



ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

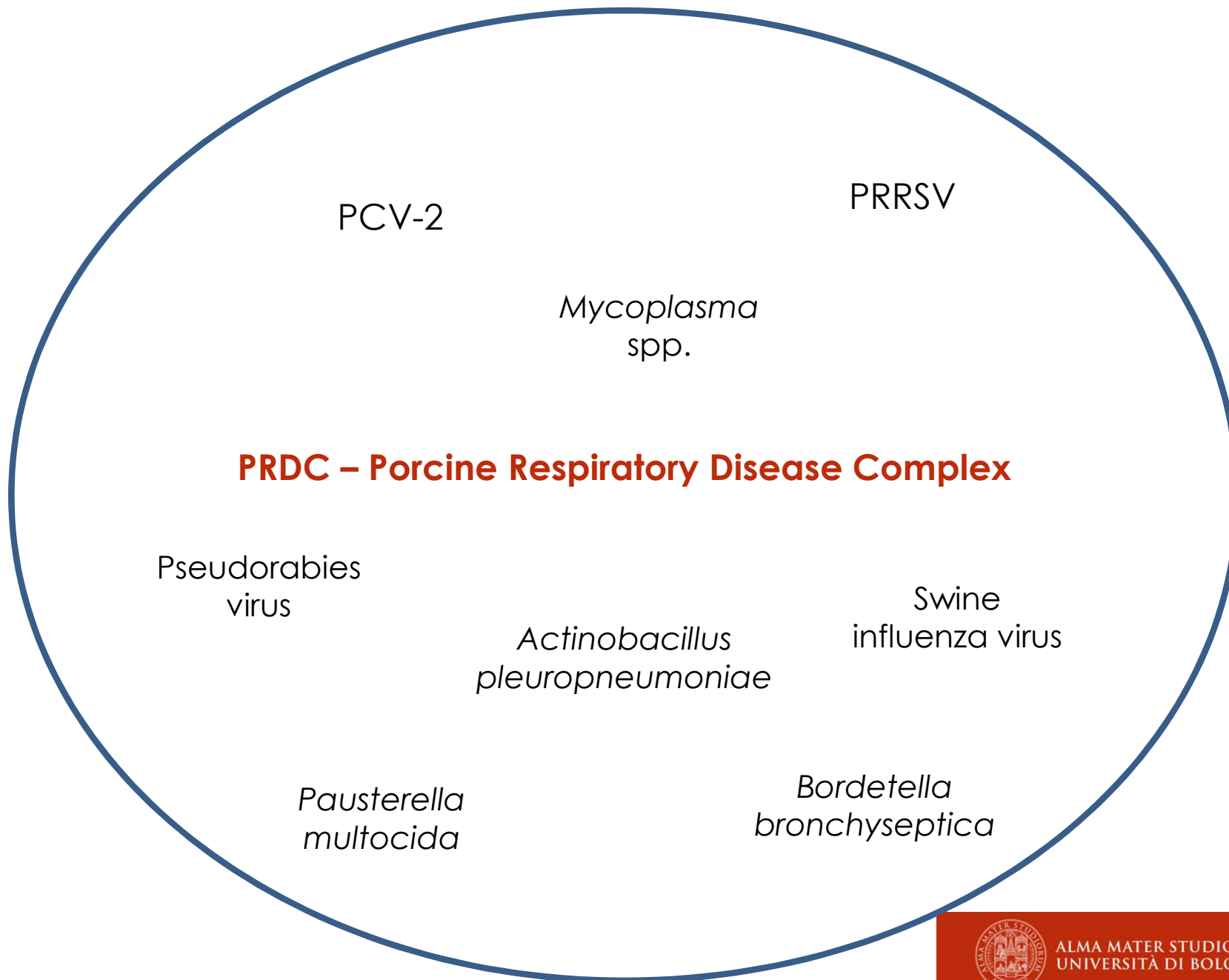
**L'istopatologia in diagnostica suina:
quando una metodica diventa
discriminante**

**La metodica diventa
discriminante nella
possibilità di
co-localizzare
l'agente eziologico
con le lesioni**

Giuseppe Sarli & Giulia D'Annunzio

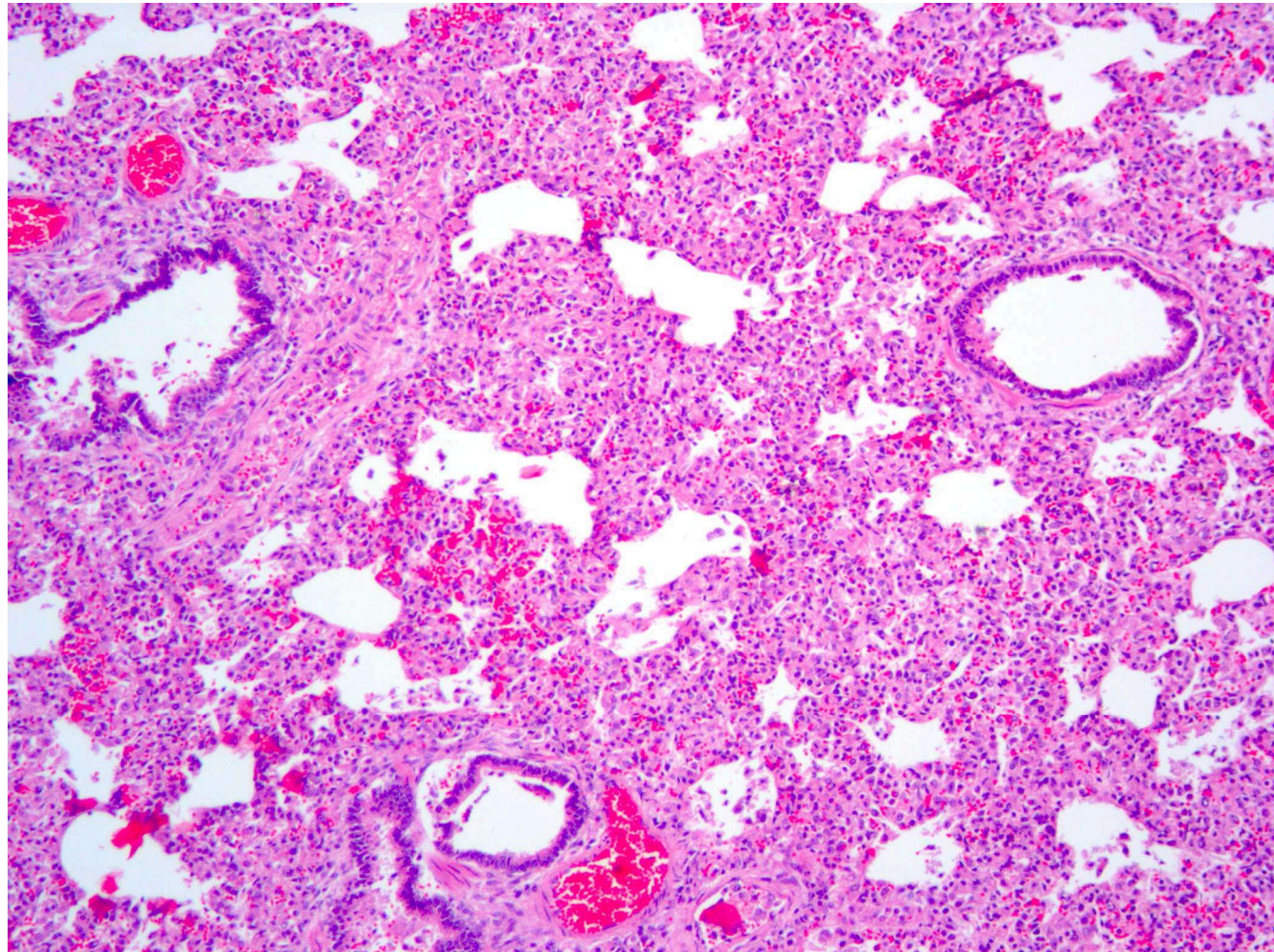
Casualità o causalità?





