

## D. PUBLICATIONS ISSUED OR “IN PRESS”

### 1) Refereed publications

- Abrahante JE, Zhang JW, Rossow K, Zimmerman JJ, Murtaugh MP. 2014. Surveillance of porcine pestivirus (Bungowannah) in the upper Midwestern USA. *Transbound Emerg Dis* 60:375-377.
- Abrahante JE, Zhang JW, Rossow K, Zimmerman JJ, Murtaugh MP. 2014. Surveillance of Bungowannah pestivirus in the upper Midwestern USA. *Transbound Emerg Dis*. 61:375-7.
- Alonso C, Goede DP, Morrison RB, Davies PR, Rovira A, Marthaler DG, Torremorell M. 2014. Evidence of infectivity of airborne porcine epidemic diarrhea virus and detection of airborne viral RNA at long distances from infected herds. *Vet Res*. 45:73.
- Anderson TK, Nelson MI, Kitikoon P, Swenson SL, Korlund JA, Vincent AL. 2013. Population dynamics of cocirculating swine influenza A viruses in the United States from 2009 to 2012. *Influenza Other Respir Viruses* 7 Suppl 4:42-51.
- Archambault, D., U.B.R. Balasuriya, R.R.R. Raymond, H. Yang, and D. Yoo. 2014. Animal Arterivirus Infections (Editorial). *BioMed Res. Intl. (Special Issue of Animal Arterivirus Infection)*. Vol. 2014, Article ID 303841, 2 pages. <http://dx.doi.org/10.1155/2014/303841>.
- Binjawadagi B, V. Dwivedi, C. Manickam, K. Ouyang, J.B. Torrelles and G.J. Renukaradhya\* (2014). An innovative approach to induce cross-protective immunity against porcine reproductive and respiratory syndrome virus in the lungs of pigs through adjuvanted nanotechnology based vaccination. *International Journal of Nanomedicine*, 9:1519-1535. PMID: 24711701
- Binjawadagi B, V. Dwivedi, C. Manickam, K. Ouyang, Y. Wu, J. Lee, J.B. Torrelles and G.J. Renukaradhya\* (2014). Adjuvanted nanoparticle-entrapped inactivated porcine reproductive and respiratory syndrome virus vaccine elicits better cross-protective response in pigs. *International Journal of Nanomedicine*, 9:679-694. PMID: 24493925
- Boddicker N, Bjorquist A, Rowland RRR, Lunney JK, Reecy JM, Dekkers JCM. 2013. Genome-wide association and genomic prediction for host response to Porcine Reproductive and Respiratory Syndrome infection. *Genetics Selection Evolution*. 46:18.
- Boddicker N, Garrick DJ, Rowland RRR, Lunney JK, Reecy JM, Dekkers JCM. 2013. Validation of a major quantitative trait locus associated with host response to experimental infection with Porcine Reproductive and Respiratory Syndrome virus. *Animal Genetics*. 45: 48-58.
- Boddicker NJ, Bjorkquist A, Rowland RR, Lunney JK, Reecy JM, Dekkers JC. 2014. Genome-wide association and genomic prediction for host response to porcine reproductive and respiratory syndrome virus infection. *Genet Sel Evol*. 46:18.
- Boddicker, NJ, DJ Garrick, RRR Rowland, JK Lunney, JM Reecy, JCM Dekkers. 2014. Validation and further characterization of a major quantitative trait locus associated with host response to experimental infection with porcine reproductive and respiratory syndrome virus. *Anim Genet*. 45:48-58.

