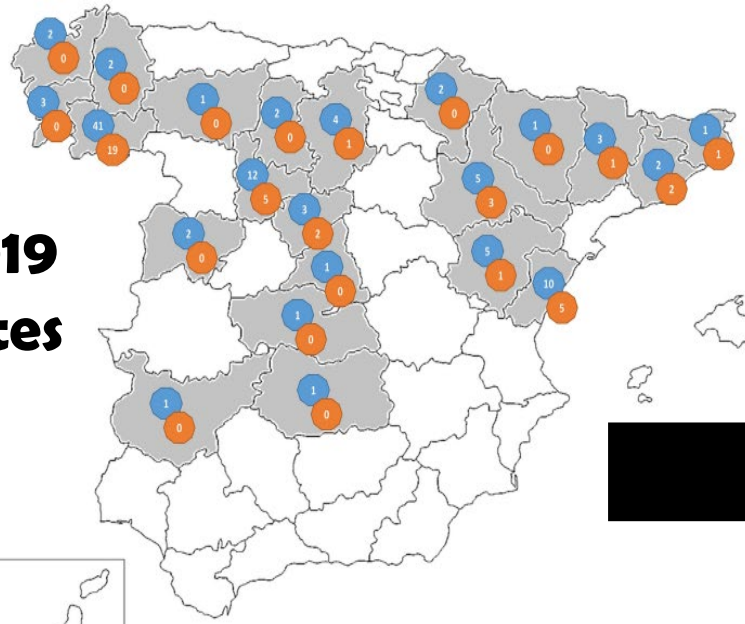
ORIGINAL RESEARCH
published: 25 February 2021
doi: 10.3389/fvets.2021.651999

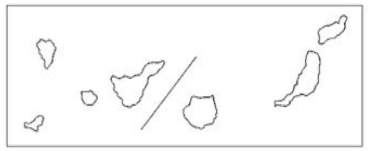
Detection and Genetic Diversity of Porcine Coronavirus Involved in Diarrhea Outbreaks in Spain

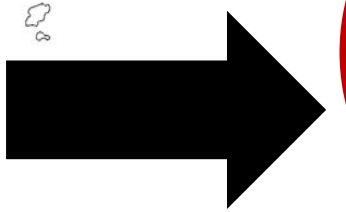
Héctor Puente, Héctor Argüello, Óscar Mencía-Ares, Manuel Gómez-García, Pedro Rubio and Ana Carvajal*

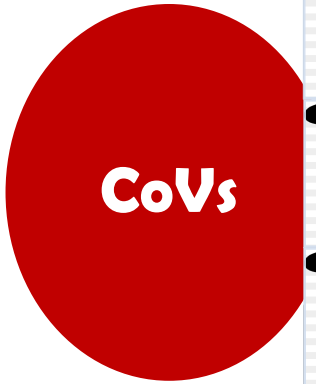
Department of Animal Health, Faculty of Veterinary Medicine, Universidad de León, León, Spain

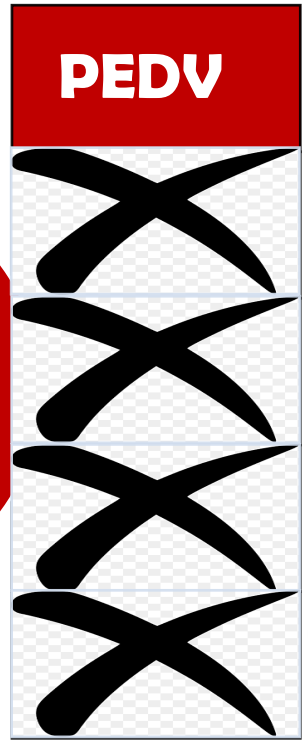
2017-2019
106 brotes

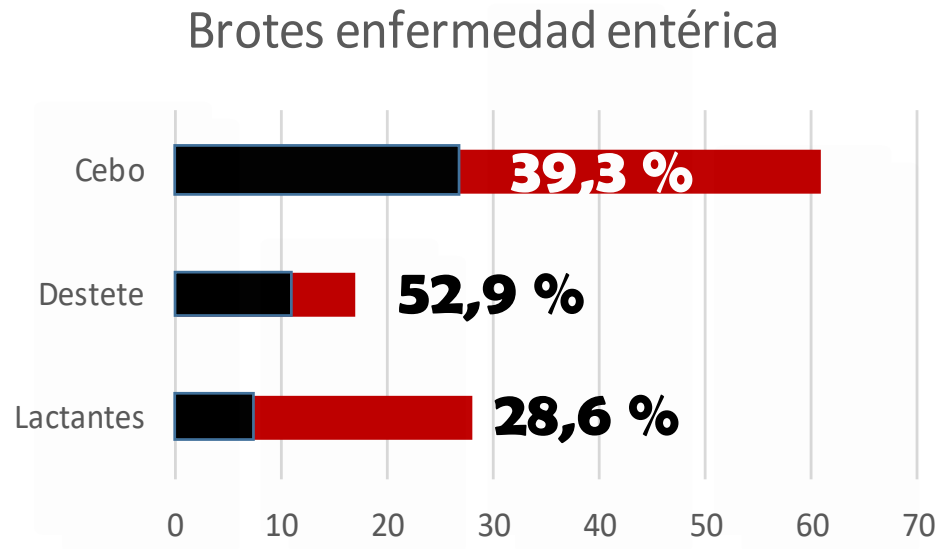












41/106 positivos a PEDV
38,7 %

INDEL 2.1

INDEL 2.2

INDEL 2.3

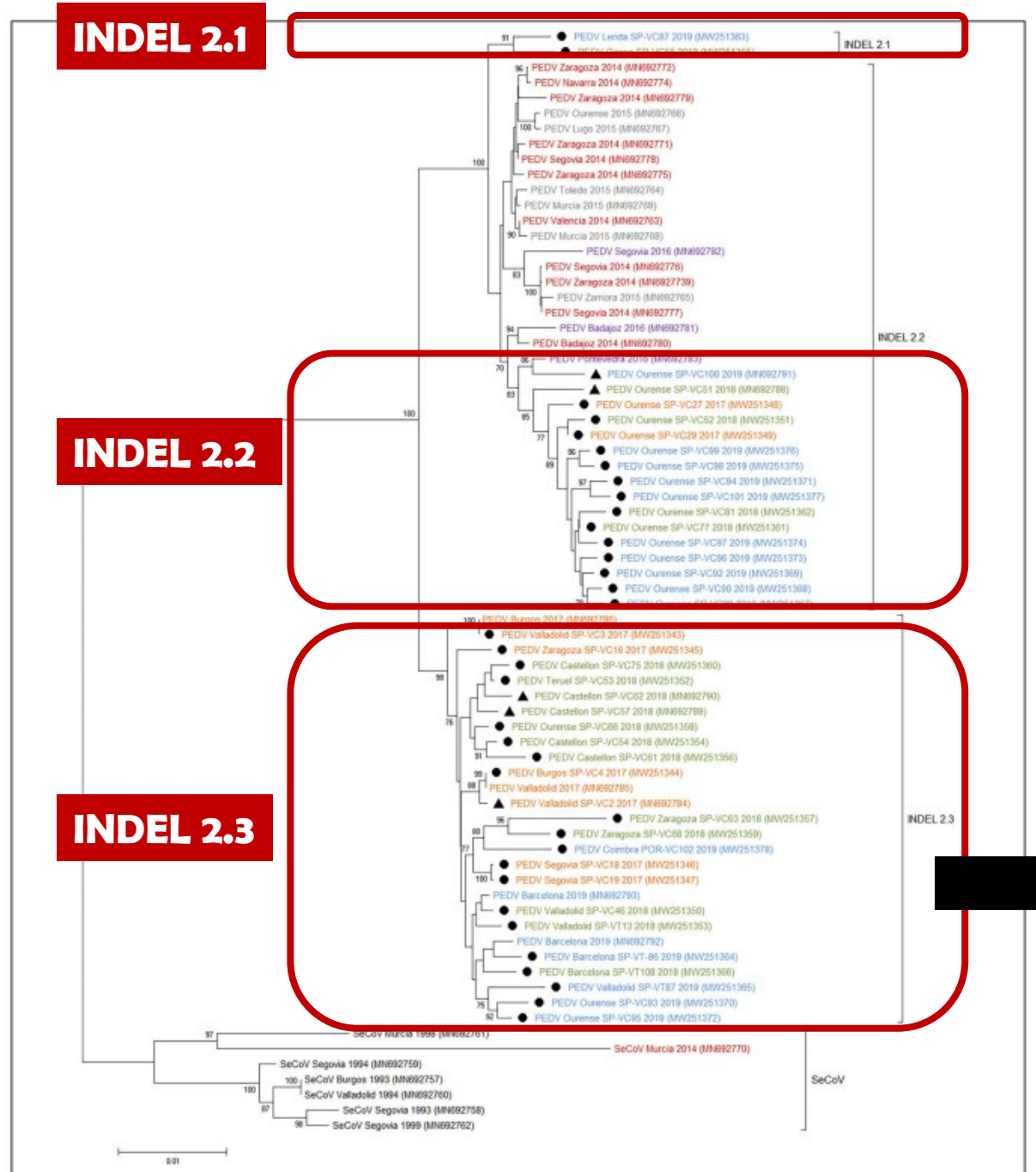


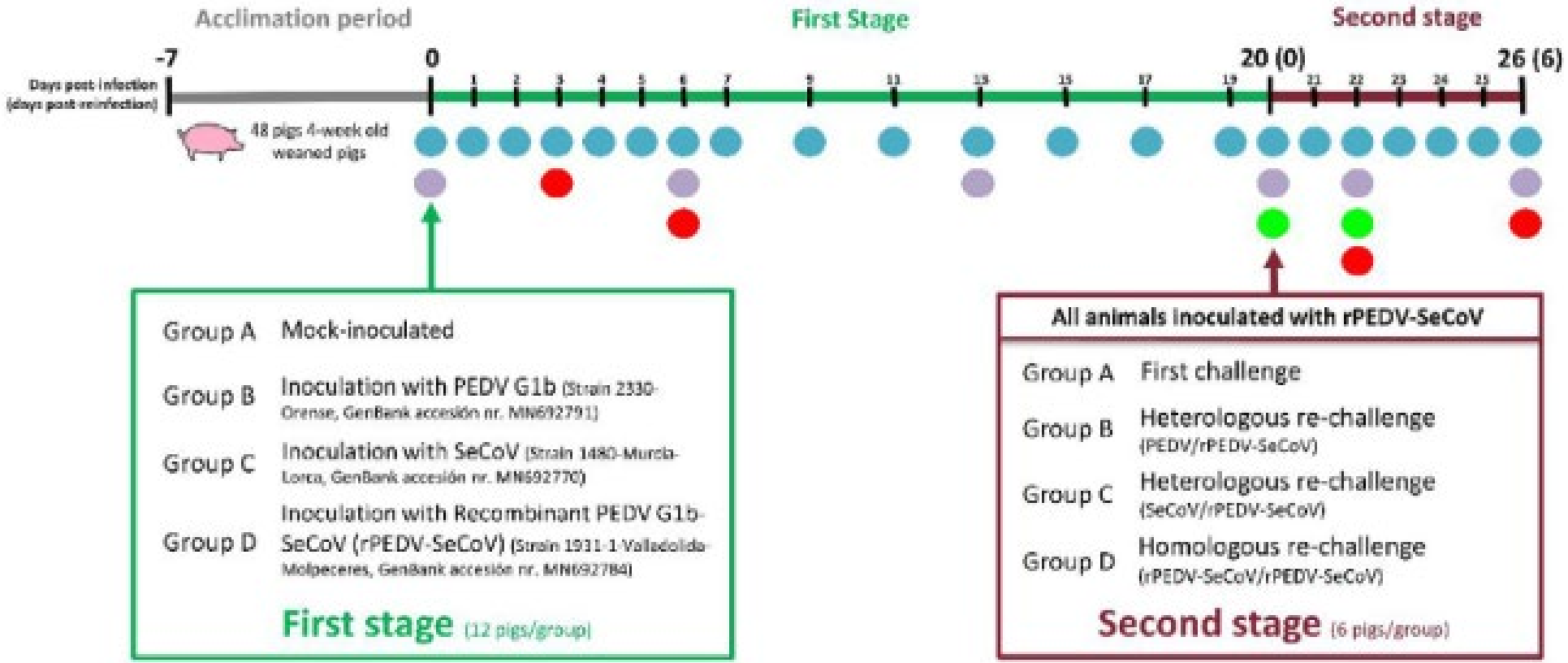
FIGURE 4 | Phylogenetic tree based on the complete S-gene sequences including all Spanish enteric porcine coronaviruses available in GenBank. Numbers along the tree represents the confidence value for a given internal branch based on 500 Bootstrap replicates (only values >70 are shown). The symbols above the strains