PRDC – Porcine Respiratory Disease Complex

Polmonite interstiziale

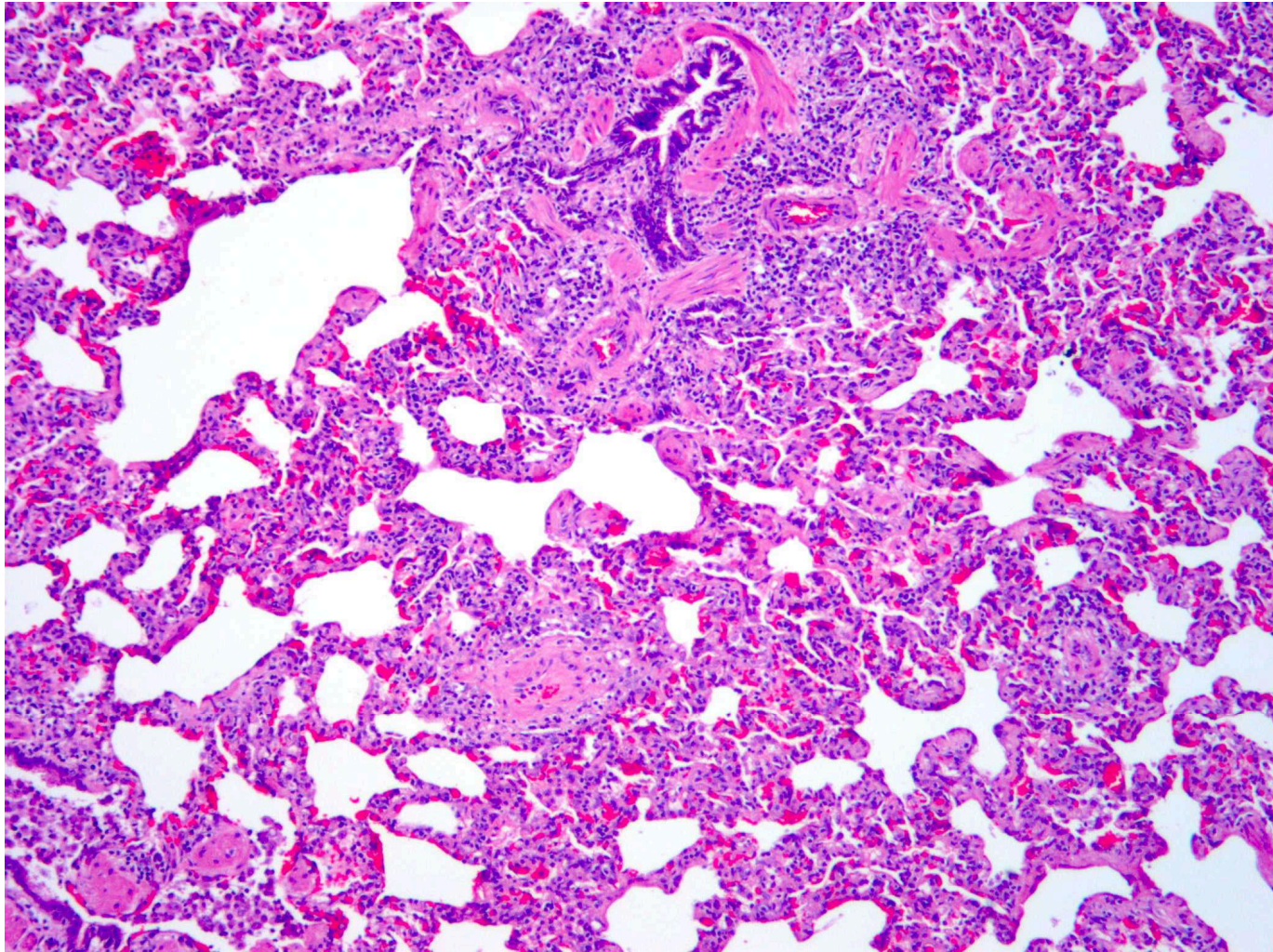


PCV-2



PRDC – Porcine Respiratory Disease Complex

Polmonite interstiziale



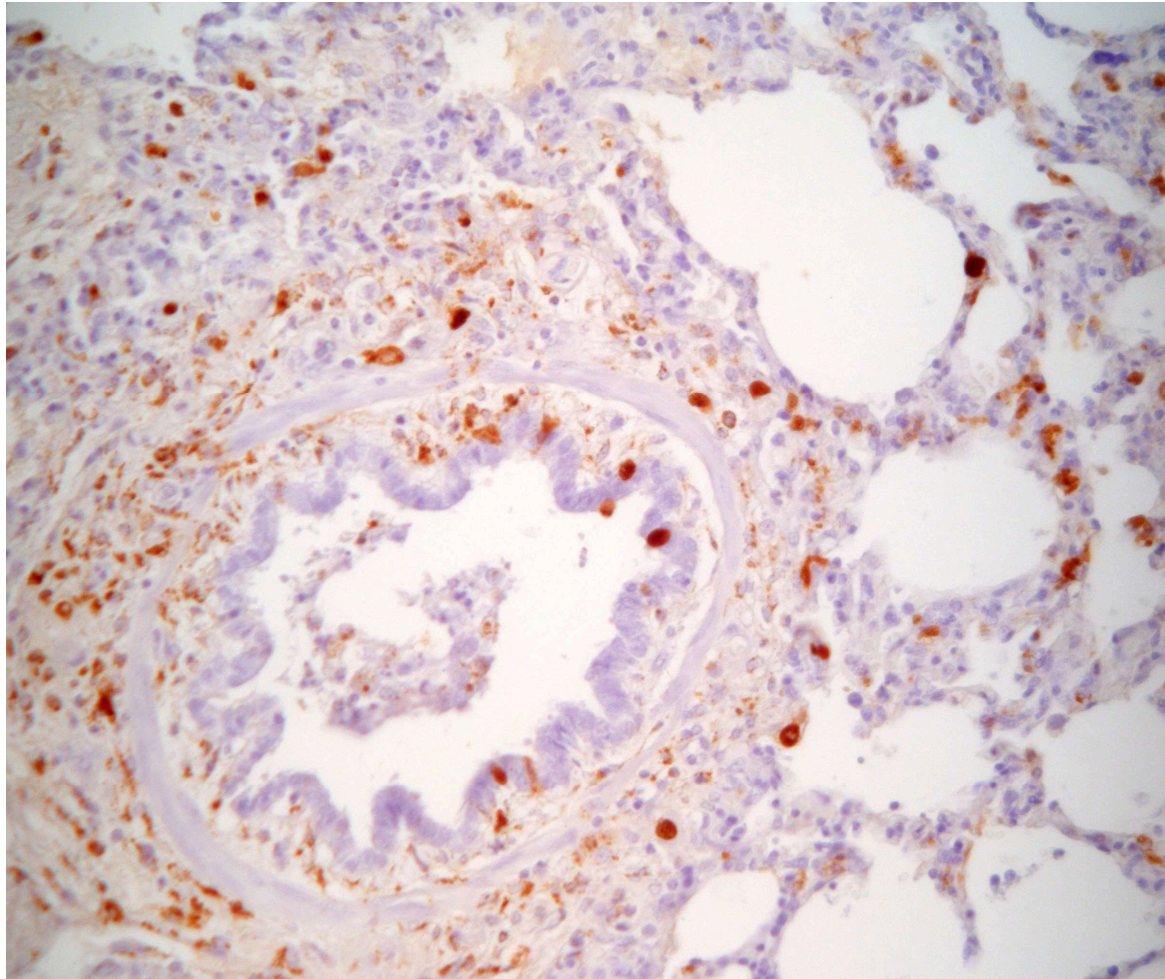
PCV-2

PRRSV



PRDC – Porcine Respiratory Disease Complex

Polmonite interstiziale – Immunoistochimica (IHC)



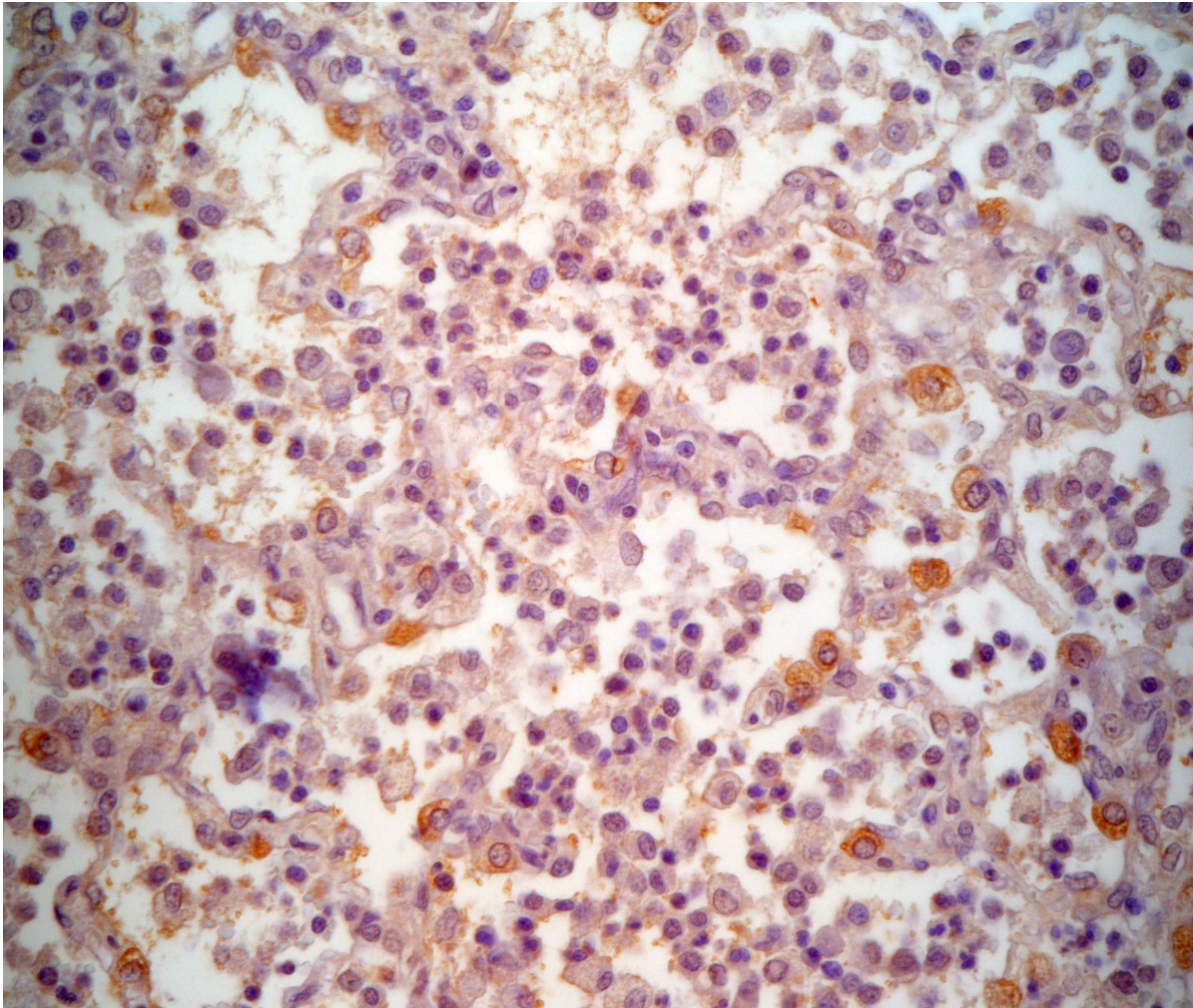
PCV-2

Positività immunoistochimica evidenziata con colorazione marrone del citoplasma di **macrofagi** nell'interstizio o nei macrofagi presenti a livello di essudato nel lume bronchiale



PRDC – Porcine Respiratory Disease Complex

Polmonite interstiziale – Immunoistochimica (IHC)



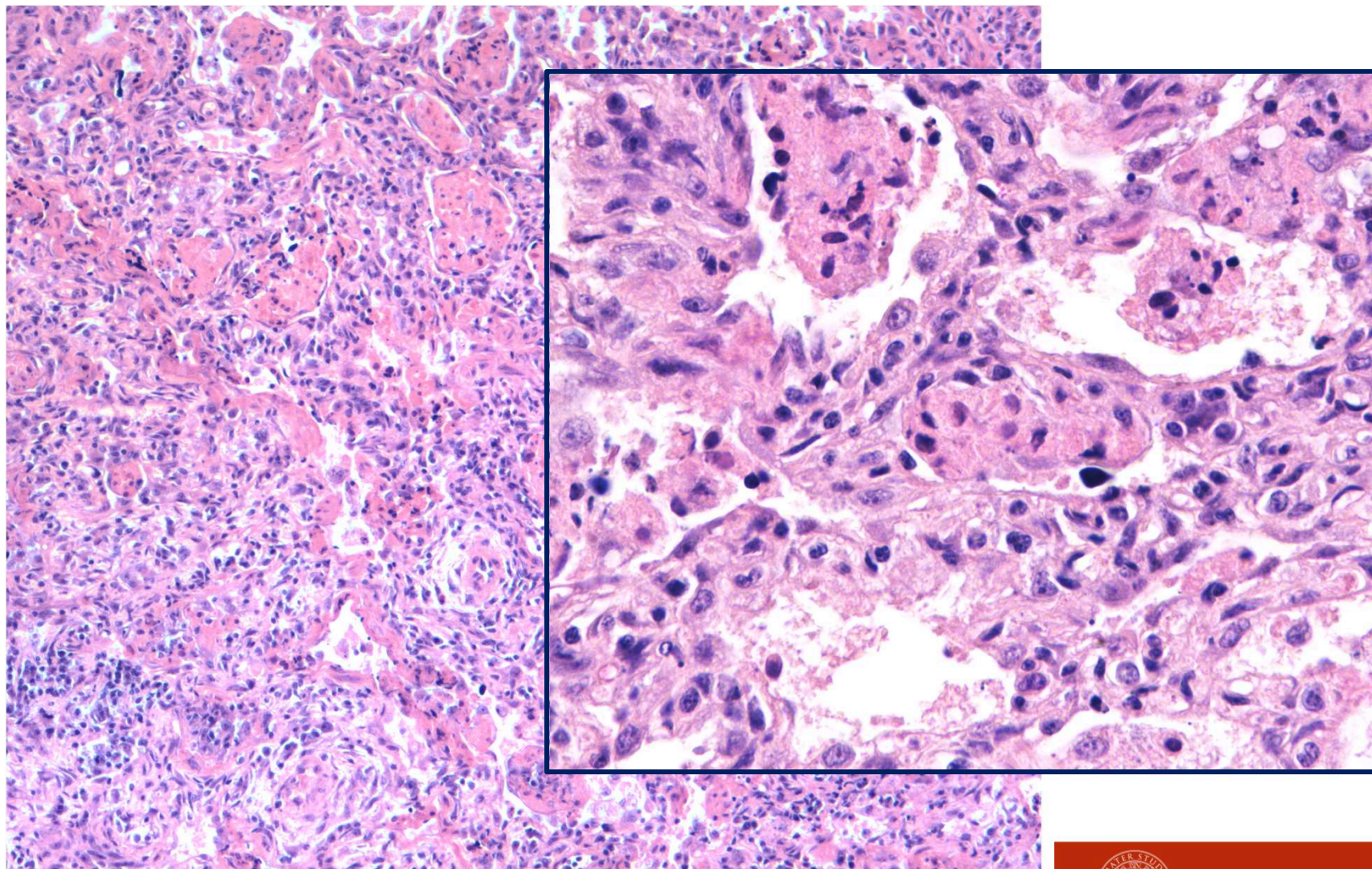
PRRSV

Positività immunoistochimica evidenziata con colorazione marrone del citoplasma degli **pneumociti di tipo II** proliferati lungo la parete degli alveoli