- Brockmeier SL, Register KB, Kuehn JS, Nicholson TL, Loving CL, Bayles DO, Shore SM, Phillips GJ. 2014. Virulence and draft genome sequence overview of multiple strains of the swine pathogen *Haemophilus parasuis*. *PLoS One* 9:e103787.
- Buehler J, Lager K, Vincent A, Miller C, Thacker E, Janke B. 2014. Issues encountered in development of enzyme-linked immunosorbent assay for use in detecting Influenza A virus subtype H5N1 exposure in swine. *J. Vet. Diagn. Invest.* 26:277-281.
- Butler J, K. M. Lager, W. Golde, K. S. Faaberg, M. Sinkora, C. Loving, and Y. Zhang: Porcine reproductive and respiratory syndrome (PRRS): an immune dysregulatory pandemic. *Immunologic Research.* 2014 Aug;59(1-3):81-108. doi: 10.1007/s12026-014-8549-5. Published online on July 1, 2014.
- Butler JE, Lager KM, Golde W, Faaberg KS, Sinkora M, Loving C, Zhang YI. 2014. Porcine reproductive and respiratory syndrome (PRRS): an immune dysregulatory pandemic. *Immunol. Res.* 59:81-108.
- Byrd-Leotis L, Liu R, Bradley KC, Lasanajak Y, Cummings SF, Song X, Heimburg-Molinario J, Galloway SE, Culhane MR, Smith DF, Steinhauer DA, Cummings RD. 2014. Shotgun glycomics of pig lung identifies natural endogenous receptors for influenza viruses. *Proc Natl Acad Sci U S A.* 111:E2241-50.
- Chen Q, Li G, Stasko J, Thomas JT, Stensland WR, Pillatzki AE, Gauger PC, Schwartz KJ, Madson DM, Yoon KJ, Stevenson GW, Burrough ER, Harmon KM, Main RG, Zhang J. 2014. Isolation and characterization of porcine epidemic diarrhea viruses associated with the 2013 disease outbreak in US swine. *J Clin Microbiol* 52:234-243.
- Chen, Z., Li, M., He, Q., Du, J., Zhou, L., Ge, X., Guo, X., Yang, H., 2014. The amino acid at residue 155 in nonstructural protein 4 of porcine reproductive and respiratory syndrome virus contributes to its inhibitory effect for interferon-beta transcription in vitro. *Virus research* 189, 226-234.
- Cheung AK, Ng TF, Lager KM, Alt DP, Delwart E, Pogranichniy RM. 2014. Identification of several clades of novel single-stranded circular DNA viruses with conserved stem-loop structures in pig feces. *Arch. Virol.*
- Cheung AK, Ng TF, Lager KM, Alt DP, Delwart E, Pogranichniy RM. Identification of several clades of novel single-stranded circular DNA viruses with conserved stem-loop structures in pig feces. *Arch Virol.* 2014
- Cheung AK, Ng TF, Lager KM, Alt DP, Delwart EL, Pogranichniy RM. 2014. Identification of a novel single-stranded circular DNA virus in pig feces. *Genome Announc* 2.
- Choi I, Bao H, Kommadath A, Hosseini A, Sun X, Meng Y, Stothard P, Plastow GS, Tuggle CK, Reecy JM, Fritz E, Abrams SM, Lunney JK, Guan LL. 2014. Increasing gene discovery and coverage using RNA-seq of globin RNA reduced porcine blood samples. *BMC Genomics.* 15: 954.
- Clavijo MJ, Oliveira S, Zimmerman J, Rendahl A, Rovira A. 2014. Field evaluation of a quantitative polymerase chain reaction assay for *Mycoplasma hyorhinis*. *J Vet Diagn Invest.* 26:755-60.
- Culhane MR, Detmer SE. 2014. Sample types, collection, and transport for influenza A viruses of swine. *Methods Mol Biol.* 1161:259-63.
- Cutler TD, Wang C, Hoff SJ, Zimmerman JJ. 2013. A method to quantify infectious airborne pathogens at concentrations below the threshold of quantification by culture. *Can J Vet Res* 77:95-99.