Recombinante PEDV-SECoV

Received: 19 May 2022 | Revised: 13 July 2022 | Accepted: 25 July 2022
DOI: 10.1111/tbed.14674
Transboundary and Emerging Diseases WILEY
ORIGINAL ARTICLE

Characterization and cross-protection of experimental infections with SeCoV and two PEDV variants

Héctor Puente[1] | Ivan Díaz[2] | Héctor Arguello[1,3] | Óscar Mencía-Ares[1] | Manuel Gómez-García[1] | Lucía Pérez-Pérez[1] | Clara Vega[1] | Martí Cortey[4] | Margarita Martín[4] | Pedro Rubio[1,3] | Ana Carvajal[1,3]



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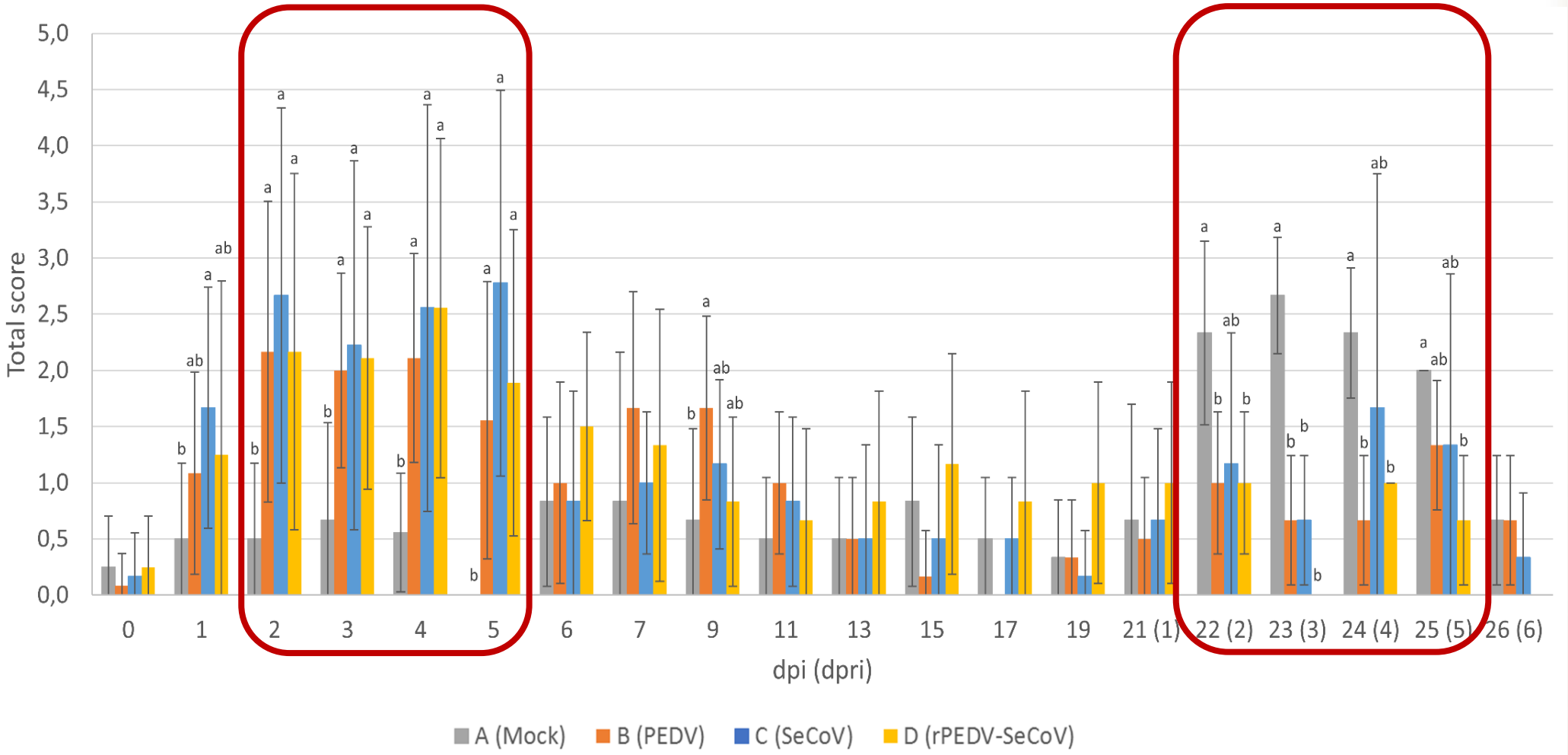

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- ✓ **Reinfección homóloga:**
  - ✓ **Protección completa en términos de cuadro clínico y lesiones.**
  - ✓ **Protección casi completa en términos de excreción.**
  - ✓ **Muy bajo o nulo potencial como transmisor.**
- ✓ **Reinfección heteróloga:**
  - ✓ **Protección moderada en términos de cuadro clínico y lesiones.**
  - ✓ **Protección limitada en términos de excrección.**
  - ✓ **Elevado potencial como transmisor.**

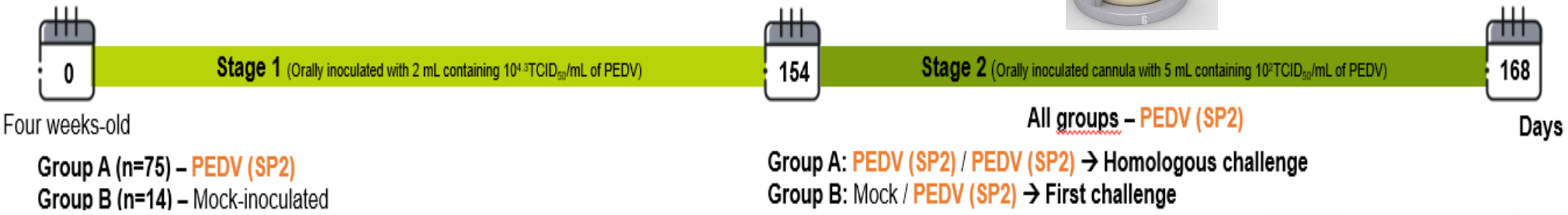
Received: 31 December 2020 | Revised: 2 February 2021 | Accepted: 2 March 2021
DOI: 10.1111/tbed.14055

ORIGINAL ARTICLE

Transboundary and Emerging Diseases WILEY

Immune response does not prevent homologous *Porcine epidemic diarrhoea* virus reinfection five months after the initial challenge

Ivan Díaz[1,2] | Joan Pujols[1,2] | Esmeralda Cano[1,2] | Martí Cortey[3] | Núria Navarro[1,2] | Anna Vidal[3] | Enric Mateu[1,2,3] | Marga Martín[1,2,3]



- ✓ **Reinfección homóloga:**
  - ✓ **Protección casi completa en términos de cuadro clínico y lesiones.**
  - ✓ **Protección limitada en términos de excreción.**
  - ✓ **Elevado potencial como transmisor.**