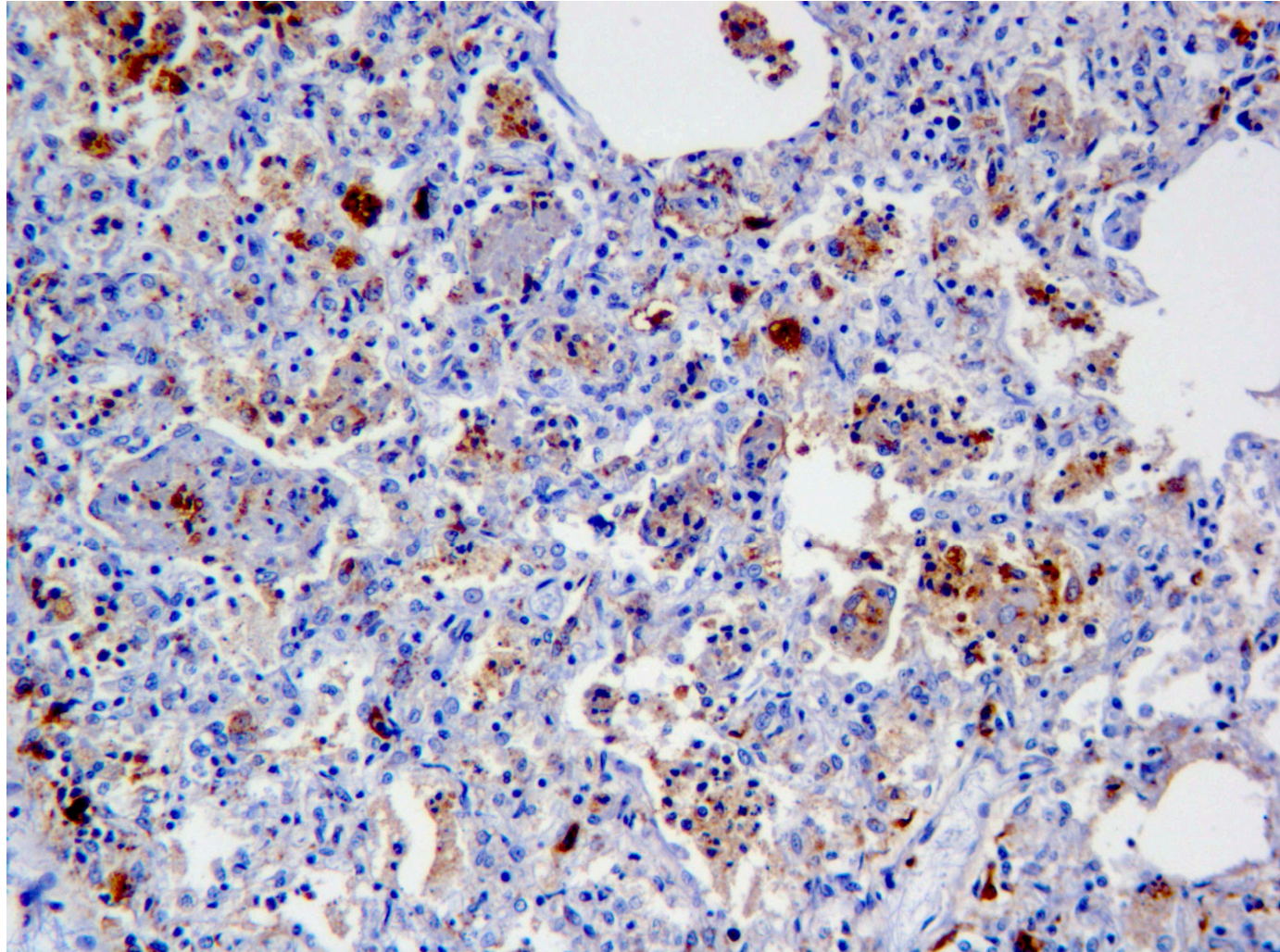
PRDC – Porcine Respiratory Disease Complex

Polmonite Proliferativa e Necrotizzante – PNP



PRDC – Porcine Respiratory Disease Complex

Polmonite Proliferativa e Necrotizzante – IHC



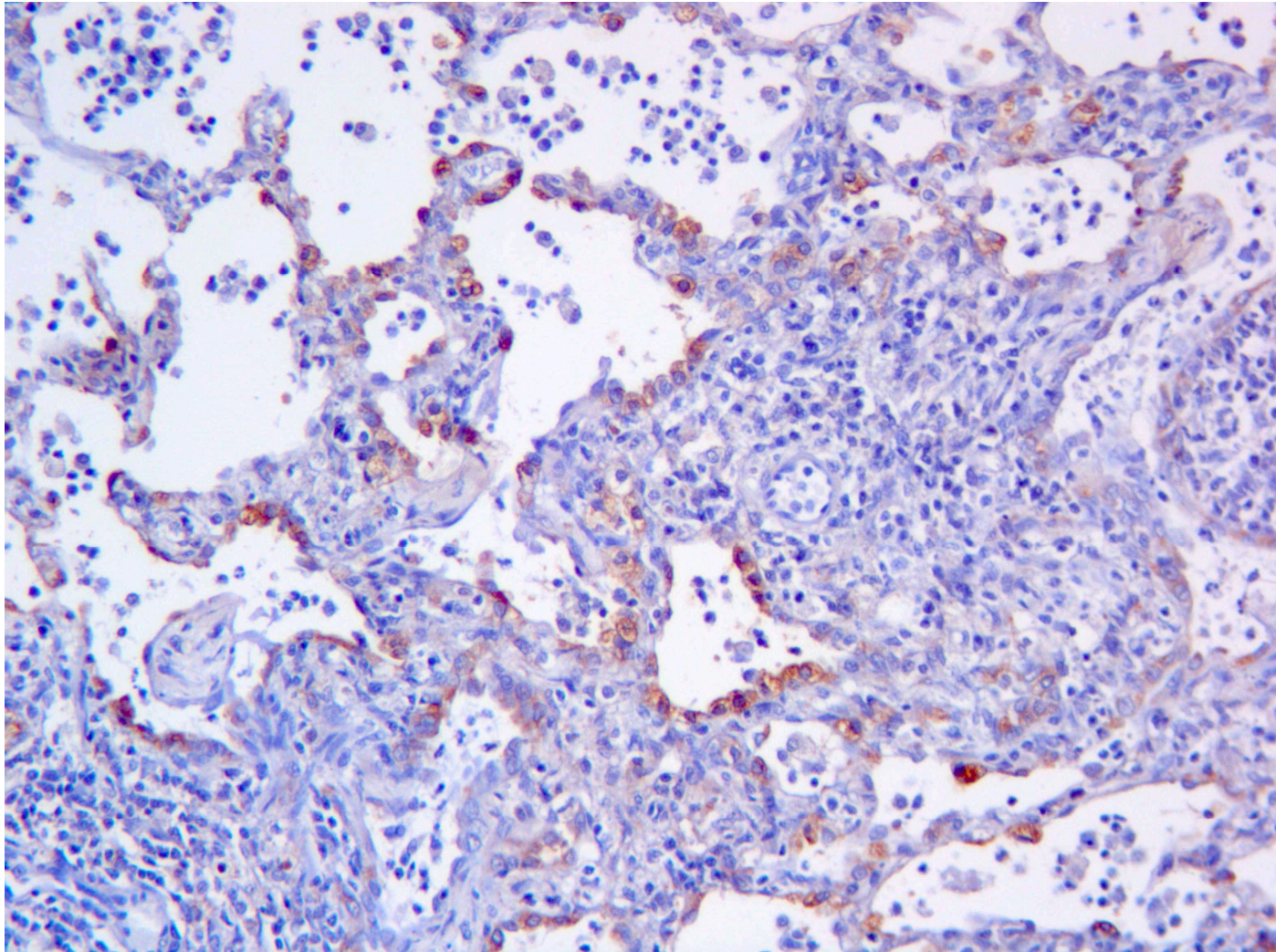
PCV-2



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PRDC – Porcine Respiratory Disease Complex

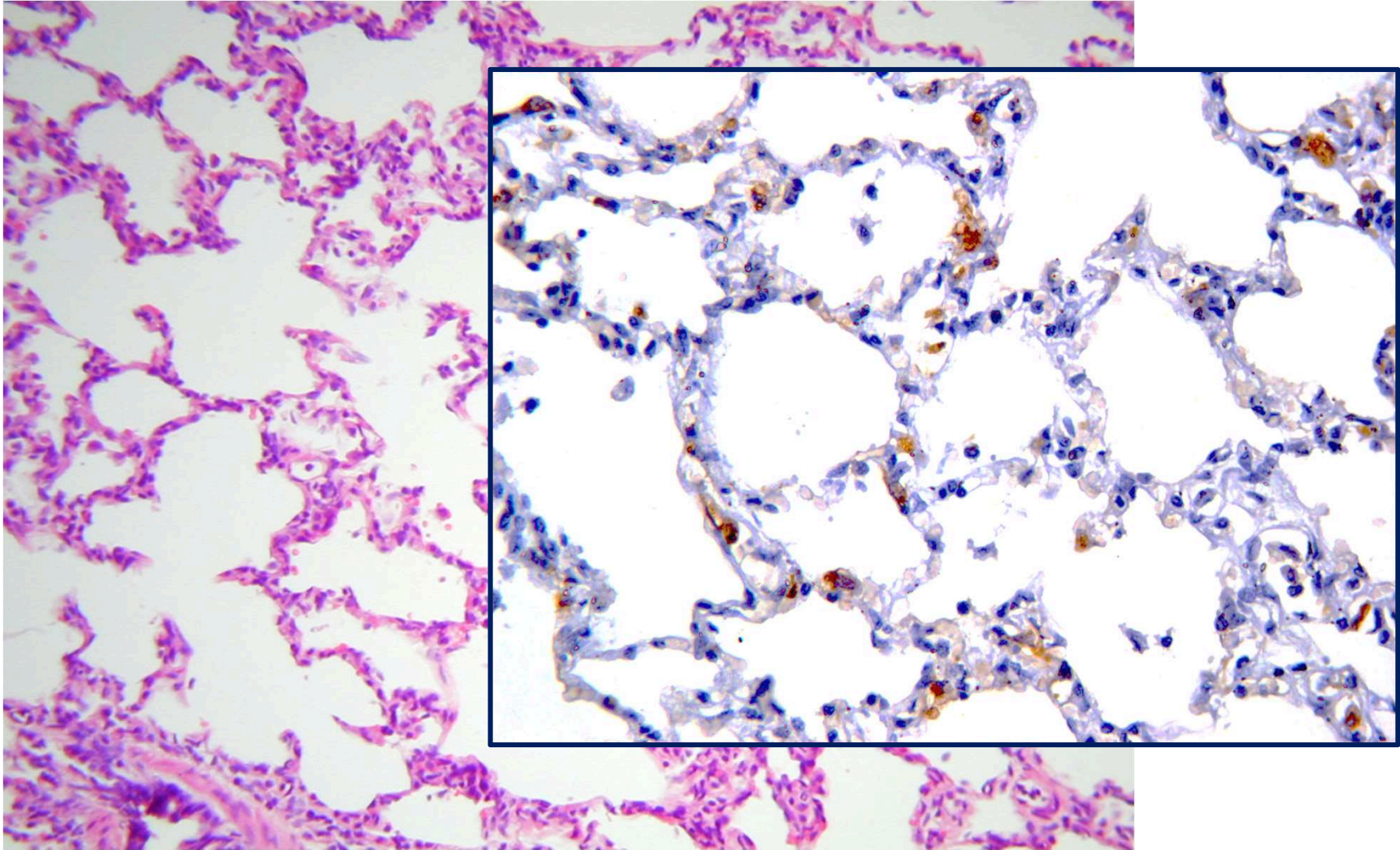
Polmonite Proliferativa e Necrotizzante – **IHC**