- Deaton MK, Spear A, Faaberg KS, Pegan SD. 2014. The vOTU domain of highly-pathogenic porcine reproductive and respiratory syndrome virus displays a differential substrate preference. *Virology* 454-455:247-253.
- Dee S, T. Clement, A. Schelkopf, J. Nerem, D. Knudsen, J. Hennings, E. Nelson. 2014. An evaluation of contaminated complete feed as a vehicle for porcine epidemic diarrhea virus infection of naïve pigs following consumption via natural feeding behavior: Proof of concept. *BMC Veterinary Research*, 10:176.
- Dee, S., C. Neill, T. Clement, J. Christopher-Hennings, E. Nelson. 2014. An evaluation of a liquid antimicrobial (Sal CURB®) for reducing the risk of porcine epidemic diarrhea virus infection of naïve pigs during consumption of contaminated feed. *BMC Veterinary Research*, 10:220
- Dong, J., Zhang, N., Ge, X., Zhou, L., Guo, X., Yang, H., 2014. The interaction of nonstructural protein 9 with retinoblastoma protein benefits the replication of genotype 2 porcine reproductive and respiratory syndrome virus in vitro. *Virology* 464-465, 432-440.
- Du, Y., J. Bi, J. Liu, X. Liu, X. Wu, P. Jiang, D. Yoo, Y. Zhang, J. Wu, R. Wan, X. Zhao, L. Guo, W. Sun, X. Cong, L. Chen, and J. Wang. 2014. 3Cpro of FMDV antagonizes IFN signaling pathway by blocking STAT1/STAT2 nuclear translocation. *J. Virol.* 88:4908-4920.
- Feng Z, Gomez J, Bowman AS, Ye J, Long L-P, Nelson SW, Yang J, Martin B, Jia K, Nolting J, Cunningham F, Cardona C, Zhang J, Yoon KJ, Slemons RD, Wan X-F. 2013. Antigenic characterization of H3N2 influenza A viruses from Ohio agricultural fairs. *J Virol* 87:7655-7667.
- Fox JM, Sage LK, Poore S, Johnson S, Tompkins SM, Tripp RA. Drug analog inhibition of indoleamine 2,3-dioxygenase (IDO) activity modifies pattern recognition receptor expression and proinflammatory cytokine responses early during influenza virus infection. *J Leukoc Biol.* 2014 Sep;96(3):447-52. doi: 10.1189/jlb.3AB0114-046RR. Epub 2014 May 5. PMID: 24799604.
- Gabbard, J., Dlugolenski, D., van Riel, D., Marshall, N., Galloway, S., Howerth, E., Campbell, P., Jones, C., Johnson, S., Byrd-Leotis, L., Steinhauer, D., Kuiken, T., Tompkins, S.M., Tripp, R., Lowen, A., and J. Steel. 2014 Novel H7N9 influenza virus shows low infectious dose, high growth and efficient contact transmission in the guinea pig model. *J Virol.* 2014 Feb;88(3):1502-12. doi: 10.1128/JVI.02959-13. Epub 2013 Nov 13. PMID: 24227867
- Gauger PC, Loving CL, Kuhrana S, Lorusso A, Perez DR, Kehrli ME, Roth JA, Golding H, Vincent AL. 2014. Live attenuated influenza A virus vaccine protects against A(H1N1)pdm09 heterologous challenge without vaccine-associated enhanced respiratory disease. *Virology* 471-473:93–104.
- Gauger PC, Loving CL, Lager KM, Janke BH, Kehrli ME, Jr., Roth JA, Vincent AL. 2013. Vaccine-associated enhanced respiratory disease does not interfere with the adaptive immune response following challenge with pandemic A/H1N1 2009. *Viral Immunol.* 26:314-321.
- Gauger PC, Loving CL, Vincent AL. 2014. Enzyme-linked immunosorbent assay for detection of serum or mucosal isotype-specific IgG and IgA whole-virus antibody to influenza A virus in swine. *Methods Mol. Biol.* 1161:303-312.
- Gauger PC, Vincent AL, Loving CL, Lager KM, Janke BH, Kehrli ME, Roth JA. 2013. Vaccine-associated enhanced respiratory disease does not interfere with the adaptive

immune response following challenge with pandemic A/H1N1 2009. *Viral Immunol* 26:1-8.

- Gauger PC, Vincent AL. 2014. Serum virus neutralization assay for detection and quantitation of serum-neutralizing antibodies to influenza A virus in swine. *Methods Mol. Biol.* 1161:313-324.
- Gerber PF, Gong Q, Huang Y-W, Wang C, Holtkamp D, Opriessnig T. 2014. Detection of antibodies against porcine epidemic diarrhea virus in serum and colostrum by indirect ELISA. *Vet J* (in press). DOI:10.1016/j.tvjl.2014.07.018
- Gerber PF, L.G. Giménez-Lirola, P.G. Halbur, L. Zhou, X.J. Meng, Y. Fang, and T. Opriessnig. 2014. Comparison of commercial enzyme-linked immunosorbent assays and fluorescent microbead immunoassays for detection of antibodies against porcine reproductive and respiratory syndrome virus in boars. *Journal of Virological Methods.* 197:63-66.
- Gerber PF, O'Neill K, Owolodun O, Wang C, Harmon K, Zhang J, Halbur PG, Zhou L, Meng X-J, Opriessnig T. 2013. Comparison of commercial real-time RT-PCR assays for reliable, early and rapid detection of different heterologous strains of porcine reproductive and respiratory syndrome virus (PRRSV) in experimentally infected or negative boars using different sample types (semen, oral fluids, serum, blood swabs). *J Clin Microbiol* 51:547-556.
- Gerber PF, Xiao C-T, Chen Q, Zhang J, Halbur PG, Opriessnig T. 2014. The spray-drying process is sufficient to inactivate infectious porcine epidemic diarrhea virus in plasma. *Vet Microbiol* 174:86-92.
- Giménez-Lirola LG, Gerber PF, Rowland RR, Halbur PG, Huang YW, Meng XJ, Opriessnig T. 2014. Development and validation of a 4-plex antibody assay for simultaneous detection of IgG antibodies against Torque teno sus virus 1 (TTSuV1), TTSuV2, and porcine reproductive and respiratory syndrome virus types 1 and 2. *Res Vet Sci.* 96:543-550.
- Giménez-Lirola LG, P.F. Gerber, R.R. Rowland, P.G. Halbur, Y.W. Huang, X.J. Meng, and T. Opriessnig. 2014. Development and validation of a 4-plex antibody assay for simultaneous detection of IgG antibodies against Torque teno sus virus 1 (TTSuV1), TTSuV2, and porcine reproductive and respiratory syndrome virus types 1 and 2. *Research in Veterinary Sciences.* 96(3):543-550.
- Go YY, Li Y, Chen Z, Han M, Yoo D, Fang Y, Balasuriya UB. 2014. Equine arteritis virus does not induce interferon production in equine endothelial cells: identification of nonstructural protein 1 as a main interferon antagonist. *Biomed Res Int.* 2014:420658.
- Go, Y.Y., Li, Y., Chen, Z., Han, M., Yoo, D., Fang, Y., and Balasuriya, U. 2014. Equine arterivirus does not induce interferon production in equine endothelial cells: Identification of non-structural protein 1 as a main interferon antagonist. *BioMed Res Intl. (Special Issue of Animal Arterivirus Infection)* Vol. 2014, Article ID 420658, 13 pages. <http://dx.doi.org/10.1155/2014/420658>.
- Goodell CK, Prickett J, Kittawornrat A, Johnson J, Zhang J, Wang C, Zimmerman J. 2014. Evaluation of screening assays for the detection of influenza A virus serum antibodies in swine. *Transbound Emerg Dis* DOI: 10.1111/tbed.12214.
- Goodell CK, Prickett J, Kittawornrat A, Zhou F, Rauh R, Nelson W, O'Connell C, Burrell A, Wang C, Yoon K-J, Zimmerman JJ. 2013. Probability of detecting influenza A virus