- Coronavirus
- **Rotavirus**
- Otros virus

Ana Carvajal Urueña

DIGESPORC

Universidad de León

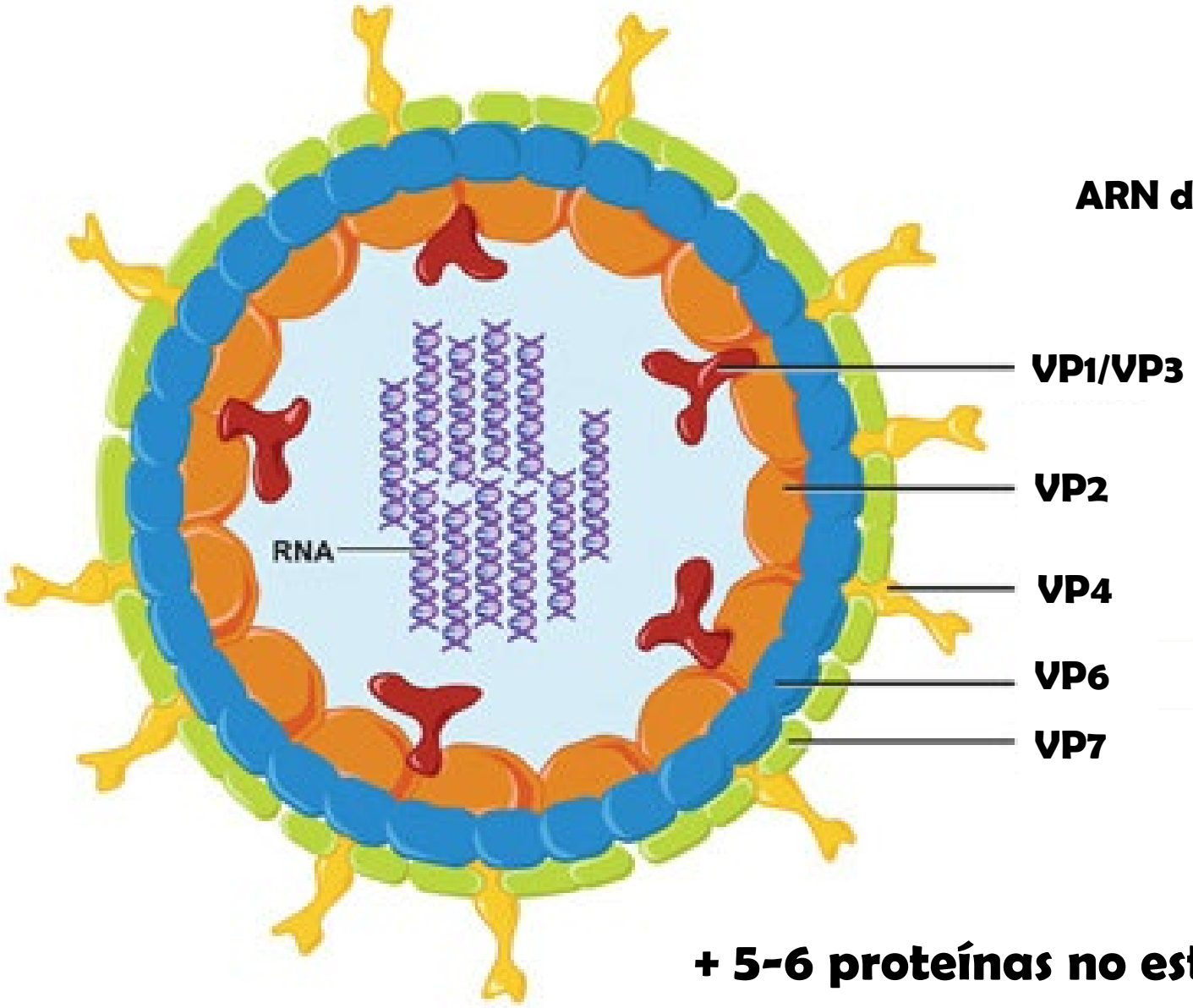
Familia *Reoviridae*

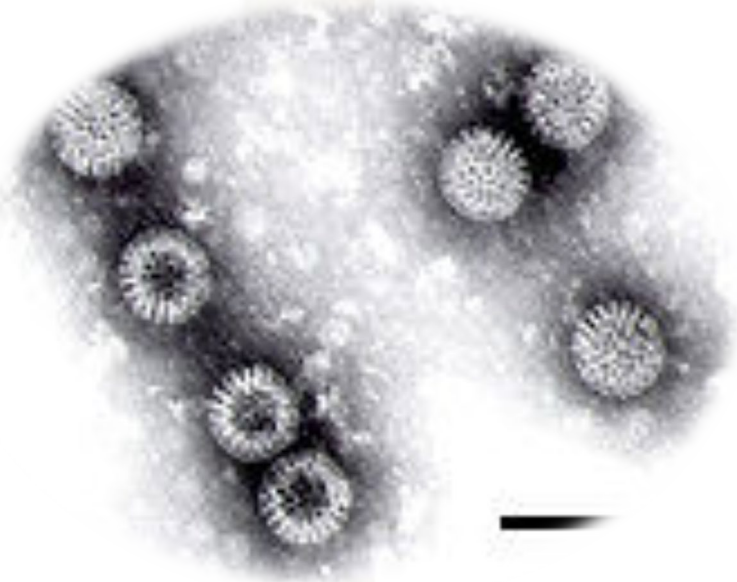
Género *Rotavirus*

Virus sin envoltura

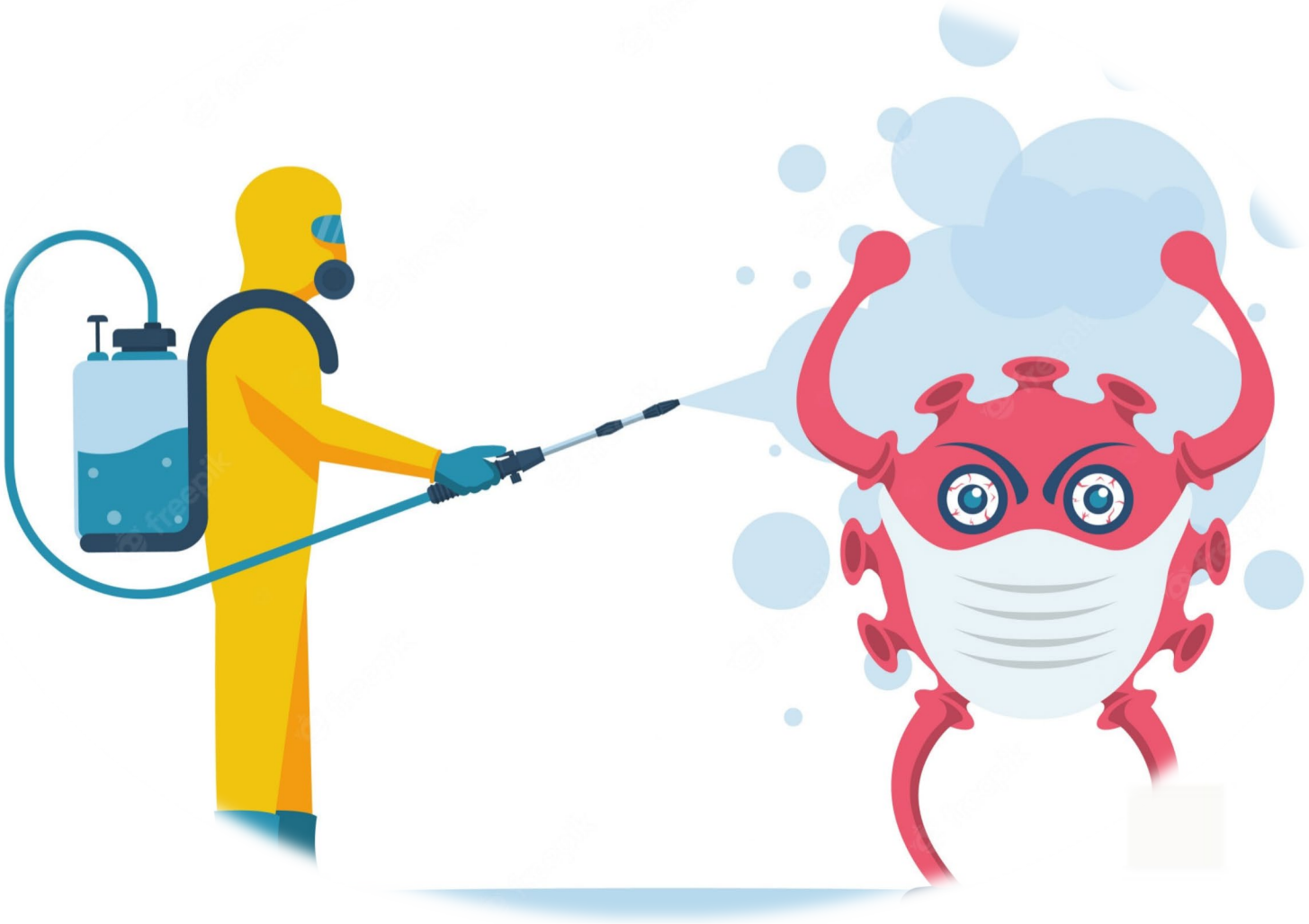
Triple cápside proteíca

ARN de doble cadena segmentado (11 segmentos)

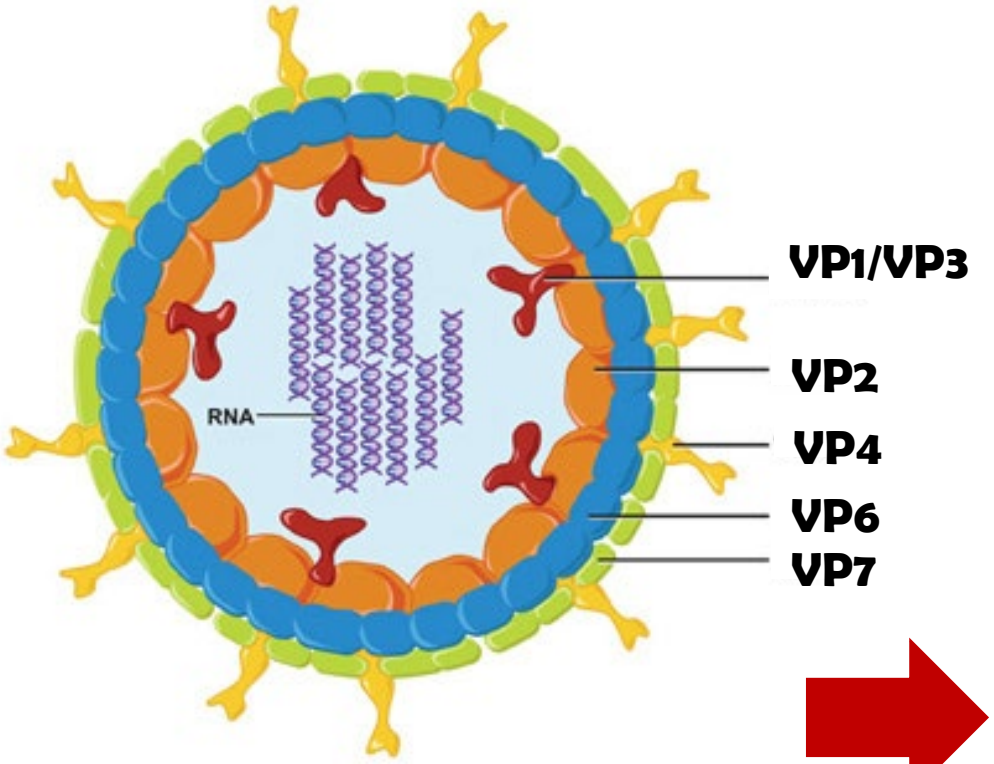




+ 5-6 proteínas no estructurales (NSP1 a 5)



- **Virus endémicos en las explotaciones porcinas**
- **No presentación estacional**



Familia *Reoviridae*

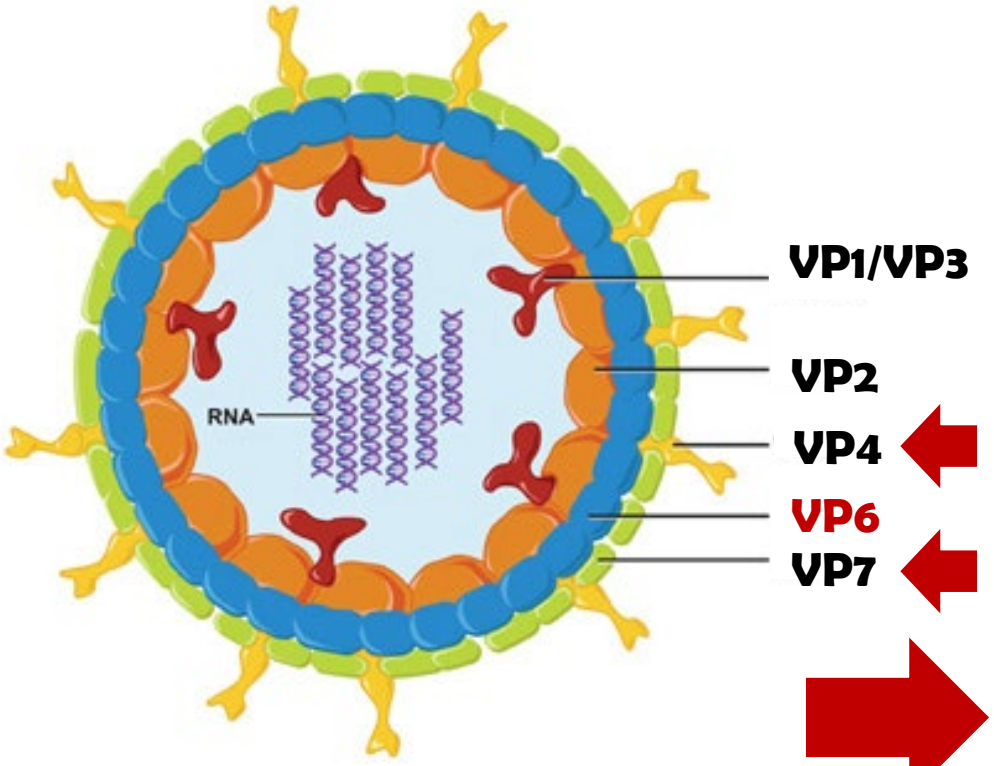
Género *Rotavirus*

Virus sin envoltura

Triple cápside proteíca

ARN de doble cadena segmentado (11 segmentos)

- **Gran variabilidad**



Familia *Reoviridae*

Género *Rotavirus*

Virus sin envoltura

Triple cápside proteíca

ARN de doble cadena segmentado (11 segmentos)