PRRSV

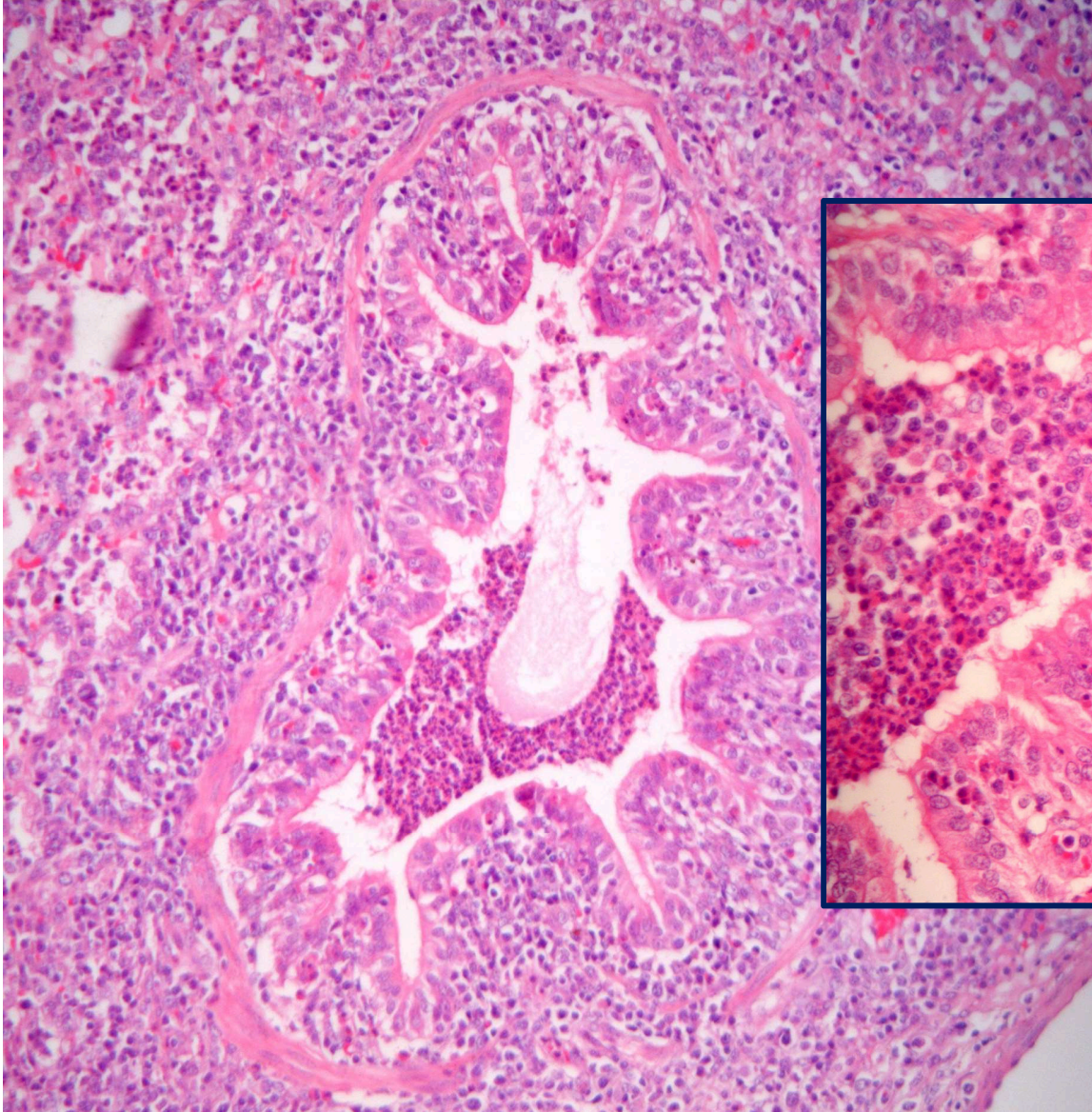


PRDC – Porcine Respiratory Disease Complex

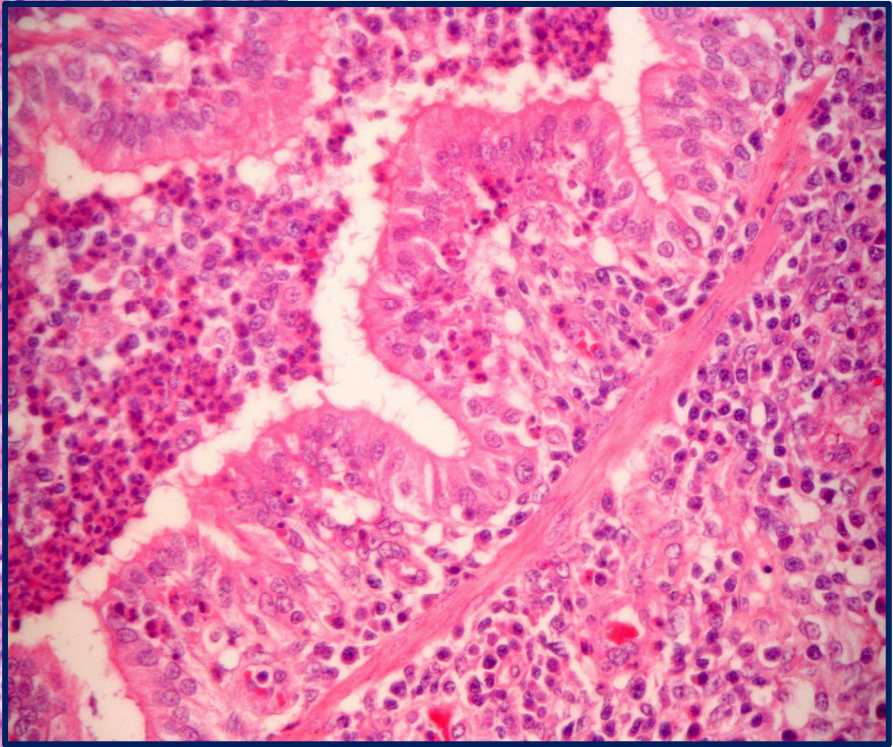


PRDC – Porcine Respiratory Disease Complex

Bronchiolite necrotizzante

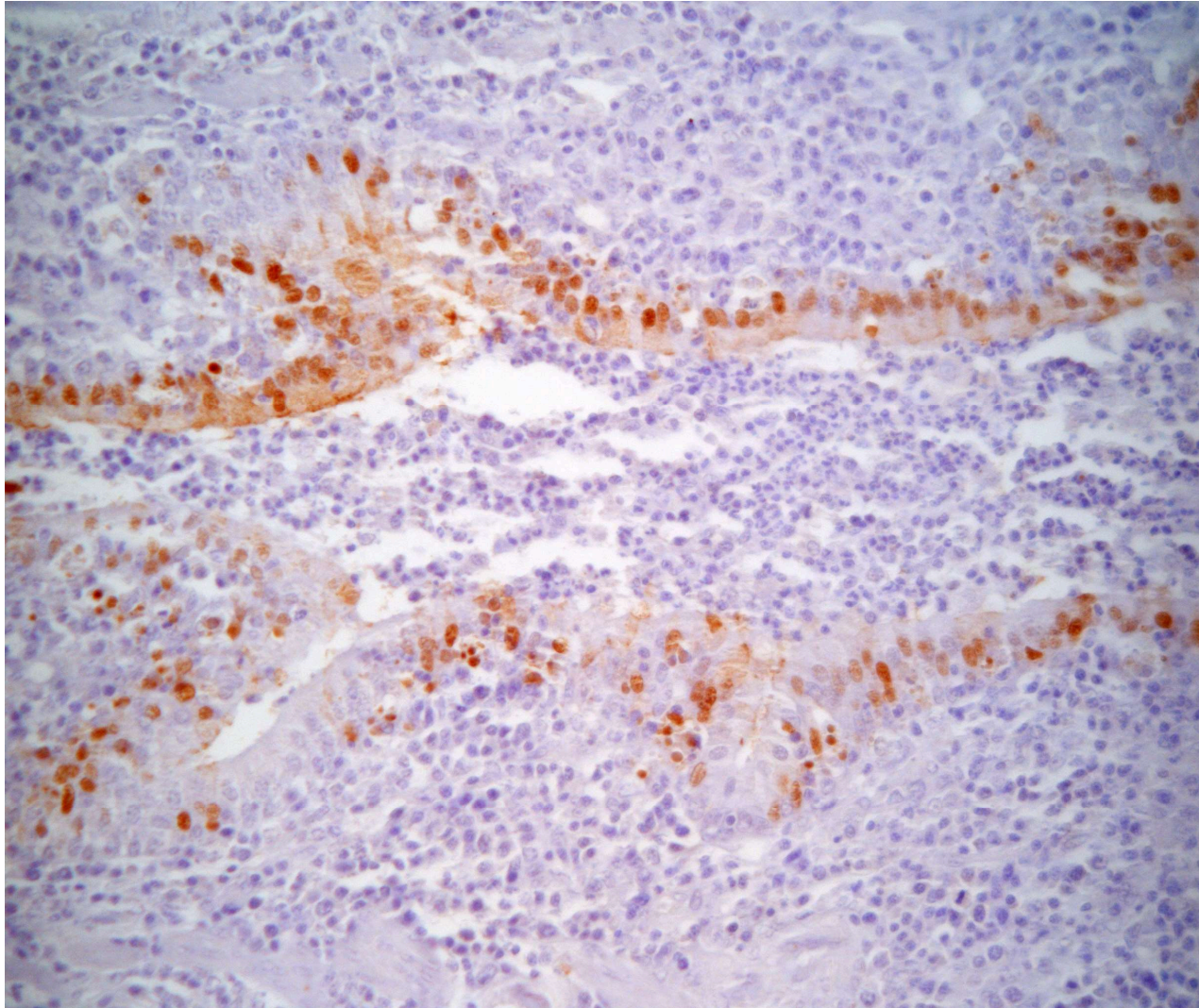


SIV



PRDC – Porcine Respiratory Disease Complex

Bronchiolite necrotizzante – IHC



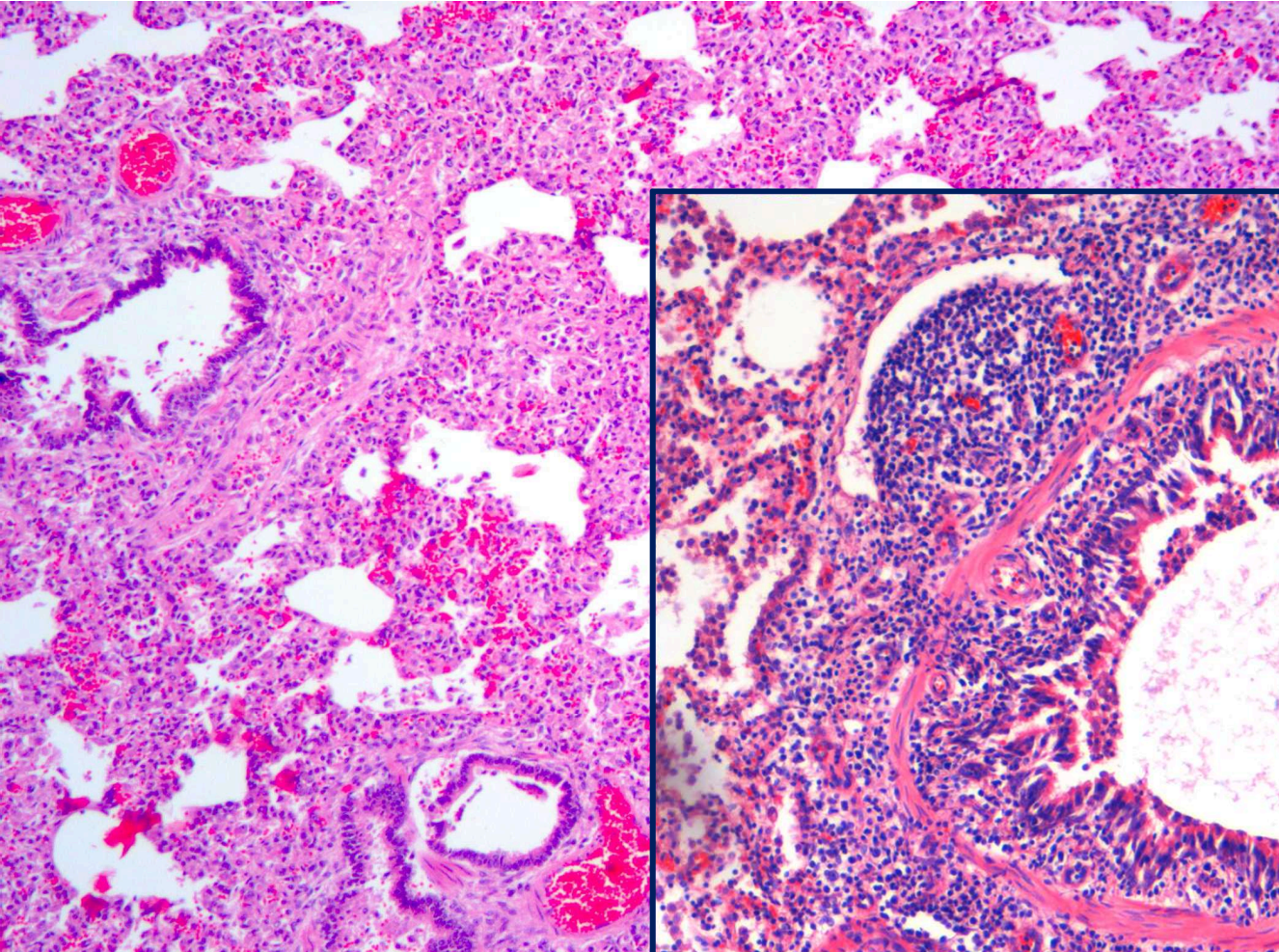
SIV

Positività
immunoistochimica
per la presenza
dell'antigene SIV
nelle cellule
dell'epitelio ciliato dei
bronchi