subtypes H1N1 and H3N2 in individual pig nasal swabs and pen-based oral fluid specimens over time. *Vet Microbiol* 166:450-460.

- Goodell CK, Zhang J, Strait E, Harmon K, Patnayak D, Otterson T, Gramer M, Christopher-Hennings J, Clement T, Leslie-Steen P, Hesse R, Anderson J, Skarbek K, Vincent A, Kitikoon P, Swenson S, Jenkins-Moore M, McGill J, Rauh R, Nelson W, O'Connell C, Shah R, Wang C, Main R, Zimmerman J. 2014. Ring test evaluation of the detection of influenza A virus in swine oral fluids by real-time, reverse transcription polymerase chain reaction and virus isolation. *J Vet Diagn Invest* (in press).
- Goyal SM, Chander Y, Yezli S, Otter JA. 2014. Evaluating the virucidal efficacy of hydrogen peroxide vapour. *J Hosp Infect.* 86:255-9.
- Guarino H, Moura J, Cox RB, Goyal SM, Patnayak DP. 2014. Survival of porcine reproductive and respiratory syndrome virus in fresh pork. *Acta Vet Hung.* 62:257-63.
- Han M, Kim CY, Rowland RR, Fang Y, Kim D, Yoo D. 2014. Biogenesis of non-structural protein 1 (nsp1) and nsp1-mediated type I interferon modulation in arteriviruses. *Virology.* 458-459:136-50.
- Han, D., Hu, Y., Li, L., Tian, H., Chen, Z., Wang, L., Ma, H., Yang, H., Teng, K., 2014. Highly pathogenic porcine reproductive and respiratory syndrome virus infection results in acute lung injury of the infected pigs. *Veterinary microbiology* 169, 135-146.
- Han, M., and D. Yoo. 2014. Engineering the PRRS virus genome: Updates and perspectives. *Vet Microbiol (Review)* 174:279-295.  
<http://dx.doi.org/10.1016/j.vetmic.2014.10.007>
- Han, M., and D. Yoo. 2014. Modulation of innate immune signaling by nonstructural protein 1 (nsp1) in the family Arteriviridae. *Virus Res.*  
<http://dx.doi.org/10.1016/j.virusres.2014.09.007> (In press).
- Han, M., C.Y. Kim, R.R.R. Rowland, Y. Fang, D. Kim, and D. Yoo. 2014. Biogenesis of non-structural protein 1 (nsp1) and nsp1-mediated type I interferon modulation in arteriviruses. *Virology* 458-469:136-150.
- Han, MY, CY Kim, RR Rowland, Y Fang, D Kim, D Yoo. 2014. Biogenesis of non-structural protein 1 (nsp1) and nsp1-mediated type I interferon modulation in arteriviruses. *Virology.* 458-459:136-150.
- Hemann M, Beach NM, Meng X-J, Wang C, Halbur PG, Opriessnig T. 2014. A live-attenuated and an inactivated chimeric porcine circovirus (PCV)1-2 vaccine are both effective at inducing a humoral immune response and reducing PCV2 viremia and intrauterine infection in female swine of breeding age. *Can J Vet Res* 78:8-16.
- Hemann M, N.M. Beach, X.J. Meng, P.G. Halbur, and T. Opriessnig. 2014. A live-attenuated and an inactivated chimeric porcine circovirus (PCV) vaccine are both effective at inducing a humoral immune response and reducing PCV2 viremia and intrauterine infection in female swine of breeding age. *Canadian Journal of Veterinary Research.* 78(1):8-16.
- Hoang H, Killian ML, Madson DM, Arruda PHE, Sun D, Schwartz KJ, Yoon KJ. 2013. Full-length genome sequence of a plaque-cloned virulent porcine epidemic diarrhea virus isolate (USA/Iowa/18984/2013) from a US Midwestern swine herd. *Genome Announc* 1(6):e01049-13.
- Holtkamp D, Kliebenstein J, Neumann E, Zimmerman J, Rotto H, Yeske P, Yoder T, Wang C, Mowrer C, Haley CA. 2013. Assessment of the economic impact of porcine