- **Gran variabilidad**

10 serogrupos (RVA a RVJ): VP6

Tipos G y P: VP7 y VP4

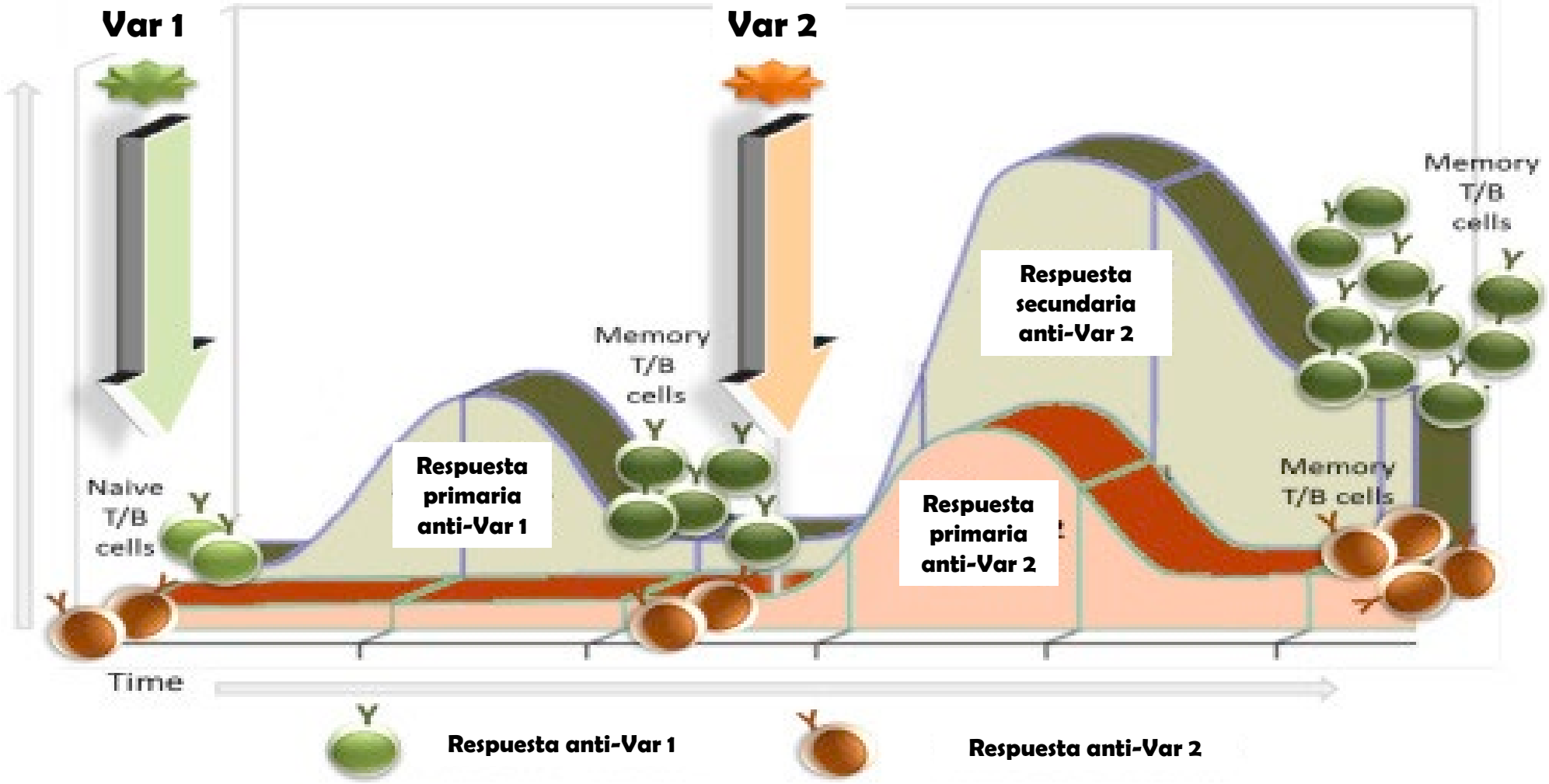
RVA → 12 tipos G y 17 tipos P

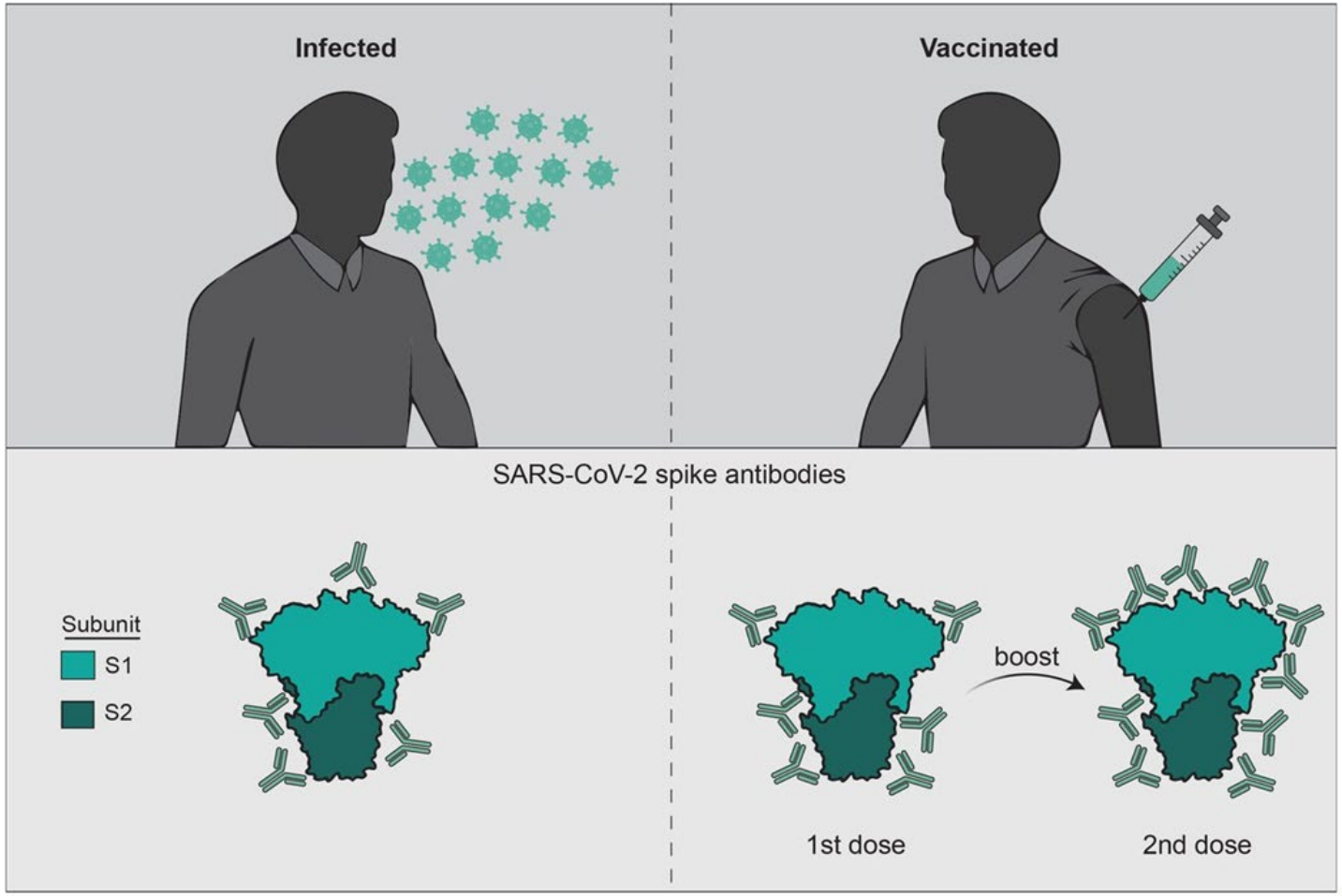
RVB

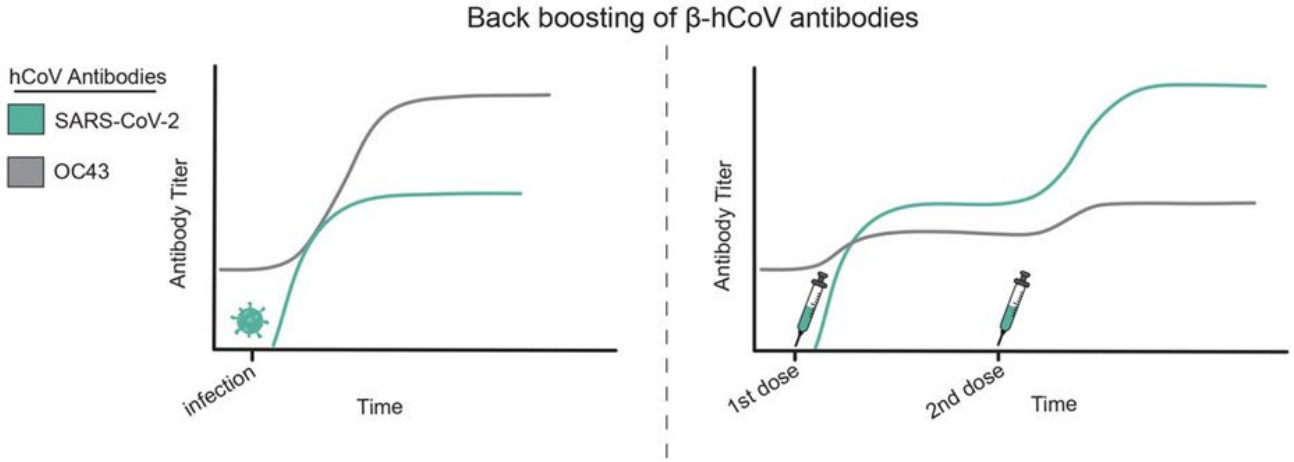
RVC → 18 tipos G y 21 tipos P (en mamíferos)

RVH

Original antigenic sin







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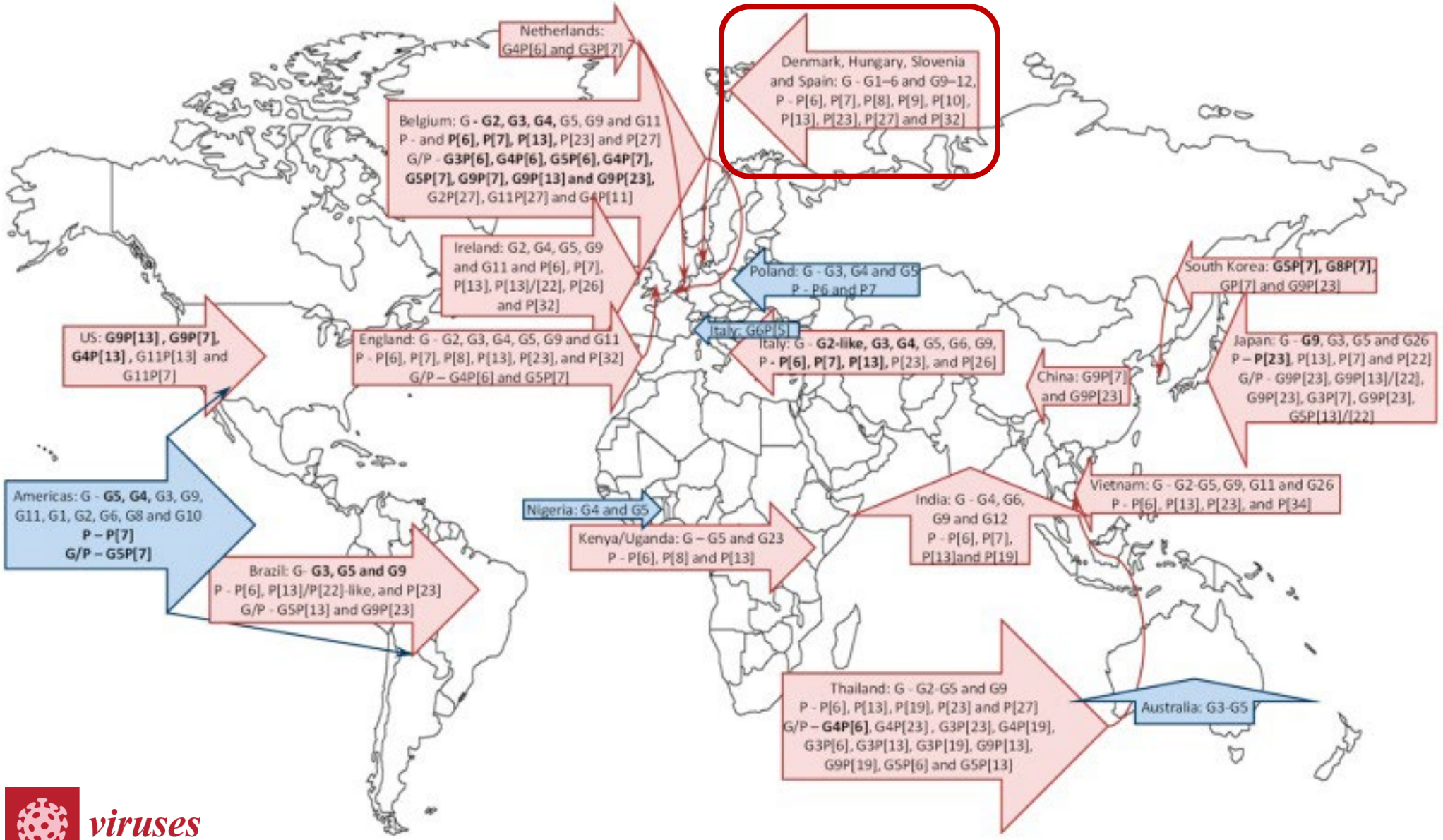
CSH Cold Spring Harbor Laboratory BMJ Yale