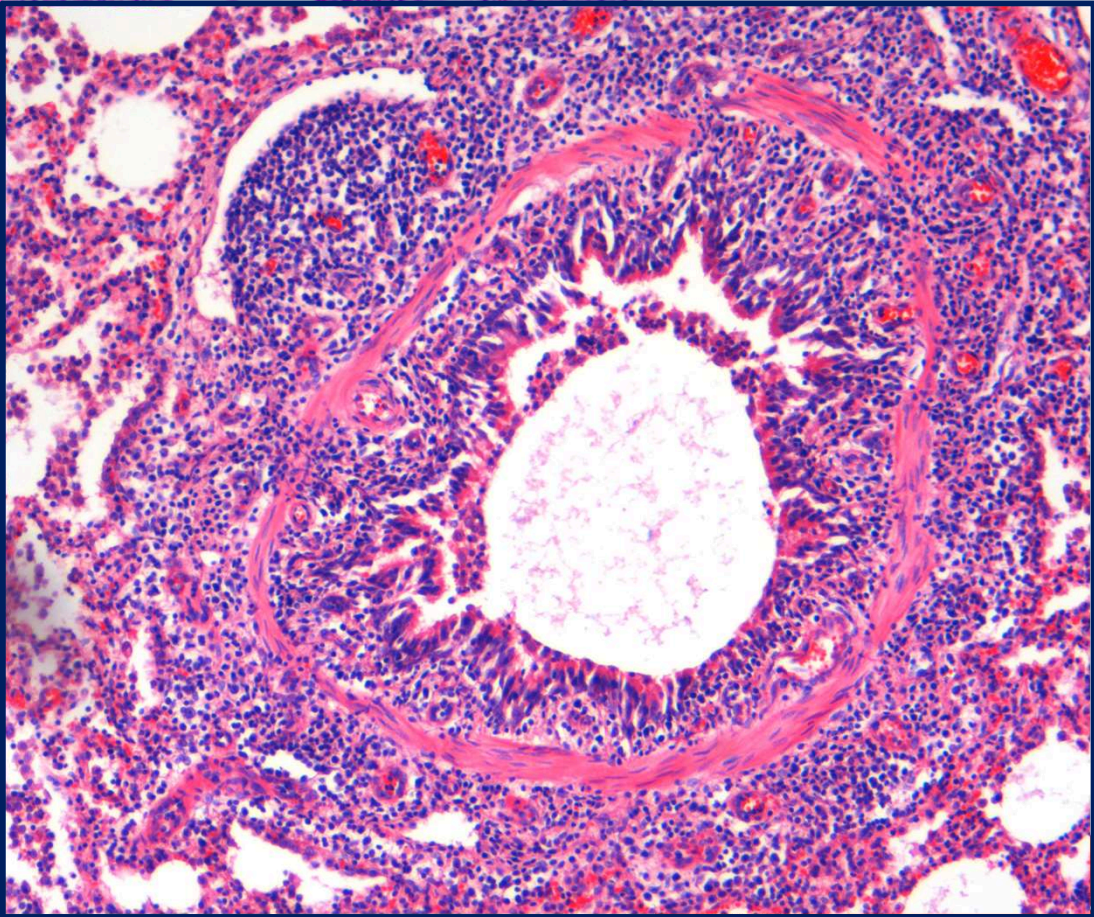


PRDC – Porcine Respiratory Disease Complex

Broncopolmonite (...)



Mycoplasma spp.



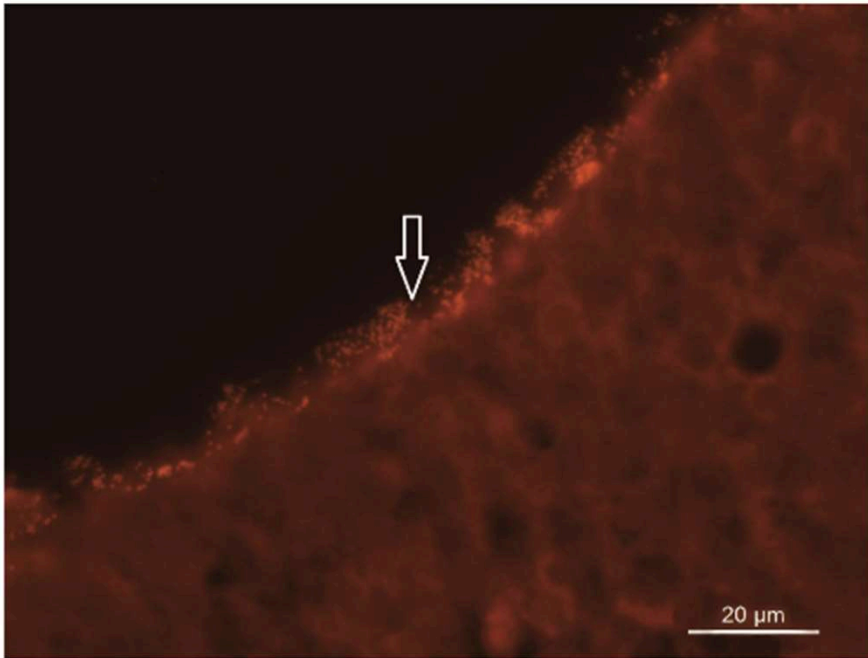


Fig.1. FISH, *Mycoplasma hyopneumoniae* labeling in the lung of pigs from group 1. Bronchus: The fluorescent signal on the epithelial surface (arrow) represents *M. hyopneumoniae* labeling. (CY3, 1000x).

Pereira, C. E., Vannucci, F. A., Gabardo, M. D. P., Santos, L. F. D., Mores, N., & Guedes, R. (2017). *Pesquisa Veterinária Brasileira*, 37(10), 1057-1063.

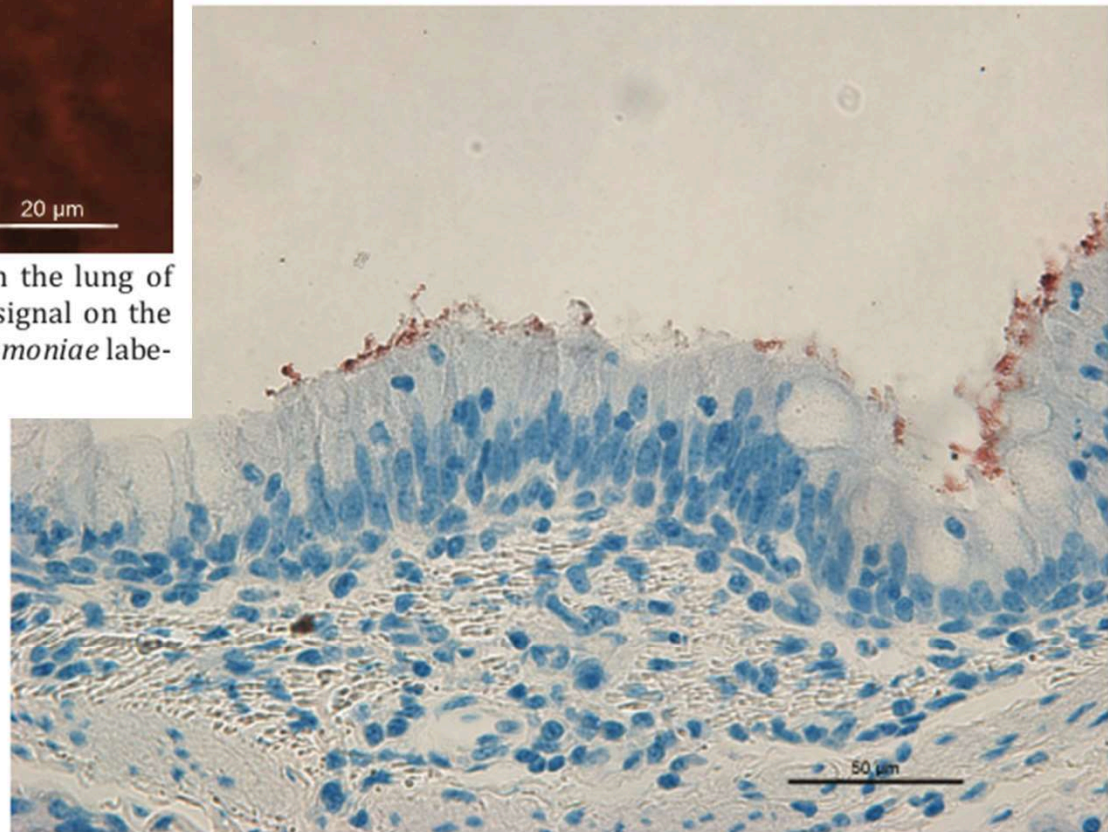


Fig.3. IHC, *Mycoplasma hyopneumoniae*, lung of pig. Group 1. Bronchus. Red immunostaining on the surface of the respiratory epithelium (AEC, hematoxylin, 400x).

PRDC – Porcine Respiratory Disease Complex

Pleuropolmonite contagiosa

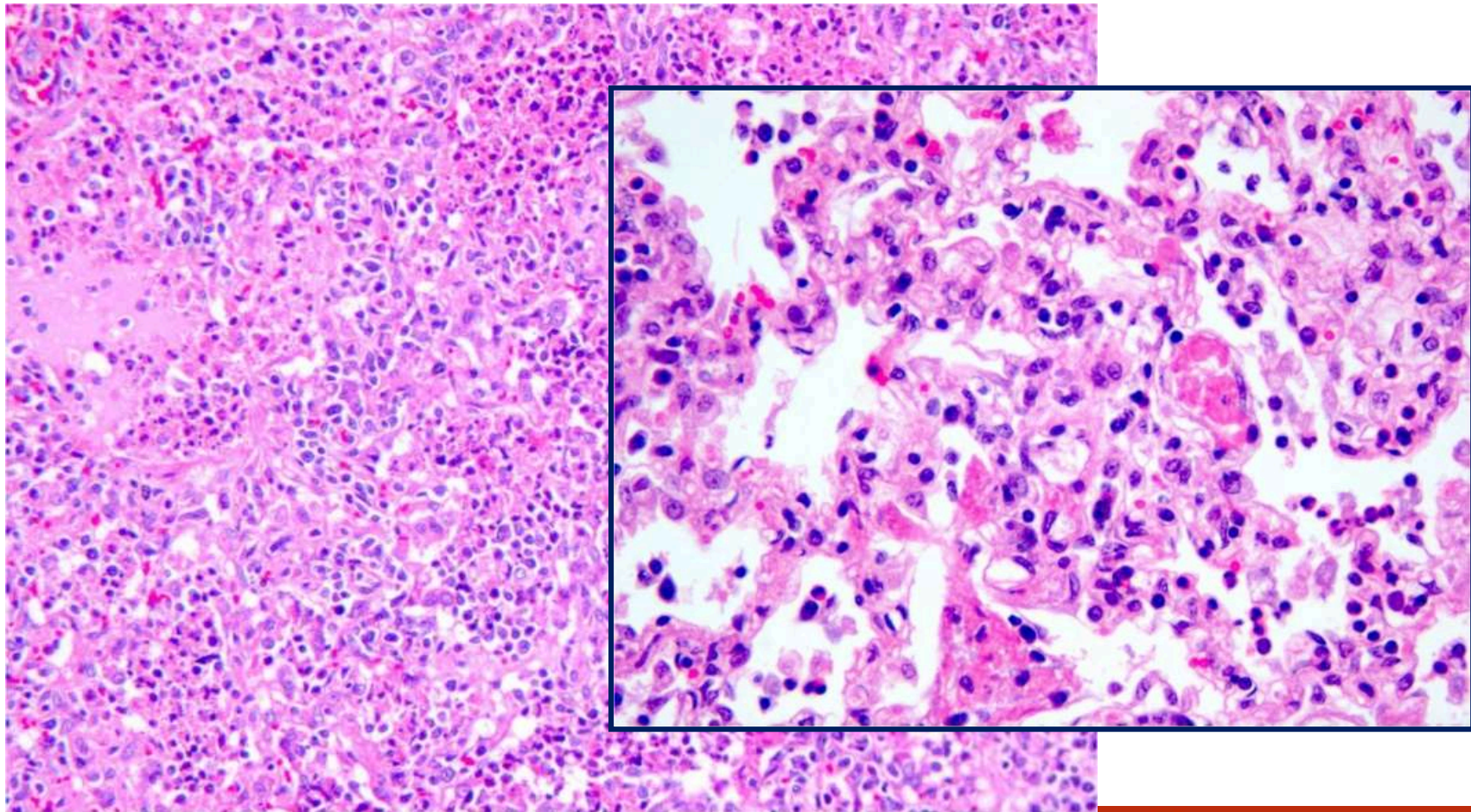
***Actinobacillus
pleuropneumoniae***



PRDC – Porcine Respiratory Disease Complex

Pleuropolmonite contagiosa

***Actinobacillus
pleuropneumoniae***



Patogeni dell'intestino

Table 15.1. Mechanisms of diarrhea

Infectious Insult	Primary Pathophysiological Mechanism of Diarrhea		
	Hypersecretion	Malabsorption	Inflammation
<i>E. coli</i>	+++	+	
<i>C. perfringens</i> type A	+		
<i>C. perfringens</i> type C		+	+++
<i>C. difficile</i> TGE	+	+	+++
Rotaviruses	+	++	
<i>Salmonella</i>	+		+++
<i>Lawsonia</i>		++	++
<i>Brachyspira</i>		+	++