reproductive and respiratory syndrome virus on United States pork producers. *J Swine Health Prod* 21:72-84.

- Holtkamp DJ, Lin H, Wang C, Polson DD. 2013. Development and validation of an objective risk scoring system for assessing the likelihood of virus introduction in porcine reproductive and respiratory syndrome virus-free sow farms in the US. *OJVM* 3:168-175.
- Huang J, Mor SK, Erber J, Voss E, Goyal SM. 2014. Detection and characterization of porcine bocavirus in the United States. *Arch Virol*.159:1797-801.
- Huang N, Singh N, Yoon KJ, Loiacono CM, Kohut ML, Birt DF. 2013. The immunoregulatory impact of orally-administered hypericum perforatum extract on BALB/c mice inoculated with H1N1 influenza A virus. *PLoS ONE* 8(9):e76491.
- Huang YW, A.W. Dickerman, P. Pineyro, L. Li, L. Fang, R. Kiehne, T. Opriessnig, and X.J. Meng. 2013. Origin, evolution, and genotyping of emergent porcine endemic diarrhea virus (PEDV) strains in the United States. *mBio*. 4(5):e00737-13. doi:10.1128/mBio.00737-13.
- Identification of a novel single-stranded circular DNA virus in pig feces. *Genome*
- Islam ZU, Bishop SC, Savill NJ, Rowland RRR, Lunney JK, Tribble B, Doeschl-Wilson AB. 2013. Quantitative analysis of Porcine Reproductive and Respiratory Syndrome (PRRS) viremia profiles from experimental infection: a statistical modelling approach. *PLOS ONE*. PLOS ONE. 8: e83567.
- Islam ZU, SC Bishop, NJ Savill, RR Rowland, JK Lunney, B Tribble, AB Doeschl-Wilson. 2013. Quantitative analysis of porcine reproductive and respiratory syndrome (PRRS) viremia profiles from experimental infection: a statistical modelling approach. *PLoS One*. 8:e83567
- Jones C, Madson D, Main R, Gabler N, Patience J. 2014. Poor weaning transition ADG in pigs is not correlated with pathological or immunological markers of enteric disease during a PRRSV outbreak. *J Anim Sci* 92:2568-2577.
- Kappes MA, Miller CL, Faaberg KS. 2013. Highly divergent strains of porcine reproductive and respiratory syndrome virus incorporate multiple isoforms of nonstructural protein 2 into virions. *J. Virol*. 87:13456-13465.
- Kitikoon P, Gauger PC, Anderson TK, Culhane MR, Swenson S, Loving CL, Perez DR, Vincent AL. 2013. Swine influenza virus vaccine serologic cross-reactivity to contemporary US swine H3N2 and efficacy in pigs infected with an H3N2 similar to 2011-2012 H3N2v. *Influenza Other Respir Viruses* 7 Suppl 4:32-41.
- Kitikoon P, Gauger PC, Vincent AL. 2014. Hemagglutinin inhibition assay with swine sera. *Methods Mol. Biol.* 1161:295-301.
- Kitikoon P, Loving CL, Vincent AL. 2014. Antibody secreting cell assay for influenza A virus in swine. *Methods Mol. Biol.* 1161:347-353.
- Kitikoon P, Vincent AL. 2014. Microneutralization assay for swine influenza virus in swine serum. *Methods Mol. Biol.* 1161:325-335.
- Kittawornrat A, Engle M, Panyasing Y, Olsen C, Schwartz K, Ballagi A, Rice A, Lizano S, Wang C, Zimmerman J. 2013. Kinetics of the porcine reproductive and respiratory syndrome virus (PRRSV) humoral immune response in swine serum and oral fluids collected from individual boars. *BMS Vet Res* 9:61 (doi:10.1186/1746-6148-9-61).
- Kittawornrat A, Panyasing Y, Goodell C, Wang C, Gauger P, Harmon K, Rauh R, Defresne L, Levis I, Zimmerman J. 2014. Porcine reproductive and respiratory

syndrome virus (PRRSV) surveillance using pre-weaning oral fluid samples detects circulation of wild-type PRRSV. *Vet Microbiol* 168:331-339.