SARS-CoV-2 infections elicit higher levels of original antigenic sin antibodies compared to SARS-CoV-2 mRNA vaccinations

Elizabeth M. Anderson, Theresa Eilola, Eileen Goodwin, Marcus J. Bolton, Sigrid Gouma, Rishi R. Goel, Mark M. Painter, Sokratis A. Apostolidis, Divij Mathew, Debora Dunbar, Danielle Fiore, Amanda Brock, JoEllen Weaver, John S. Millar, Stephanie DerOhannessian, The UPenn COVID Processing Unit, Allison R. Greenplate, Ian Frank, Daniel J. Rader, E. John Wherry, Scott E. Hensley

doi: https://doi.org/10.1101/2021.09.30.21264363

Now published in *Cell Reports* doi: 10.1016/j.celrep.2022.111496



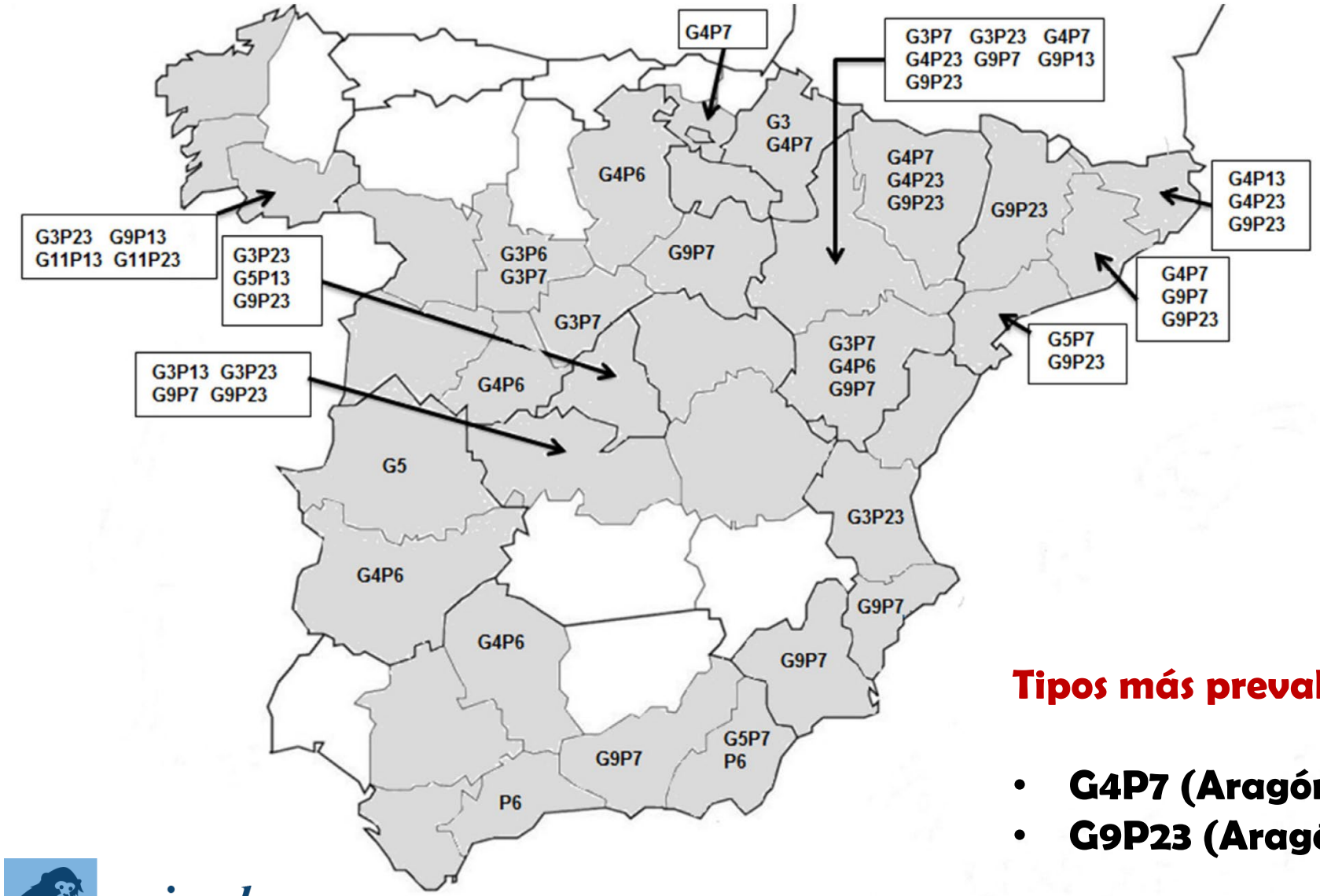
viruses

Open Access Review

Porcine Rotaviruses: Epidemiology, Immune Responses and Control Strategies

by Anastasia N. Vlasova [1,*], Joshua O. Amimo [2,3] and Linda J. Saif [1,*]

Tipos más prevalentes de RVA



Tipos más prevalentes de RVA

- **G4P7 (Aragón y Cataluña)**
- **G9P23 (Aragón y Cataluña)**

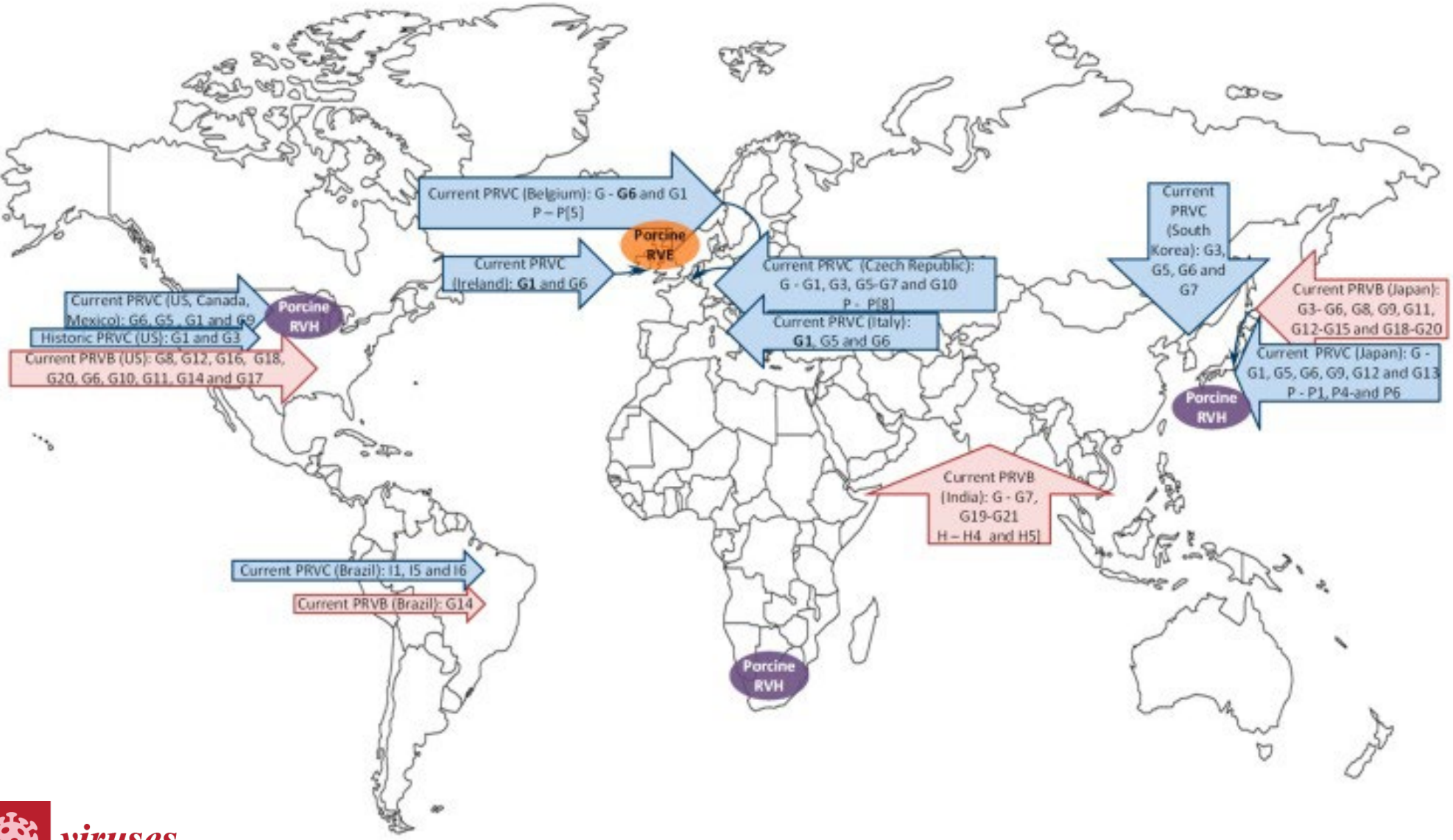
- **G9P7 (resto de España)**
- **G4P6 (resto de España)**

animals

Open Access Article

Occurrence of Rotavirus A Genotypes and Other Enteric Pathogens in Diarrheic Suckling Piglets from Spanish Swine Farms

by Luis V. Monteagudo [1,2], Alfredo A. Benito [3], Sofía Lázaro-Gaspar [3], José L. Arnal [3], Desirée Martin-Jurado [3], Rut Menjon [4] and Joaquín Quílez [2,5,*]