Diseases of Swine, 2012



Le forme gastrointestinali da coronavirus

- Prototipo iniziale TGE
- Poi PED
- Futuro?
 - PDCoV
 - SADS-CoV



Available online at www.sciencedirect.com

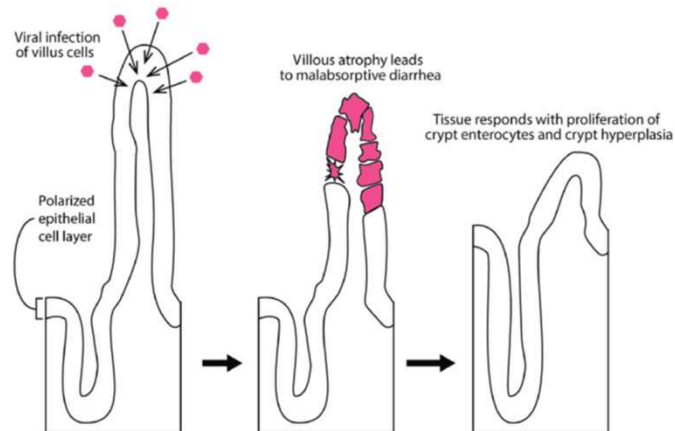
ScienceDirect

Emerging and re-emerging coronaviruses in pigs
QiuHong Wang, Anastasia N Vlasova, Scott P Kenney and
Linda J Saif

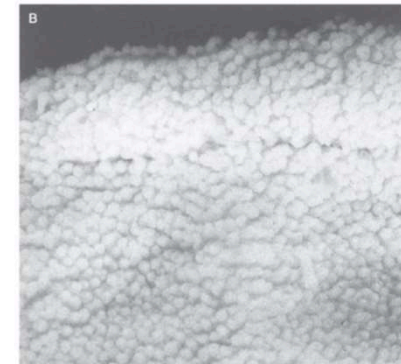
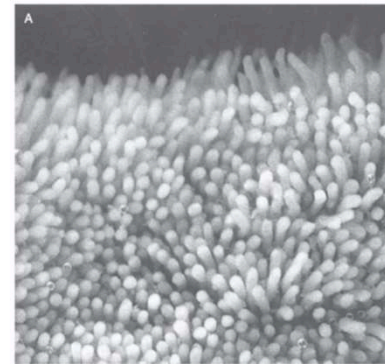
Current Opinion in
Virology



2019



Da: Fenner's Veterinary Virology. DOI: <http://dx.doi.org/10.1016/B978-0-12-800946-8.00024-6> - © 2017 Elsevier Inc.



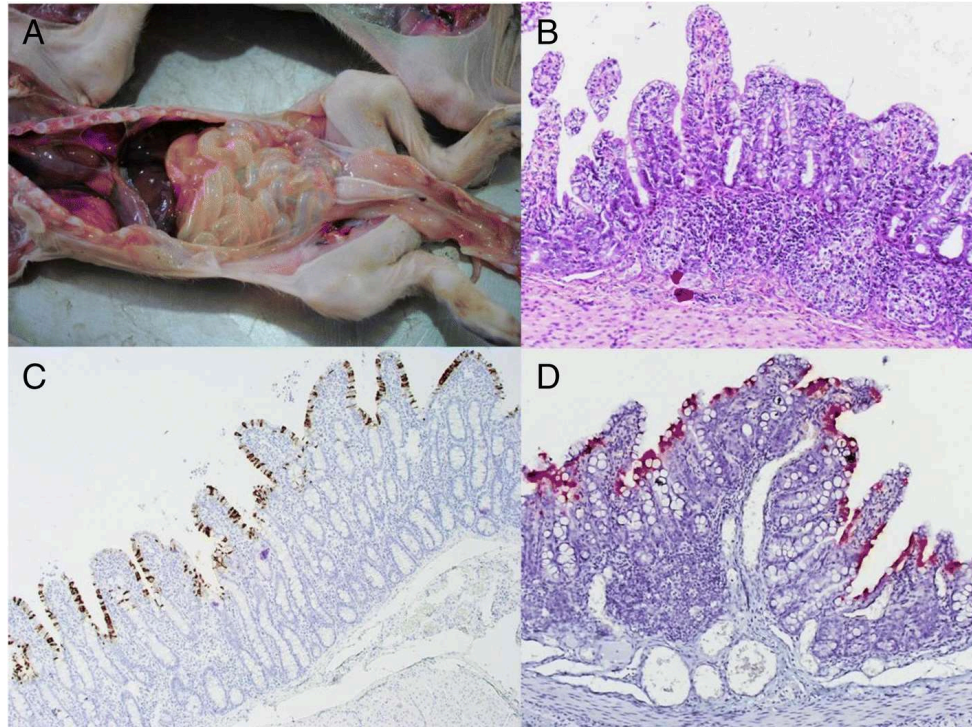
Da: Diseases of swine , 2012



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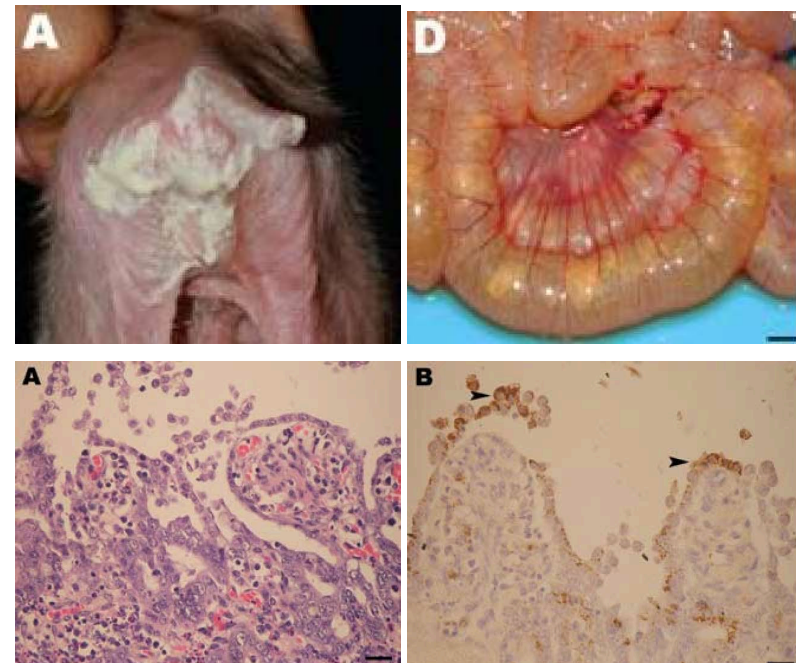
Le forme gastrointestinali da coronavirus

TGE



Da Piñeyro et al., (2018). <https://doi.org/10.1186/s12917-018-1615-9>

PED

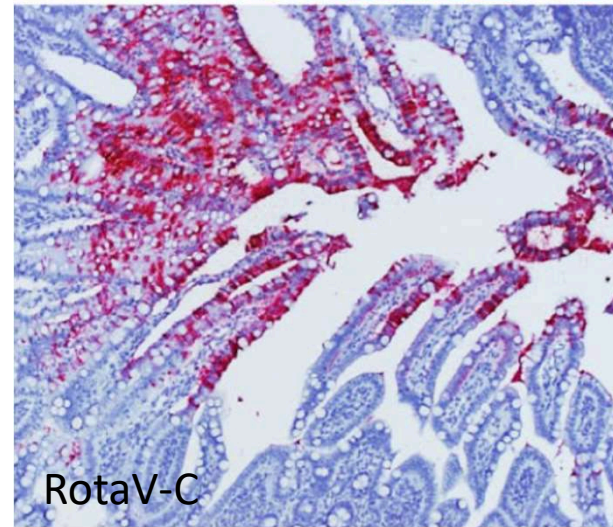
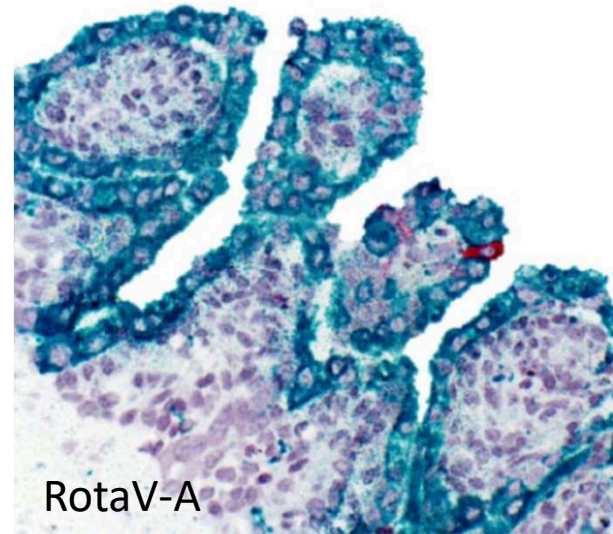
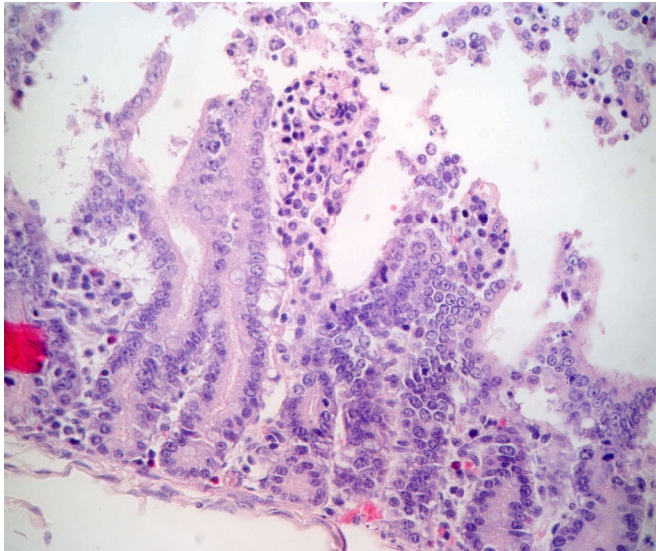
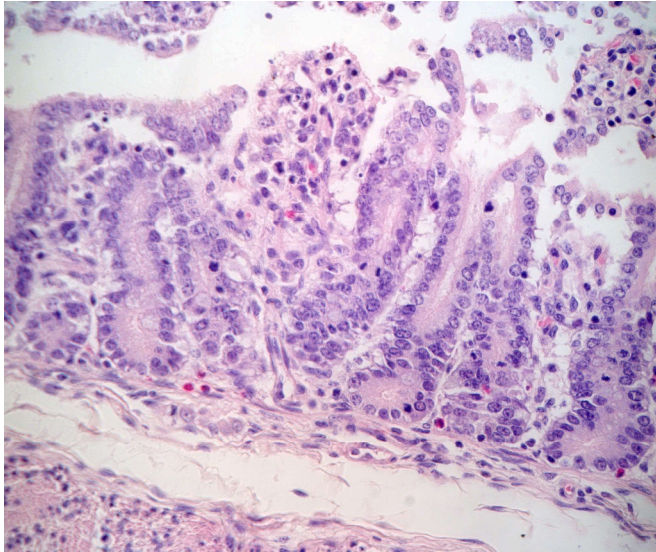


Da Puranaveja et al., 2009, DOI:[10.3201/eid1507.081256](https://doi.org/10.3201/eid1507.081256)