- Krueger WS, Heil GL, Yoon K-J, Gray GC. 2014. Serological results suggest that zoonotic infections with H3N8 canine influenza A virus are not occurring among U.S. adults occupationally exposed to dogs. *Influenza Other Respi Viruses* DOI: 10.1111/irv.12208 (in press)
- Ladinig A, Foxcroft G, Ashley C, Lunney JK, Plastow G, Harding JCS. 2014. Birth weight, intrauterine growth retardation and fetal susceptibility to porcine reproductive and respiratory syndrome virus. 9: e109541.
- Ladinig A, Lunney JK, Souza CJH, Ashley C, Plastow G, Harding JCS. 2014. Cytokine profiles in pregnant gilts experimentally infected with porcine reproductive and respiratory syndrome virus and relationships with viral load and fetal outcome. *Vet Res.* In Press.
- Ladinig A, Wilkinson J, Ashley C, Detmer SE, Lunney JK, Plastow G, Harding JCS. 2014. Variation in fetal outcome, viral load and ORF5 sequence mutations in a large scale study of phenotypic responses to late gestation exposure to type 2 Porcine Reproductive and Respiratory Syndrome Virus. *Plos One.* 9: e96104.
- Lager KM, Schlink SN, Brockmeier SL, Miller LC, Henningson JN, Kappes MA, Kehrli ME, Loving CL, Guo B, Swenson SL, Yang HC, Faaberg KS. 2014. Efficacy of Type 2 PRRSV vaccine against Chinese and Vietnamese HP-PRRSV challenge in pigs. *Vaccine.*
- Lager KM, Vincent AL. 2014. In vivo models for pathotyping and vaccine efficacy for swine influenza. *Methods Mol. Biol.* 1161:355-361.
- Lauck M, Palacios G, Wiley MR, L Y, Fāng Y, Lackemeyer MG, Cai Y, Bailey AL, Postnikova E, Radoshitzky SR, Johnson RF, Alkhovsky SV, Deriabin PG, Friedrich TC, Goldberg TL, Jahrling PB, O'Connor DH, Kuhn JH. 2014. Genome Sequences of Simian Hemorrhagic Fever Virus Variant NIH LVR42-0/M6941 Isolates (Arteriviridae: Arterivirus). *Genome Announc.* 2(5).Ewen, CL, AG Cino-Ozuna, H He, MA Kerrigan, JCM Dekkers, CK Tuggle, RRR Rowland, CR Wyatt. Analysis of blood leukocytes in a naturally occurring immunodeficiency of pigs shows the defect is localized to B and T cells. *J Vet Immunol Immunopath.* in press.
- Lauck, M., S. D. Sibley, D. Hyeroba, A. Tumukunde, G. Weny, C. A. Chapman, N. Ting, W. M. Switzer, J. H. Kuhn, T. C. Friedrich, D. H. O'Connor and T. L. Goldberg (2013). Exceptional simian hemorrhagic Fever virus diversity in a wild african primate community. *J Virol* 87(1): 688-691.
- Lee JA, Kwon B, Osorio FA, Pattnaik AK, Lee NH, Lee SW, Park SY, Song CS, Choi IS, Lee JB 2014. Protective humoral immune response induced by an inactivated porcine reproductive and respiratory syndrome virus expressing the hypo-glycosylated glycoprotein 5. *Vaccine.* 2014 32(29):3617-22. PMID: 24814552
- Lewis NS, Anderson TK, Kitikoon P, Skepner E, Burke DF, Vincent AL. 2014. Substitutions near the hemagglutinin receptor-binding site determine the antigenic evolution of influenza A H3N2 viruses in U.S. swine. *J. Virol.* 88:4752-4763.
- Li G, Chen Q, Harmon KM, Yoon KJ, Schwartz KJ, Hoogland MJ, Gauger PC, Main RG, Zhang J. 2014. Full-length genome sequence of porcine deltacoronavirus strain USA/IA/2014/8734. *Genome Announc* 2(2):e00278-14.
- Li X, Galliher-Beckley A, Pappan L, Tribble B, Kerrigan M, Beck A, Hesse R, Blecha F, Nietfeld JC, Rowland RR, Shi J. 2014. Comparison of host immune responses to

homologous and heterologous type II porcine reproductive and respiratory syndrome virus (PRRSV) challenge in vaccinated and unvaccinated pigs. *Biomed Res Int*. 2014;416727.

