

# 11<sup>th</sup> International Virology Summit

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### **Concurrent swine influenza A virus type H1N1 and porcine circovirus type 2b (PCV2b) infection in caesarean-derived and colostrum-deprived (CD/CD) pigs**

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Porcine circovirus type 2 (PCV2) and influenza A virus (IAV) are important pathogens in the swine industry, with economic significance to pork producers worldwide. The pathogenesis of PCV2/IAV co-infection and any synergistic effects between these two viruses is unknown. The objectives of this research were to determine 1) if IAV (H1N1) infection could initiate clinically significant porcine circovirus associated respiratory disease (PCVAD-respiratory) in pigs subclinically infected with PCV2b; and 2) if pre-existing, subclinical PCV2b infection affected the duration and severity of a subsequent IAV (H1N1) infection. When compared to pigs infected with IAV or PCV2b alone, dual-infected pigs (PCV2b+IAV (H1N1)) had more severe clinical respiratory signs (increased respiratory effort, cough) which persisted longer; had an increased number of IAV genomic copies shed in nasal secretions and the duration of shedding was prolonged and had increased levels of PCV2b in serum for approximately 10 days following IAV inoculation. Two (of 10) dual-infected pigs developed clinical signs and lesions of severe PCVAD, including wasting, marked pulmonary disease with pleural and peritoneal effusion and diffuse lymphadenopathy. PCV2b only-infected pigs had reduced body weight and decreased average daily gain. Based on these results, we conclude that, under the conditions of this study, IAV infection in pigs subclinically infected with PCV2b, results in increased shedding (both amount and duration) of IAV; a transient increase in circulating PCV2; and induction of severe, clinical signs and lesions of PCVAD in 20% of PCV2b-infected pigs. Influenza virus should be considered as another contributing factor for PCVAD when the IAV infection occurs in pigs subclinically infected with PCV2b.

#### **Recent Publications**

1. Guo B, Kim H, Zheng Y, Shen H, Pogranichniy R M, Schwartz K J, Li G and Yoon K J (2018) Genomic sequence of a swine parvovirus Type 1 strain identified in US swine. *Genome Announc.* 6(6) pii: e01569-17.
2. Cheung A K, Ng T F, Lager K M, Alt D P, Delwart E and Pogranichniy R M (2015) Identification of several clades of novel single-stranded circular DNA viruses with conserved stem-loop structures in pig feces. *Arch Virol.* 160(1):353-358.
3. Cheung A K, Ng T F, Lager K M, Alt D P, Delwart E L and Pogranichniy R M (2014) Unique circovirus-like genome detected in pig feces. *Genome Announc.* 2(2):pii:e00251-14.
4. Cheung A K, Ng T F, Lager K M, Alt D P, Delwart E L and Pogranichniy R M (2014) Identification of a novel single-stranded circular DNA virus in pig feces. *Genome Announc.* 2(2):e00347-14..
5. Wei H, Lenz S D, Thompson D H and Pogranichniy R M (2014) DNA-epitope vaccine provided efficient protection to mice against lethal dose of influenza A virus H1N1. *Viral Immunol.* 27(1):14-19.

#### **Biography**

Roman Pogranichniy completed his PhD in 2005 at Iowa State University. He worked as an Assistant Professor of Virology from 2005 to 2010 in Animal Disease Diagnostic Laboratory, School of Veterinary Medicine, Purdue University. He worked as an Associate Professor of Virology from 2010 to 2016 in Animal Disease Diagnostic Laboratory, College of Veterinary Medicine, Purdue University. He is working as Associate Professor of Virology from 2016 to present in the Department of Comparative Pathobiology, College of Veterinary Medicine, Purdue University.

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