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I villi «nudi» nelle diarree da rotavirus

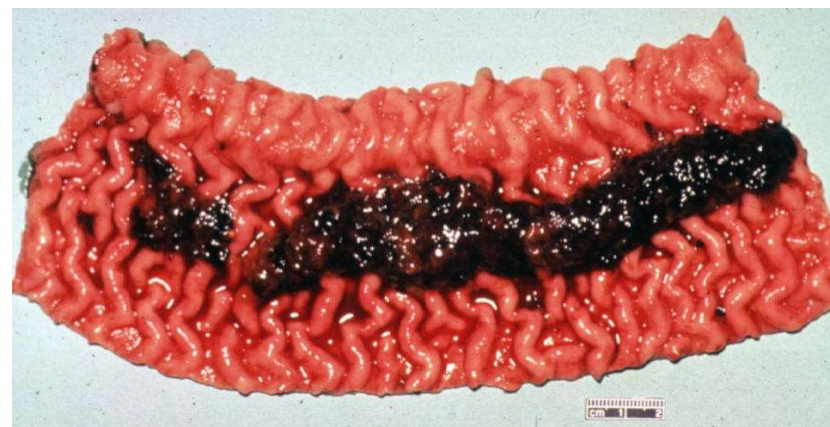
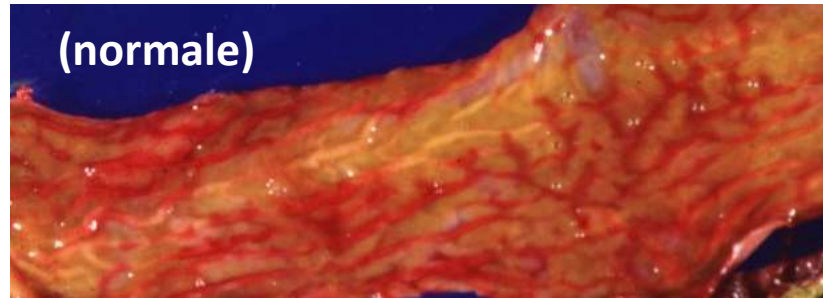


Resende et al., J Diagn. Invest., 2019

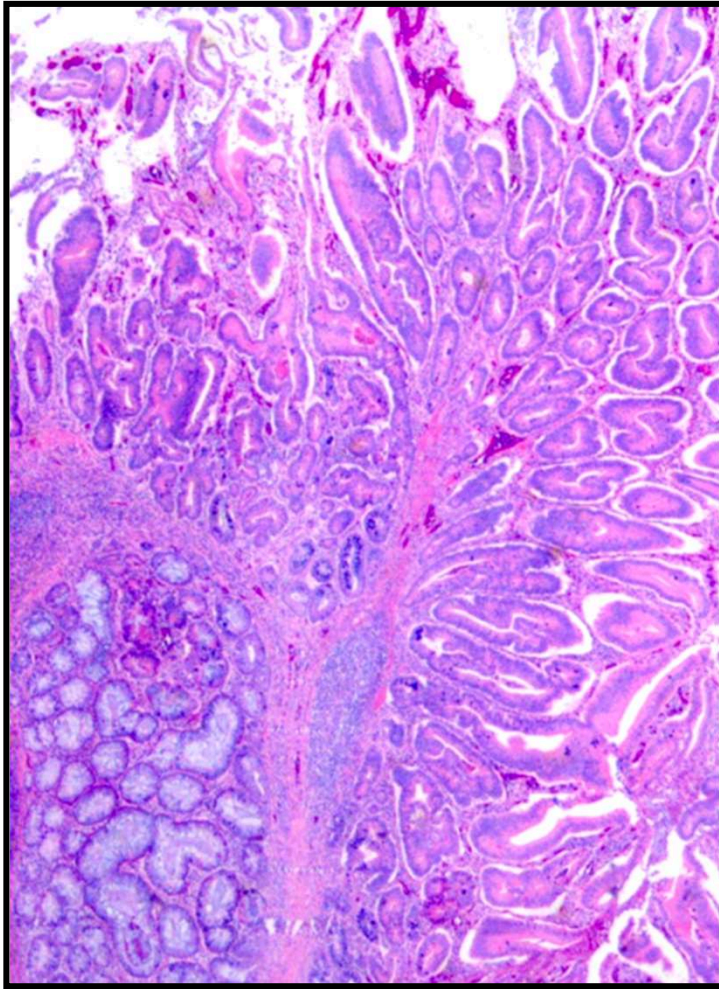


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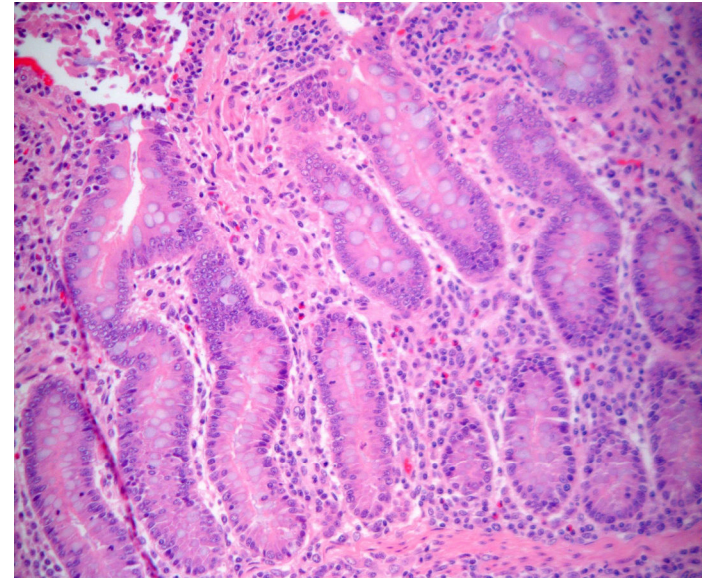
L'iperplasia, l'emorragia o la necrosi intestinale nelle enteriti da Lawsonia



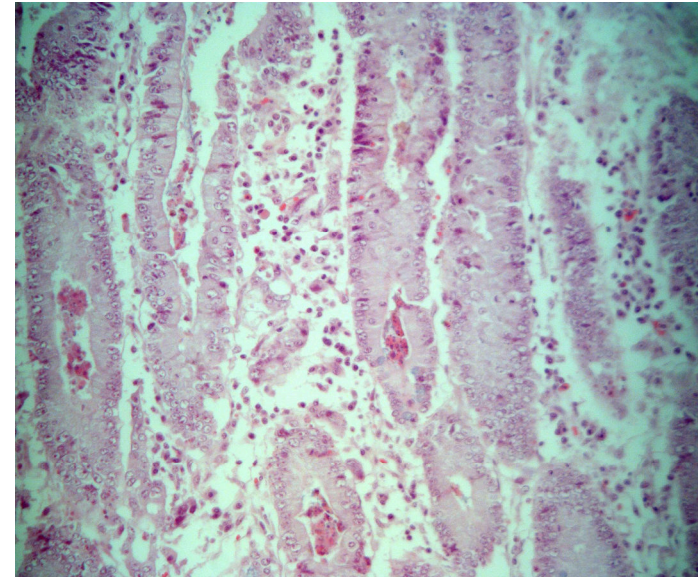
L'istologia è determinante?



Iperplasia



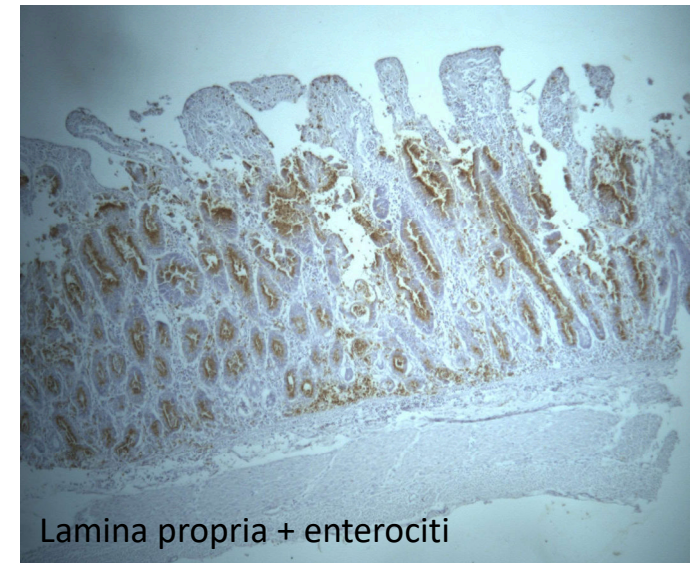
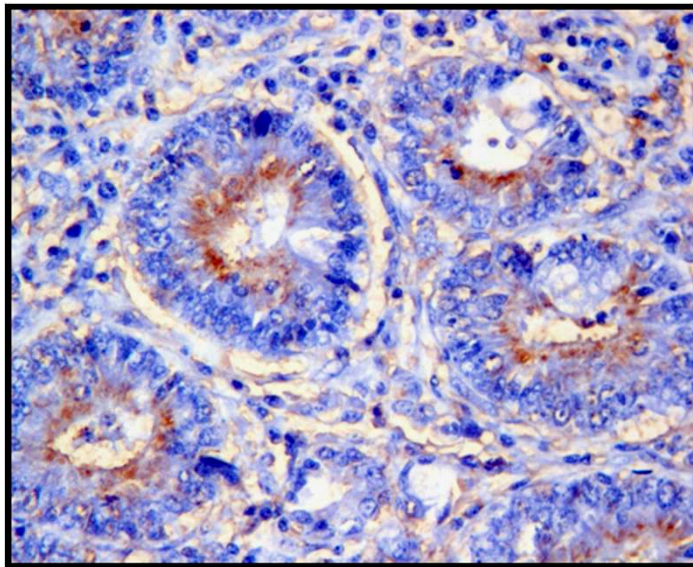
NO PIA = si mucipare



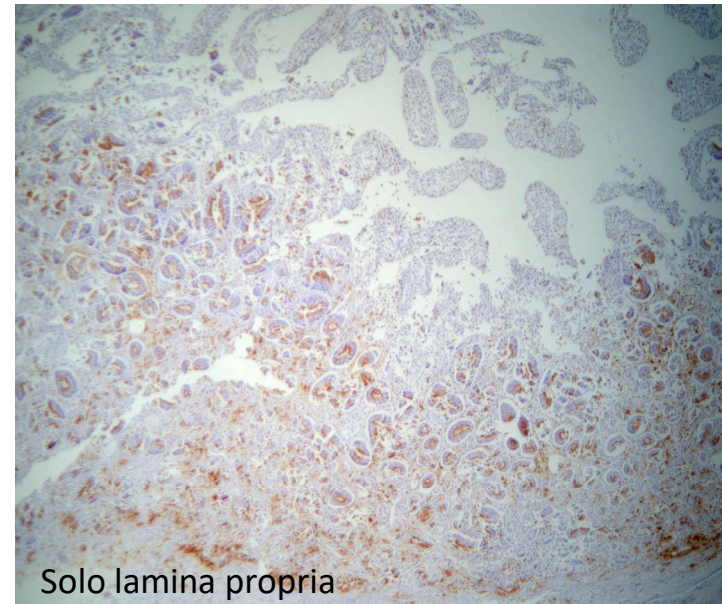
SI PIA = NO mucipare



Co-localizzazione lesione-agente eziologico



Lamina propria + enterociti



Solo lamina propria



Resta poi il problema delle dd
Attenzione: dd con enterite da Lawsonia o coinfezioni PCV2-Li

Patologia spontanea

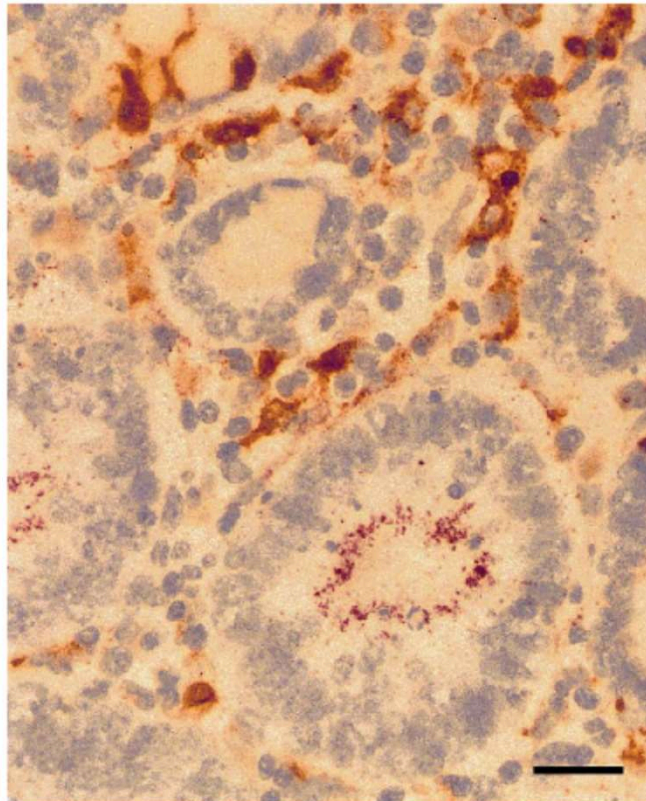


Fig. 4. Double immunolabelling for PCV2 antigen (brown) and *L. intracellularis* antigen (red) in ileum from a pig with a dual infection. *L. intracellularis* is seen within the crypt epithelium whereas PCV2 is demonstrated within macrophages in the adjacent lamina propria. IHC. Bar, 25 µm.

