

1, 2, 3, 4... porcine circoviruses in front of our door!!

Joaquim Segalés

X @QuimSegales

joaquim.segales@uab.cat

UAB
Universitat Autònoma
de Barcelona

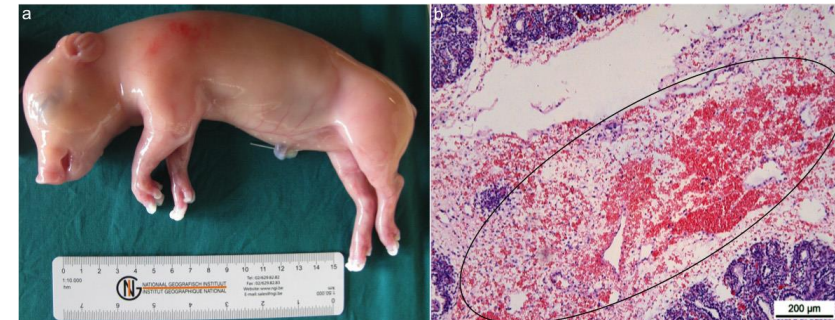
IRTA  **CReSA**
Centre de Recerca
en Sanitat Animal



World Organisation
for Animal Health
Founded as OIE

Porcine circovirus 1 (PCV-1)

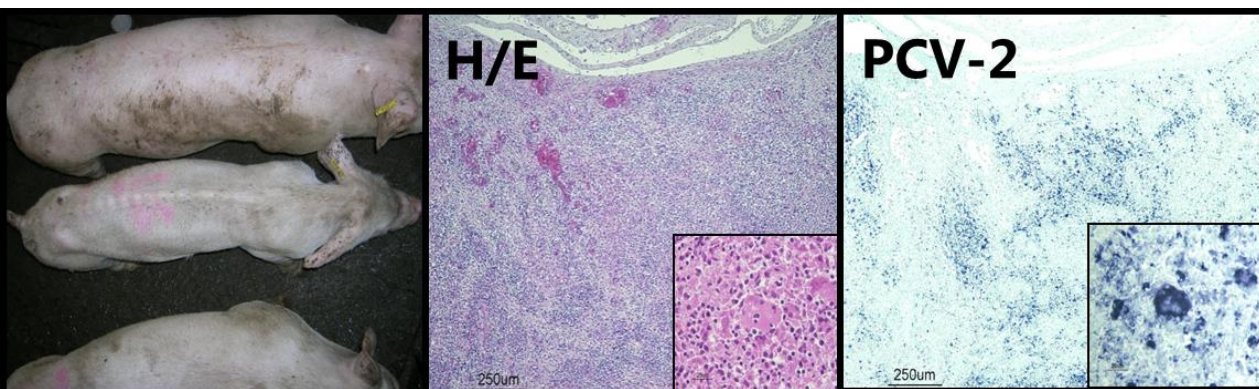
- Considered non-pathogenic for swine (Tisher et al., 1995; Allan et al., 1995)
- High antibody prevalence: 10-100% (Labarque et al., 2000; Puvanendiran et al., 2011)
- Found in subclinically infected pigs... but also in abortions and congenital tremor affected pigs... **association with reproductive failure?**
- Subsequently, congenital tremor type All was found associated with the atypical porcine pestivirus (APPV)
- Lung hemorrhages? (Saha et al., 2011)



Porcine circovirus 2 (PCV-2)



- Linked to disease since its first description (Harding, 1996; Clark, 1996) – **Postweaning multisystemic wasting syndrome (PMWS)**
- Hot debate regarding “causality” of PMWS by PCV-2
- PCV-2 vaccines closed the debate: very efficient to counteract PMWS (**systemic disease, PCV-2-SD**)
- PCV-2 associated also to other disease conditions:
 - Reproductive disease (PCV-2-RD)
 - Porcine dermatitis and nephropathy syndrome (PDNS)



Porcine circovirus 3 (PCV-3)

- Discovered by means of metagenomics (“deep sequencing”) from reproductive failure, PDNS and cardiac/systemic inflammation cases (Palinski et al., 2016; Phan et al., 2016)
- Found in diseased animals, but also in healthy ones... **is PCV-3 an important pathogen of swine?**

Phan et al. *Virology Journal* (2016) 13:184
DOI 10.1186/s12985-016-0642-z

Virology Journal

SHORT REPORT

Open Access



Detection of a novel circovirus PCV3 in pigs with cardiac and multi-systemic inflammation

Tung Gia Phan^{1,2}, Federico Giannitti^{3,4}, Stephanie Rossow³, Douglas Marthaler³, Todd Knutson³, Linlin Li^{1,2}, Xutao Deng¹, Talita Resende³, Fabio Vannucci³ and Eric Delwart^{1,2*}



PCV3

A Novel Porcine Circovirus Distantly Related to Known Circoviruses Is Associated with Porcine Dermatitis and Nephropathy Syndrome and Reproductive Failure

Rachel Palinski,^a Pablo Piñeyro,^b Pengcheng Shang,^a Fangfeng Yuan,^a Rui Guo,^a Ying Fang,^a Emily Byers,^c Ben M. Hause^{a,d}

Department of Diagnostic Medicine and Pathobiology, Kansas State University, Manhattan, Kansas, USA^a; College of Veterinary Medicine, Iowa State University, Ames, Iowa, USA^b; Smithfield Hog Production, Warsaw, North Carolina, USA^c; Kansas State Veterinary Diagnostic Laboratory, Kansas State University, Manhattan, Kansas, USA^d

Porcine circovirus 4 (PCV-4)

Novel circovirus species identified in farmed pigs designated as *Porcine circovirus 4*, Hunan province, China

Hui-Hui Zhang¹ | Wen-Qin Hu¹ | Jie-Yu Li¹ | Tian-Ning Liu¹ | Ji-Yong Zhou² |
Tanja Opriessnig³ | Chao-Ting Xiao¹ 

overall PCV4 prevalence of 12.8%, with the highest positive rates in nasal swabs (28.5%, 6/21) followed by serum samples (13.4%, 11/82). The clinical significance and pathogenesis of this virus needs further investigation.

Since then diagnosed also in Thailand, Malaysia and South Korea... and...