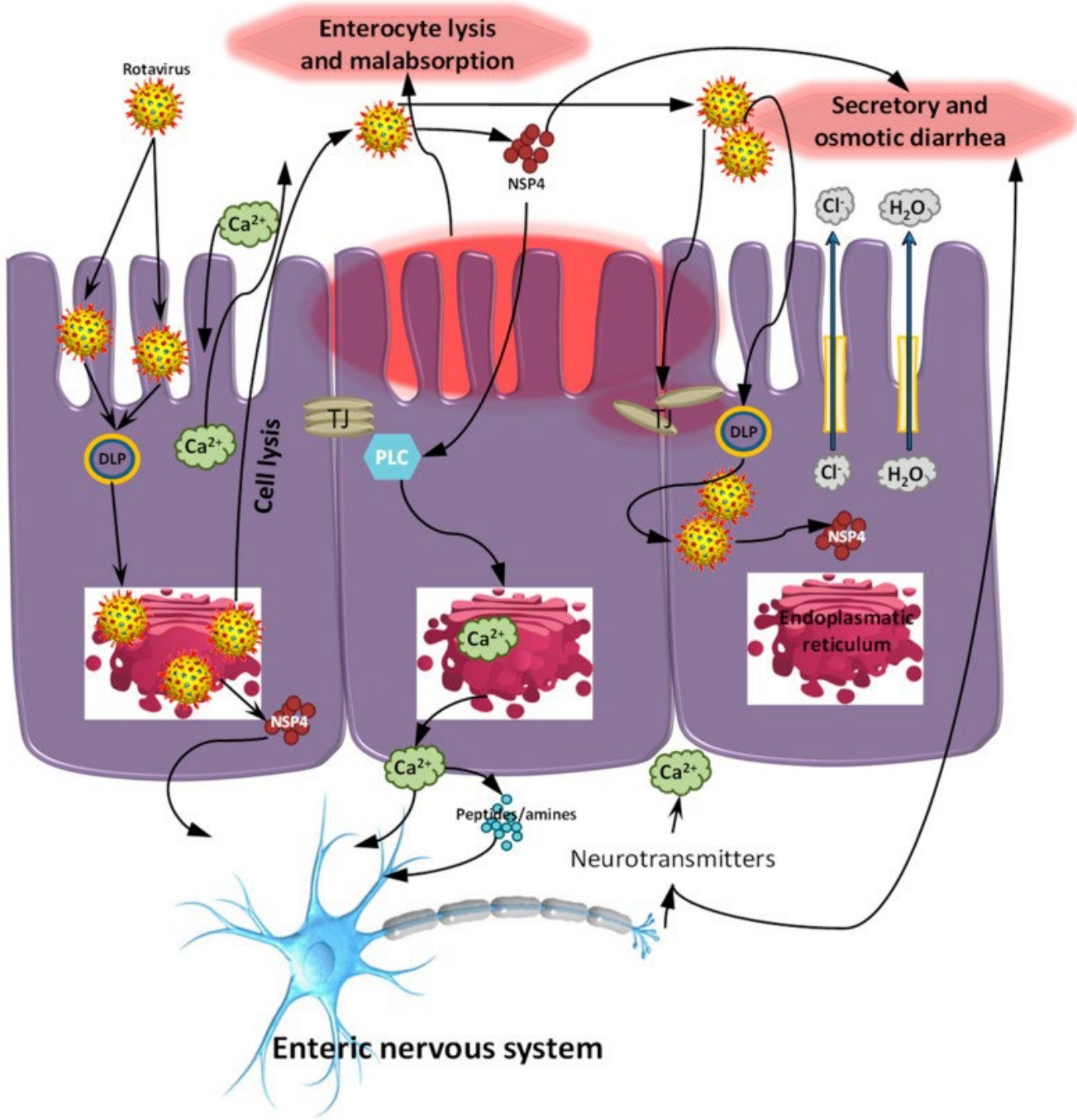
viruses

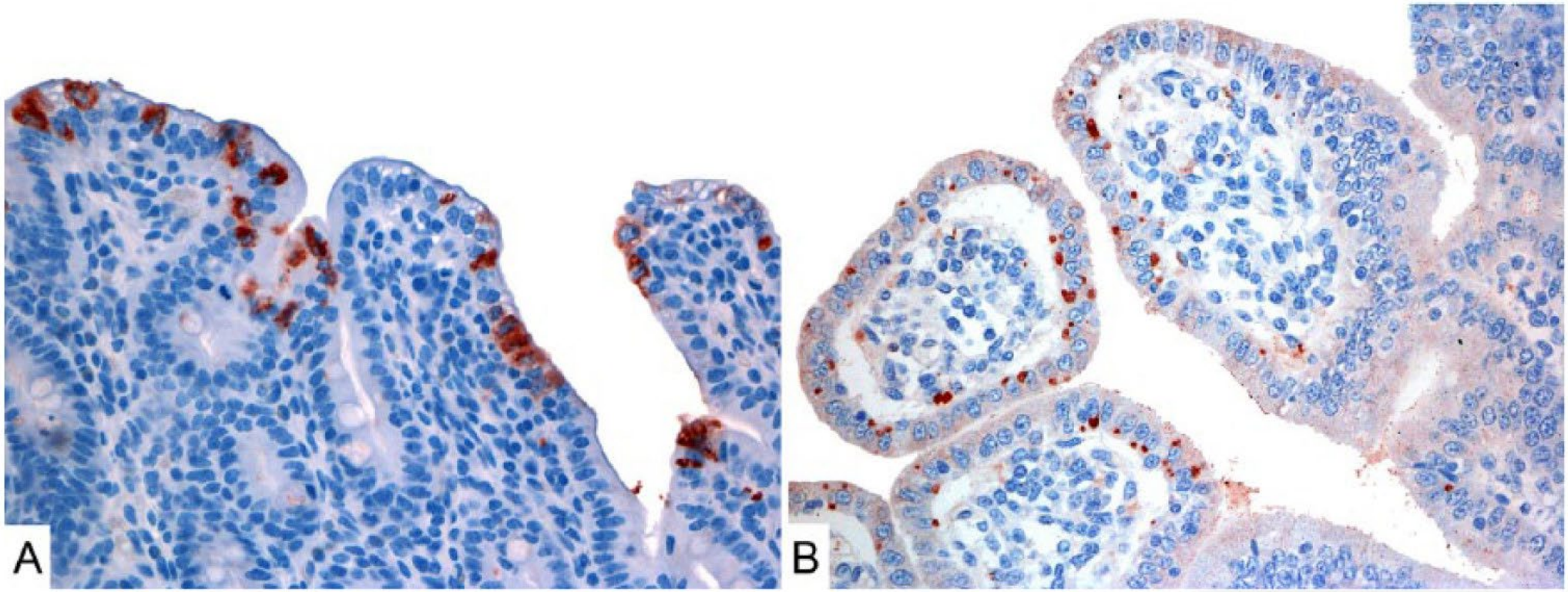
Open Access Review

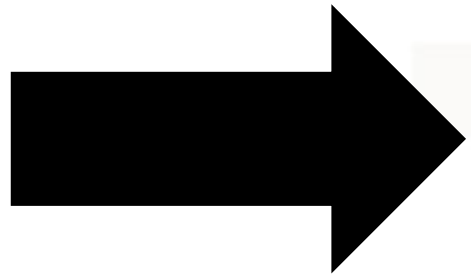
Porcine Rotaviruses: Epidemiology, Immune Responses and Control Strategies

by Anastasia N. Vlasova [1,*], Joshua O. Amimo [2,3] and Linda J. Saif [1,*]

Tipos más prevalentes de RVB y C


Enterocyte lysis and malabsorption
Secretory and osmotic diarrhea
Rotavirus
NSP4
Ca^{2+}
Cl^-
H_2O
TJ
DLP
PLC
Cell lysis
Endoplasmatic reticulum
Peptides/amines
Neurotransmitters
Enteric nervous system


A
B



RVA RVC

RVB RVH

?

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scientific reports

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OPEN

Porcine rotavirus B as primary causative agent of diarrhea outbreaks in newborn piglets

Flavia Megumi Miyabe[1,2], Alais Maria Dall Agnol[1,2], Raquel Arruda Leme[1,2], Thalita Evani Silva Oliveira[3], Selwyn Arlington Headley[3], Thiago Fernandes[4], Admilton Gonçalves de Oliveira[4], Alice Fernandes Alfieri[1,2] & Amauri Alcindo Alfieri[1,2]✉

Rotavirus (RV) is considered a major cause of acute viral gastroenteritis in young animals. RV is classified into nine species, five of which have been identified in pigs. Most studies worldwide have highlighted diarrhoea outbreaks caused by RVA, which is considered the most important RV species. In the present study, we described the detection and characterization of porcine RVB as a primary causative agent of diarrhoea outbreaks in pig herds in Brazil. The study showed a high frequency (64/90; 71.1%) of RVB diagnosis in newborn piglets associated with marked histopathological lesions in the small intestines. Phylogenetic analysis of the VP7 gene of wild-type RVB strains revealed a high diversity of G genotypes circulating in one geographic region of Brazil. Our findings suggest that RVB may be considered an important primary enteric pathogen in piglets and should be included in the routine differential diagnosis of enteric diseases in piglets.

RVA

RVC

RVB

RVH

?

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Transboundary and Emerging Diseases

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First identification and characterization of rotavirus H in swine in Spain

Héctor Puente, Marti Cortey, Pedro J. G. de Nova, Óscar Mencía-Ares, Manuel Gómez-García, Ivan Díaz, Héctor Arguello, Margarita Martín, Pedro Rubio, Ana Carvajal

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EID Journal > Volume 20 > Number 6—June 2014 > Main Article

Volume 20, Number 6—June 2014

Dispatch

Species H Rotavirus Detected in Piglets with Diarrhea, Brazil, 2012

Bruna L.D. Molinari, Elis Lorenzetti, Rodrigo A.A. Otonel, Alice F. Alfieri, and Amauri A. Alfieri
Author affiliations: UniversidadeEstadual de Londrina, Londrina, Parana, Brazil

Cite This Article

Abstract

We determined nucleotide and deduced amino acid sequences of the rotavirus gene encoding viral protein 6 from 3 fecal samples collected from piglets with diarrhea in Brazil, 2012. The analyses showed that the porcine rotavirus strains in Brazil are closely related to the novel species H rotavirus.

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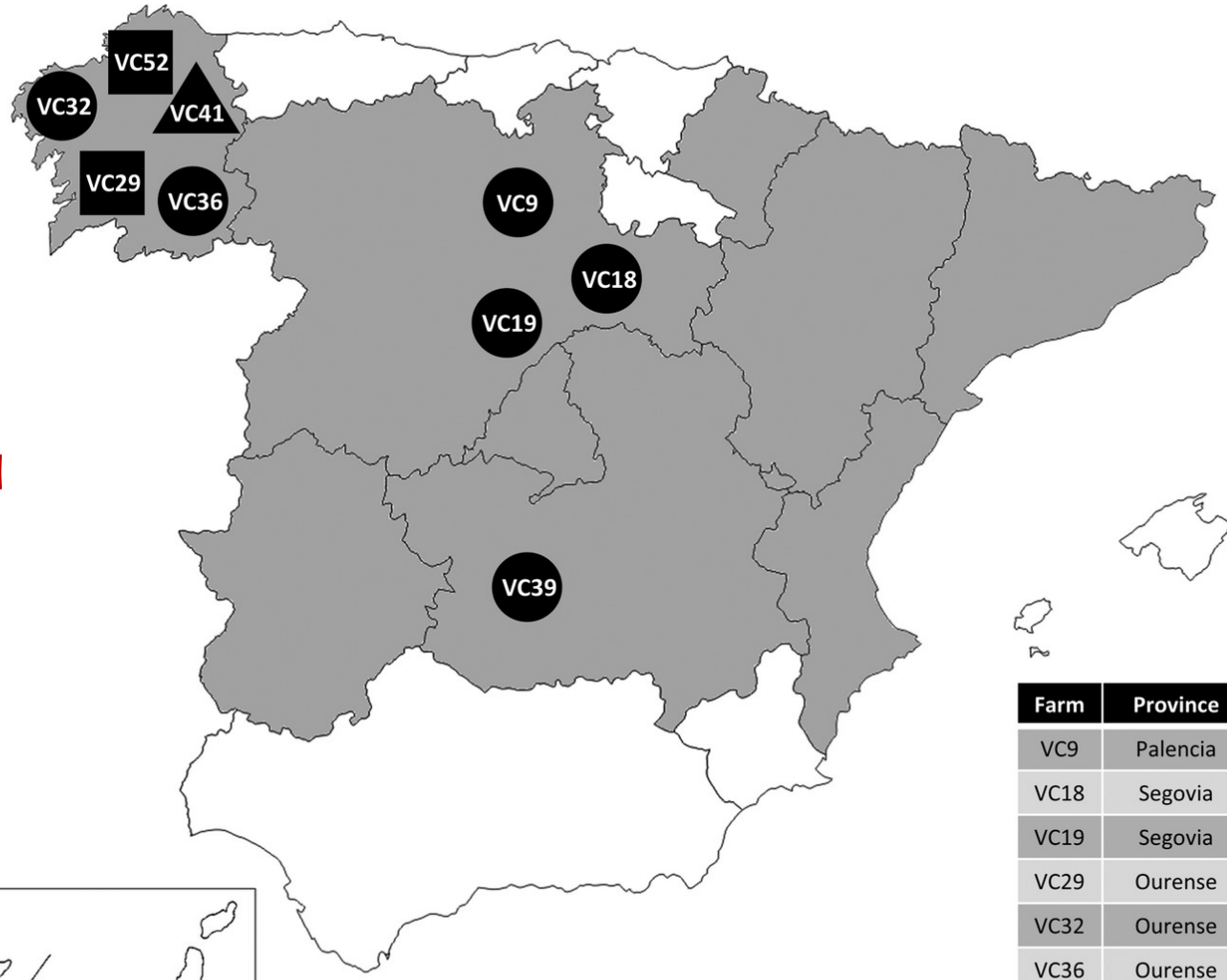
Volume 20, Number 7—July 2014