Jansen et al., JCP, 2006

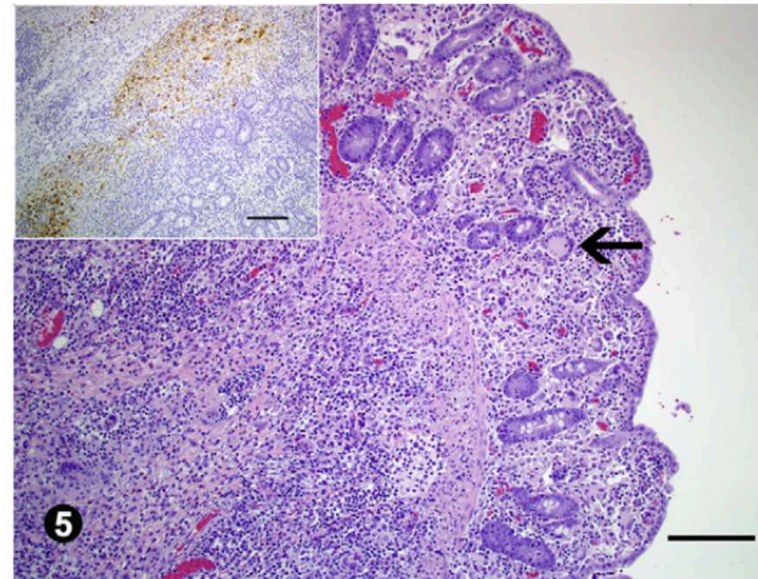


Fig. 5. Ileum of a pig inoculated with PCV2 28 days previously. There is marked depletion of Peyer's patches with occasional multinucleated giant cells. Villi are blunted and fused with histiocytic inflammation within the lamina propria. Multinucleated giant cells are also present within the lamina propria (arrow). HE. Bar, 200 µm. Inset: PCV2 IHC. There is marked labelling of Peyer's patches. Bar, 200 µm.

Oppriessnig et al., JCP, 2011

Patologia sperimentale



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PCVD-ED reale?

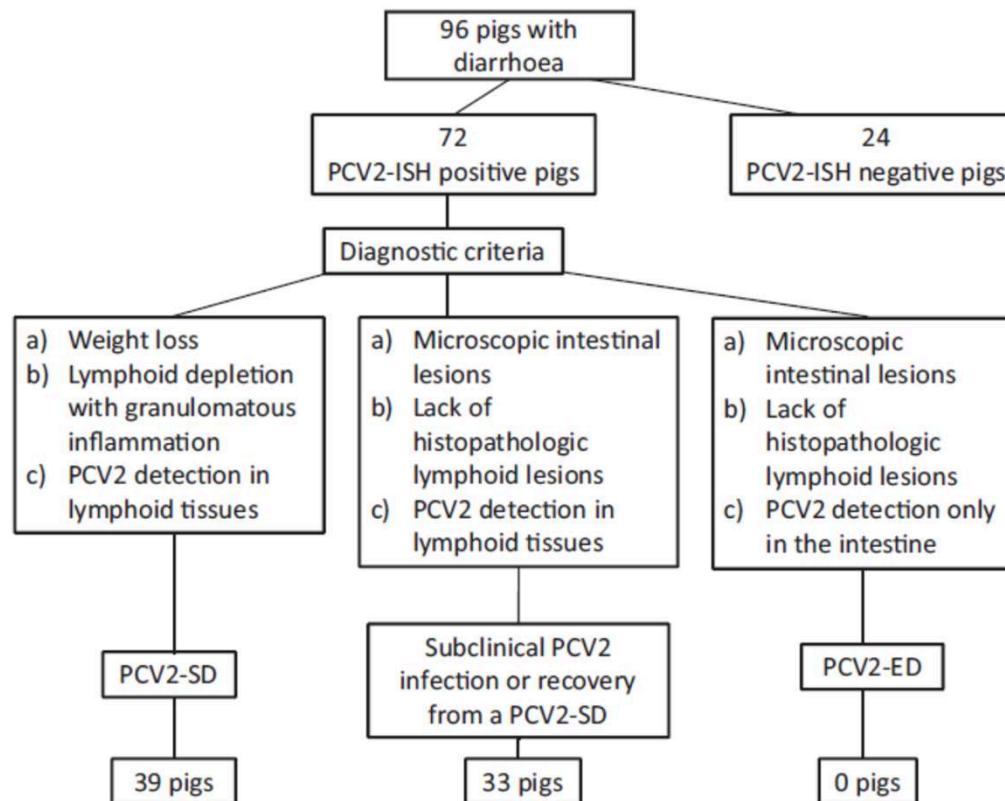
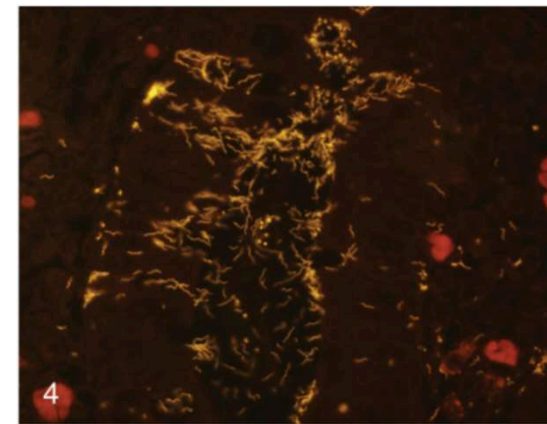
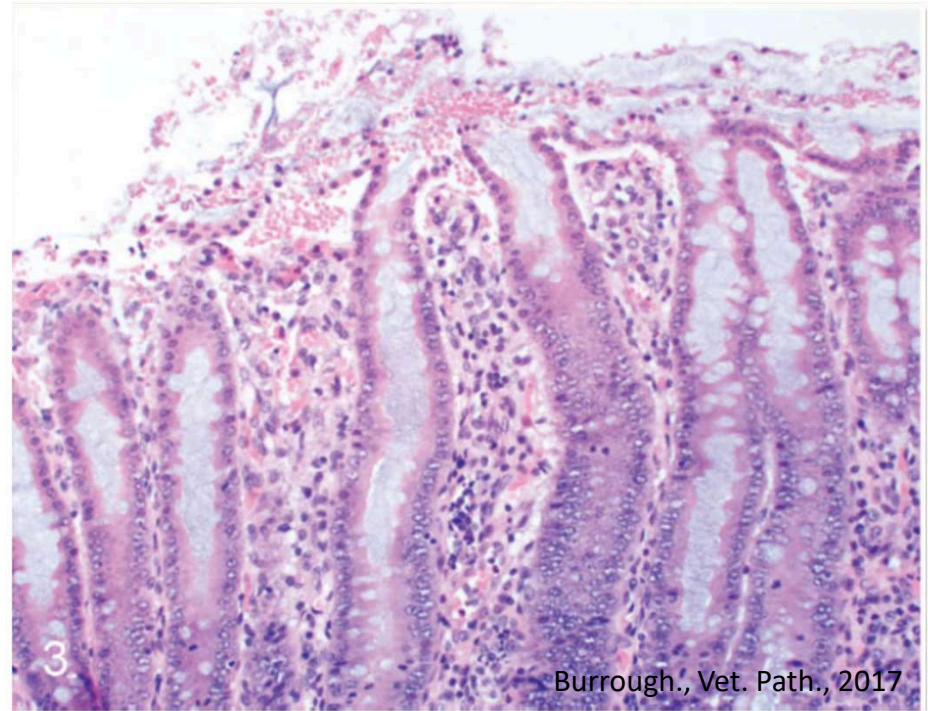
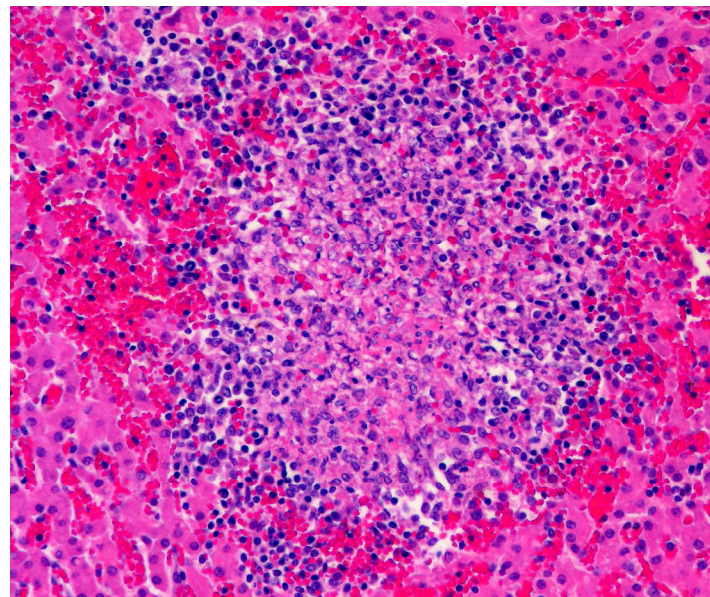
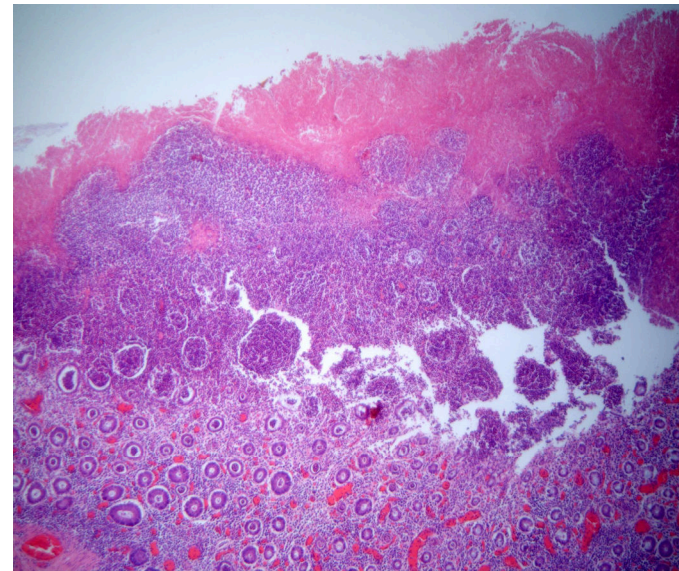


Fig. 1. Flow chart describing the selection and diagnostic criteria for PCV2 infected pigs included in this study. PCV2, porcine circovirus type 2; PCV2-SD, PCV2-systemic disease; PCV2-ED, PCV2-enteric disease.

Dissenteria suina



Comunque l'istologia aiuta quasi sempre



E' tutto sempre possibile?

- L'esame morfologico: si
- La lettura del vetrino: si
- La co-localizzazione?
 - Dipende dalla disponibilità del reagente primario (specifico)
 - Anticorpi per IHC
 - Sonde per ISH

Il decadimento del reagente primario nel tempo se un test non è richiesto rappresenta il limite, dettato da motivazioni economiche, all'offerta da parete dei laboratori



Take home messages

1. Il risultato dell'esame istologico è inficiato da un campione non idoneo: attenzione al materiale che si fissa!
2. Il risultato dipende dalla esperienza del patologo
3. Il valore aggiunto che l'esame istologico oggi può dare dipende dalla disponibilità di metodiche *in situ* che rendono più oggettivo il ruolo di un patogeno