- Li Y, Treffers EE, Naphthine S, Tas A, Zhu L, Sun Z, Bell S, Mark BL, van Veelen PA, van Hemert MJ, Firth AE, Brierley I, Snijder EJ, Fang Y. 2014. Transactivation of programmed ribosomal frameshifting by a viral protein. *Proc Natl Acad Sci U S A*. 111(21):E2172-81.
- Li, Y., Zhou, L., Zhang, J., Ge, X., Zhou, R., Zheng, H., Geng, G., Guo, X., Yang, H., 2014. Nsp9 and Nsp10 contribute to the fatal virulence of highly pathogenic porcine reproductive and respiratory syndrome virus emerging in China. *PLoS pathogens* 10, e1004216.
- Lin H, Wang C, Liu P, Holtkamp DJ. 2013. Construction of disease risk scoring systems using logistic group lasso: application to porcine reproductive and respiratory syndrome survey data. *J Appl Stat* 40:736-746.
- Linhares DC, Cano JP, Torremorell M, Morrison RB. 2014. Comparison of time to PRRSV-stability and production losses between two exposure programs to control PRRSV in sow herds. *Prev Vet Med*. 116:111-9.
- Lorusso A, Ciacci-Zanella JR, Zanella EL, Pena L, Perez DR, Lager KM, Rajao DS, Loving CL, Kitikoon P, Vincent AL. 2014. Polymorphisms in the hemagglutinin gene influenced the viral shedding of pandemic 2009 influenza virus in swine. *J. Gen. Virol*.
- Loving CL, Brockmeier SL, Vincent AL, Gauger PC, Zanella EL, Lager KM, Kehrl ME, Jr. 2014. Cross-fostering to prevent maternal cell transfer did not prevent vaccine-associated enhanced respiratory disease that occurred following heterologous influenza challenge of pigs vaccinated in the presence of maternal immunity. *Viral Immunol*. 27:334-342.
- Loving CL, Lager KM, Vincent AL, Brockmeier SL, Gauger PC, Anderson TK, Kitikoon P, Perez DR, Kehrl ME, Jr. 2013. Efficacy in pigs of inactivated and live attenuated influenza virus vaccines against infection and transmission of an emerging H3N2 similar to the 2011-2012 H3N2v. *J. Virol*. 87:9895-9903.
- Lowe J, Gauger P, Harmon K, Zhang J, Connor J, Yeske P, Loula T, Levis I, Dufresne L, Main R. 2014. The role of harvest plant lairage and transportation in propagating the initial stages of an outbreak of porcine epidemic diarrhea virus in the United States in 2013. *Emerg Infect Dis* 20:872-874
- Madson DM, Magstadt DR, Arruda PHE, Hoang H, Sun D, Bower LP, Bhandari M, Burrough ER, Gauger PC, Pillatzki AE, Stevenson GW, Wilberts BL, Brodie J, Harmon KM, Wang C, Main RG, Zhang J, Yoon KJ. 2014. Pathogenesis of porcine epidemic diarrhea virus isolate (US/Iowa/18984/2013) in 3-week-old weaned pigs. *Vet Microbiol* 174:60-68.
- Magtoto RL, Vegi. A, Wang. C, Johnson. J. K and Ramamoorthy. S. Evaluation and use of a serological assay for the detection of antibodies to *Lawsonia intracellularis* in swine, *Int J of Vet Sci Med* (2014), <http://dx.doi.org/10.1016/j.ijvsm.2014.08.001>
- Marthaler D, Bruner L, Collins J, Rossow K. 2014. Third strain of porcine epidemic diarrhea virus, United States. *Emerg Infect Dis*. 20:2162-3.
- Marthaler D, Homwong N, Rossow K, Culhane M, Goyal S, Collins J, Matthijnssens J, Ciarlet M. 2014. Rapid detection and high occurrence of porcine rotavirus A, B, and C by RT-qPCR in diagnostic samples. *J Virol Methods*. 209:30-4.