Dispatch

Widespread Rotavirus H in Commercially Raised Pigs, United States

Douglas Marthaler, Kurt Rossow, Marie Culhane, Sagar Goyal, Jim Collins, Jelle Matthijnssens, Martha Nelson, and Max Ciarlet
Author affiliations: University of Minnesota Veterinary Diagnostic Laboratory, Saint Paul, Minnesota, USA (D. Marthaler, K. Rossow, M. Culhane, S. Goyal, J. Collins); University of Leuven, Leuven, Belgium (J. Matthijnssens); Fogarty International Center of the National Institutes of Health, Bethesda, Maryland, USA (M. Nelson); Novartis Vaccines and Diagnostics, Inc., Cambridge, Massachusetts, USA (Max Ciarlet)

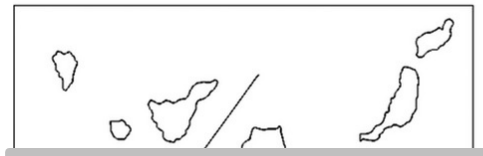


Nursing piglets
Post-weaning pigs
Fattening pigs

universidad de león

RVH

Farm	Province	Collection date	RVA	RVB	RVC	PEDV	TGEV
VC9	Palencia	25/01/2017	+	-	-	-	-
VC18	Segovia	07/03/2017	-	-	-	+	-
VC19	Segovia	07/03/2017	-	-	-	+	-
VC29	Ourense	06/06/2017	-	+	-	+	-
VC32	Ourense	11/07/2017	-	-	-	-	-
VC36	Ourense	04/08/2017	-	-	-	-	-
VC39	Ciudad Real	15/09/2017	+	-	-	-	-
VC41	A Coruña	19/10/2017	-	-	+	-	-
VC52	Ourense	02/02/2018	-	+	-	+	-



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- Coronavirus
- Rotavirus
- **Otros virus**

Ana Carvajal Urueña

DIGESPORC

Universidad de León

Journal of Comparative Pathology
Volume 181, November 2020, Pages 38-46

SPONTANEOUSLY ARISING DISEASE

Porcine Astrovirus Type 5-Associated Enteritis in Pigs

Tanja Opriessnig * †, Chao-Ting Xiao ‡, Patrick G. Halbur †

Acta Virol. 2019;63(1):96-102. doi: 10.4149/av_2019_112.

Experimental infection of conventional newly-weaned piglets with porcine astrovirus

J C Ulloa, A M Olarte-Aponte, J C Ospina, M A Rincon

PMID: 30879318 DOI: 10.4149/av_2019_112

Microbial Pathogenesis
Volume 170, September 2022, 105703

Pathogenic and metagenomic evaluations reveal the correlations of porcine epidemic diarrhea virus, porcine kobuvirus and porcine astroviruses with neonatal piglet diarrhea

Ming Qiu [a], Shubin Li [a], Yanzhao Xiao [a], Jixiang Li [a], Youwen Zhang [a], Xinshuai Li [a], Binghui Feng [a], Chen Li [a], Hong Lin [a], Jianzhong Zhu [a b c d], Nanhua Chen [a b c d]

First identification of mammalian orthoreovirus type 3 in diarrheic pigs in Europe

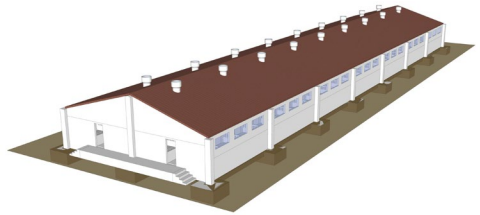
Davide Lelli[1*†], Maria Serena Beato[2†], Lara Cavicchio[2], Antonio Lavazza[1], Chiara Chiapponi[1], S
Laura Baioni[1], Paola De Benedictis[2] and Ana Moreno[1]

pathogens
Open Access Communication

High Rates of Detection and Molecular Characterization of Porcine Adenovirus Serotype 5 (*Porcine mastadenovirus C*) from Diarrheic Pigs

by Kerry Gainor [1,†], Yussaira Castillo Fortuna [1,†,‡], Angeline Steny Alakkaparambil [1,2,†], Wendy González [3,4], Yashpal Singh Malik [5] and Souvik Ghosh [1,*]

Enero de 2017 a octubre de 2020

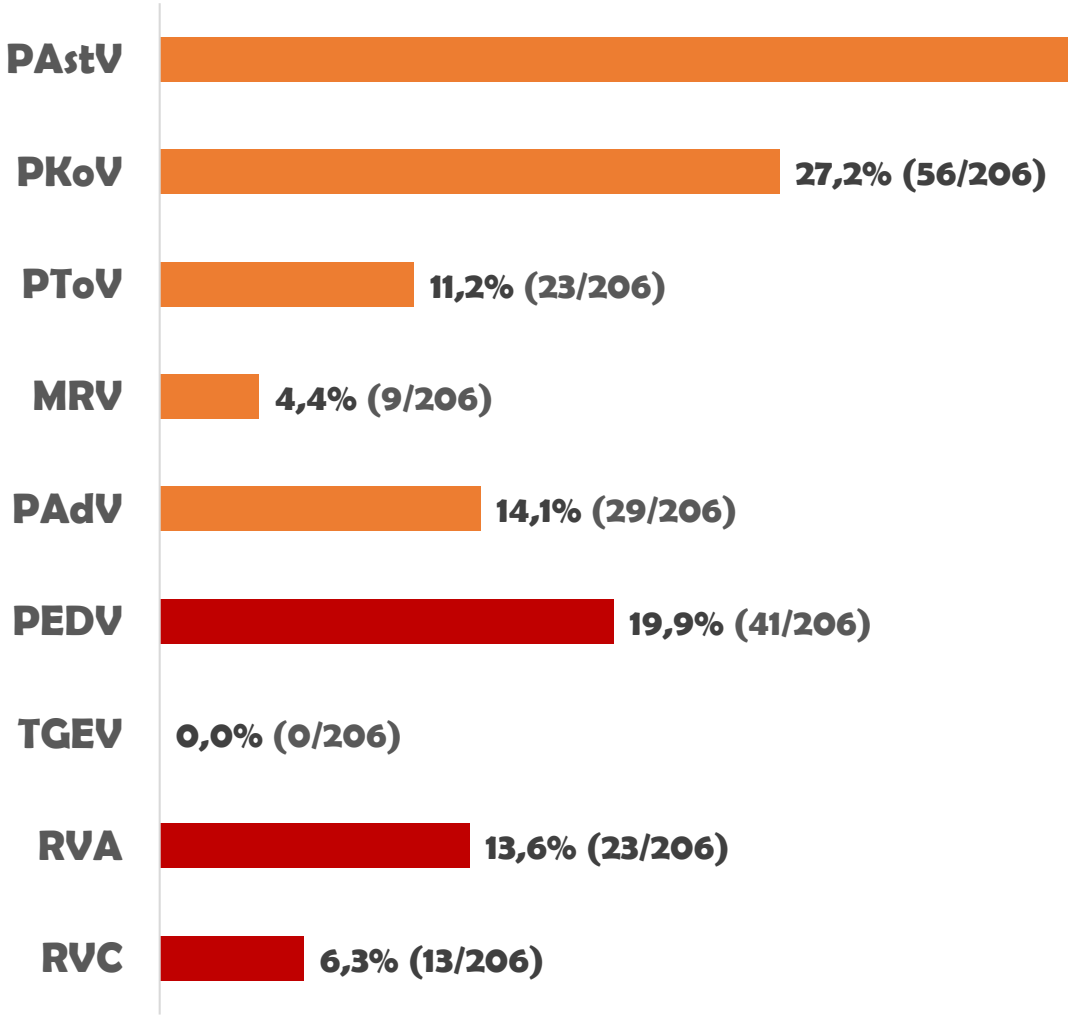


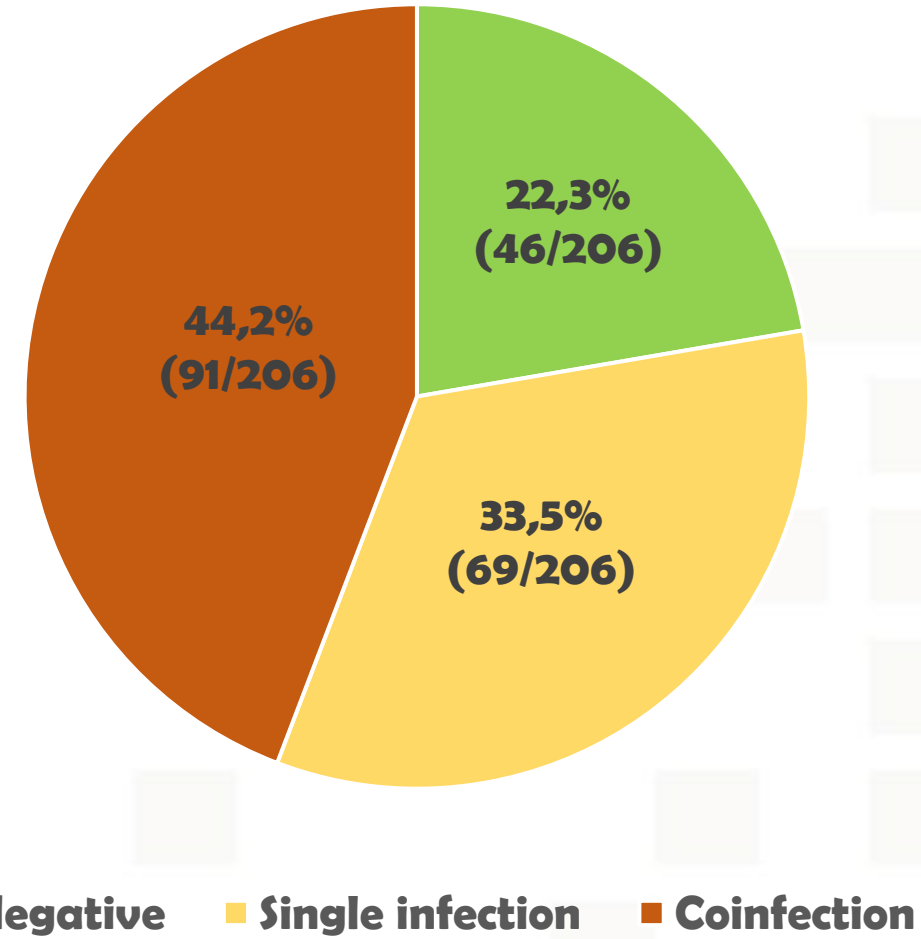
206 granjas de cerdos con brotes de diarrea

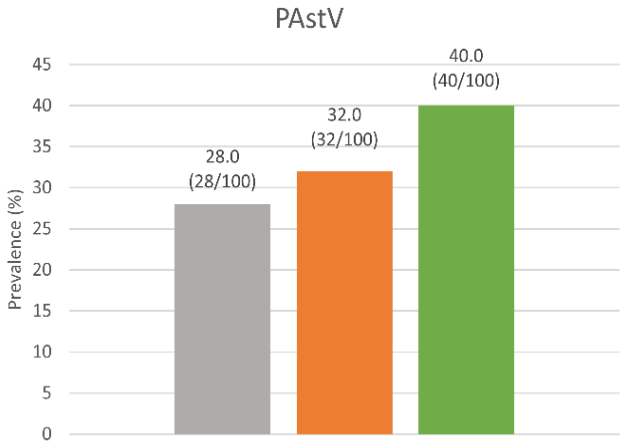
- 66 explotaciones con brotes en lactación
- 64 explotaciones con brotes en transición
- 76 explotaciones con brotes en cebo o reproductoras

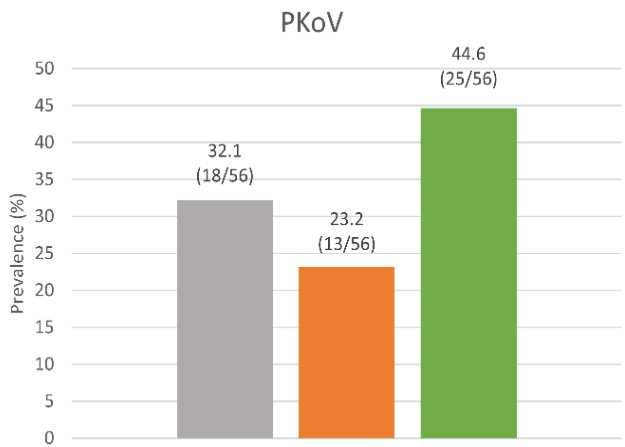
- 103 explotaciones con brotes sin sospecha de implicación vírica
- 103 explotaciones con brotes con sospecha de implicación vírica

Prevalence


PAstV
48,5% (100/206)
PKoV
27,2% (56/206)
PToV
11,2% (23/206)
MRV
4,4% (9/206)
PAdV
14,1% (29/206)
PEDV
19,9% (41/206)
TGEV
0,0% (0/206)
RVA
13,6% (23/206)
RVC
6,3% (13/206)


22,3%
(46/206)
33,5%
(69/206)
44,2%
(91/206)
Negative
Single infection
Coinfection

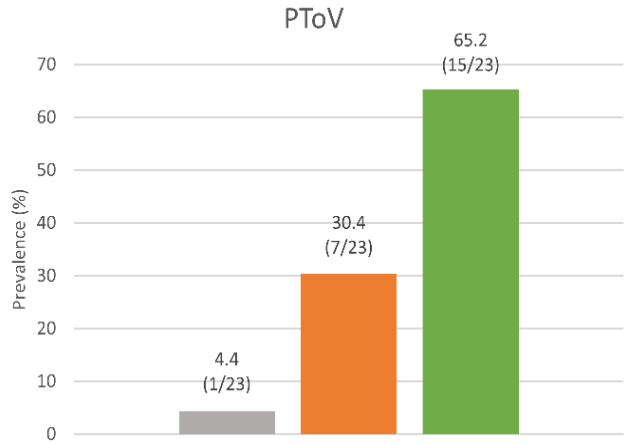


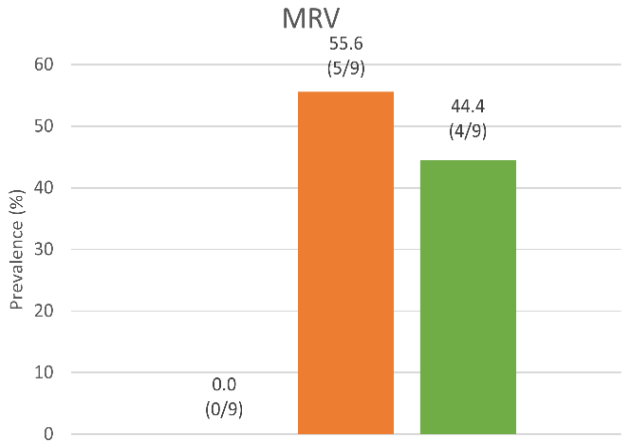


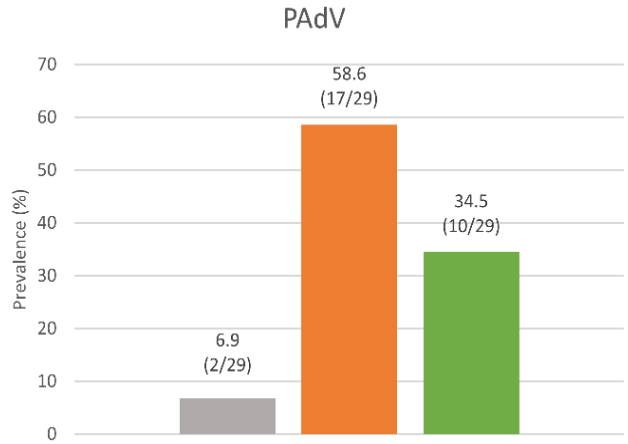
Single infection

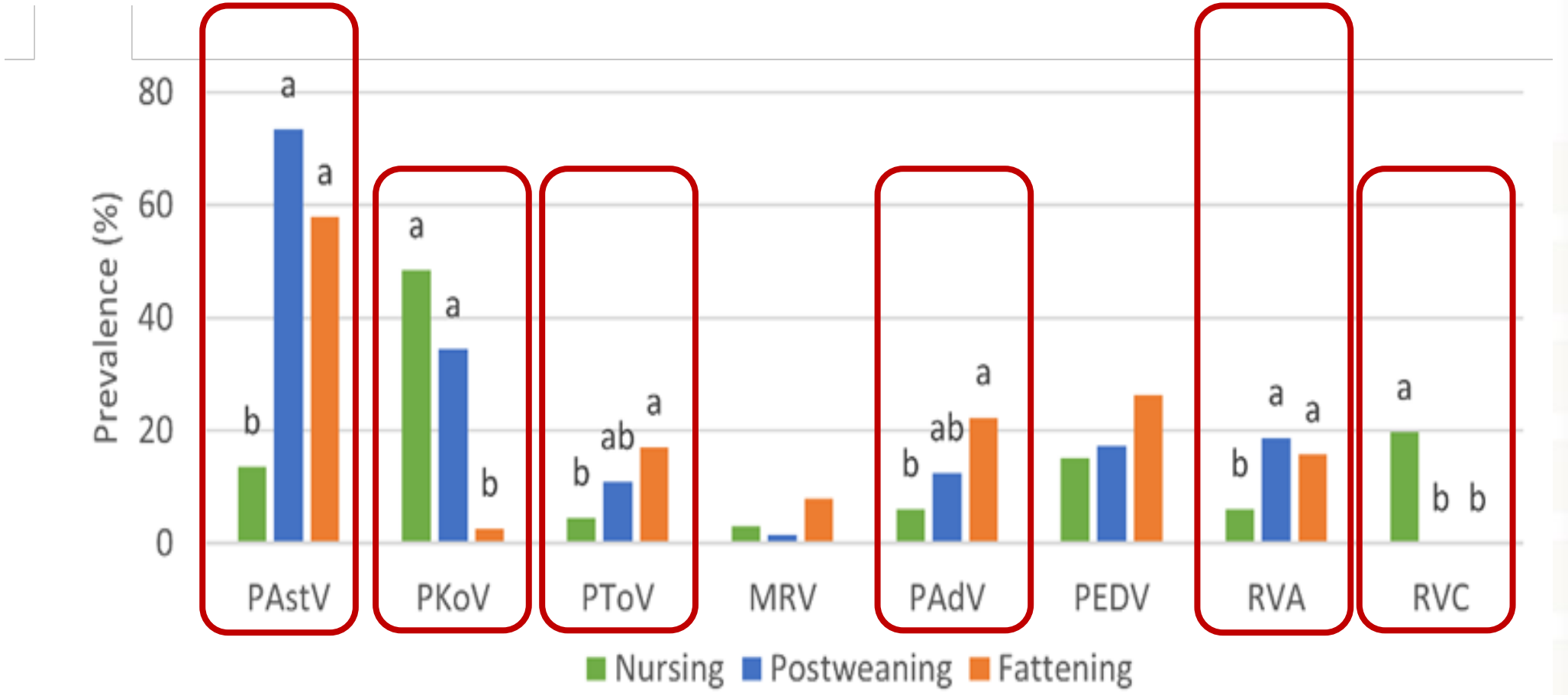
Coinfection with potential pathogenic viruses (PAstV, PKoV, PToV, MRV and PAdV)

Coinfection with well-recognized pathogenic viruses (PEDV, RVA and RVC)








Prevalence (%)
80
60
40
20
0
a
a
b
a
a
b
b
ab
a
b
ab
a
a
a
b
a
a
b
b
b
PAstV
PKoV
PToV
MRV
PAdV
PEDV
RVA
RVC
Nursing
Postweaning
Fattening

Patogenicidad

- Estudios de casos y controles: frecuencia de detección similar en animales CON y SIN cuadro clínico de diarrea
- Infecciones mixtas muy frecuentes (difícil caracterizar su efecto)
- Virus no adaptados a cultivo celular
- Gran dificultad en la valoración de lesiones por inmunohistoquímica
- …

Diagnóstico

Presentación clínica y epidemiológica

Lesiones macroscópicas

Laboratorio

Presentación clínica y epidemiológica

Lesiones macroscópicas

Laboratorio


3 a 6 muestras de heces por granja

Extracción de ARN (kit comercial)

RT-PCR o RT-qPCR

Sensibilidad analítica

10^3-10^4 $DICC_{50}$/g

RT-PCR o
RT-qPCR

+

Coronavirus

- Detección siempre asociada a complejo entérico

Rotavirus

- Datos clínico-epidemiológicos
- Cuantificación (qPCR)
- Estudios histológicos
- Inmunohistoquímica

Coronavirus

Rotavirus

Otros virus entéricos

Coronavirus

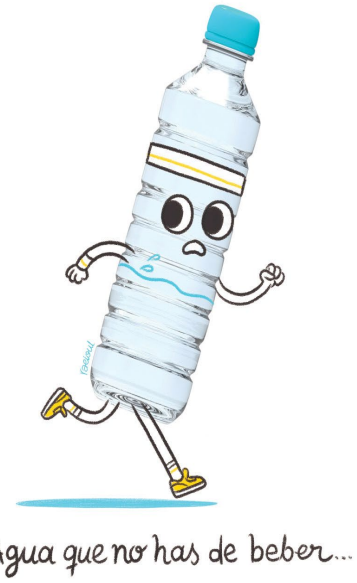
- PEDV
- Si existe sospecha clara y PEDV negativo, otros: TGEV, SECoV…

Rotavirus

- RVA
- RVC

- Tipo/s circulante/s en las distintas etapas ????

Otros virus entéricos



GRACIAS POR VUESTRO INTERÉS Y ATENCIÓN

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