- Marthaler D, Jiang Y, Collins J, Rossow K. 2014. Complete Genome Sequence of Strain SDCV/USA/Illinois121/2014, a Porcine Deltacoronavirus from the United States. *Genome Announc.* 22(2). pii: e00218-14. doi: 10.1128/genomeA.00218-14.
- Marthaler D, Raymond L, Jiang Y, Collins J, Rossow K, Rovira A. 2014. Rapid detection, complete genome sequencing, and phylogenetic analysis of porcine deltacoronavirus. *Emerg Infect Dis.* 20:1347-50.
- Marthaler D, Rossow K, Culhane M, Goyal S, Collins J, Matthijssens J, Nelson M, Ciarlet M. 2014. Widespread rotavirus H in commercially raised pigs, United States. *Emerg Infect Dis.* 20:1195-8.
- Marthaler D, Suzuki T, Rossow K, Culhane M, Collins J, Goyal S, Tsunemitsu H, Ciarlet M, Matthijssens J. 2014. VP6 genetic diversity, reassortment, intragenic recombination and classification of rotavirus B in American and Japanese pigs. *Vet Microbiol.* 172:359-66.
- McCutcheon KM, Gray J, Chen NY, Liu K, Park M, Ellsworth S, Tripp RA, Tompkins SM, Johnson SK, Samet S, Pereira L, Kauvar LM. Multiplexed screening of natural humoral immunity identifies antibodies at fine specificity for complex and dynamic viral targets. *MAbs.* 2014 Mar-Apr;6(2):460-73. doi: 10.4161/mabs.27760. Epub 2014 Jan 8. PMID: 24492306.
- Miller LC, Jiang Z, Sang Y, Harhay GP, Lager KM. 2014. Evolutionary characterization of pig interferon-inducible transmembrane gene family and member expression dynamics in tracheobronchial lymph nodes of pigs infected with swine respiratory disease viruses. *Vet. Immunol. Immunopathol.* 159:180-191.
- Miller LC, Jiang Z, Sang Y, Harhay GP, Lager KM. Evolutionary characterization of pig interferon-inducible transmembrane gene family and member expression dynamics in tracheobronchial lymph nodes of pigs infected with swine respiratory disease viruses. *Vet Immunol Immunopathol.* 2014 Jun 15;159(3-4):180-91.
- Mur L, Gallardo C, Soler A, Zimmerman J, Pelayo V, Nieto R, Sánchez-Vizcaíno JM, Aria M. 2013. Potential use of oral fluid samples for serological diagnosis of African swine fever. *Vet Microbiol* 165:135-139.
- Murtaugh MP. 2014. Advances in swine immunology help move vaccine technology forward. *Vet. Immunol. Immunopathol.* 159:202-207.
- Negri P, Choi JY, Jones C, Tompkins SM, Tripp RA, Dluhy RA. Identification of virulence determinants in influenza viruses. *Anal Chem.* 2014 Jul 15;86(14):6911-7. doi: 10.1021/ac500659f. Epub 2014 Jun 27. PMID: 24937567.
- Nelson MI, Wentworth DE, Culhane MR, Vincent AL, Viboud C, LaPointe MP, Lin X, Holmes EC, Detmer SE. 2014. Introductions and evolution of human-origin seasonal influenza A viruses in multinational swine populations. *J. Virol.* 88:10110-10119.
- Nelson MI, Wentworth DE, Culhane MR, Vincent AL, Viboud C, LaPointe MP, Lin X, Holmes EC, Detmer SE. 2014. Introductions and evolution of human-origin seasonal influenza A viruses in multinational swine populations. *J Virol.* 88:10110-9.
- Ni YY, Z. Zhao, T. Opriessnig, S. Subramaniam, L. Zhou, D. Cao, Q. Cao, H. Yang, and X.J. Meng. 2014. Computer-aided codon-pairs deoptimization of the major envelope GP5 gene attenuates porcine reproductive and respiratory syndrome virus. *Virology.* 450-451:132-139.
- Oka T, Saif LJ, Marthaler D, Esseili MA, Meulia T, Lin CM, Vlasova AN, Jung K, Zhang Y, Wang Q. 2014. Cell culture isolation and sequence analysis of genetically

diverse US porcine epidemic diarrhea virus strains including a novel strain with a large deletion in the spike gene. *Vet Microbiol.* 173:258-69.

- Olsen C, Karriker L, Wang C, Binjawadagi B, Renukaradhya G, Kittawornrat A, Lizano S, Coetzee J, Main R, Meiszberg A, Panyasing Y, Zimmerman J. 2013. Effect of collection material on pig oral fluid testing results. *Vet J* 198:158-163.
- Olsen C, L. Karriker, C. Wang, G.J. Renukaradhya, B. Binjawadagi, A. Kittawornrat, S. Lizano, J. Coetzee, R. Main, A. Meiszberg, Y. Panyasing, J. Zimmerman (2013). Effect of collection material on pig oral fluid testing results. *Veterinary Journal*, 198(1):158-163. PMID: 24011474
- Olsen C, Wang C, Christopher-Hennings J, Doolittle K, Harmon K, Abate S, Kittawornrat A, Lizano S, Main R, Nelson E, Otterson T, Panyasing Y, Rademacher C, Rauh R, Shah R, Zimmerman J. 2013. Probability of detecting PRRSV infection using pen-based swine oral fluid specimens as a function of within-pen prevalence. *J Vet Diagn Invest* 25:328-335.
- Opriessnig T, O'Neill K, Gerber PF, Gomes de Castro AM, Giménez-Lirola LG, Beach NM, Zhou L, Meng X-J, Wang C, Halbur PG. 2013. A PCV2 vaccine based on genotype 2b is more effective than a 2a-based vaccine to protect against PCV2b or combined PCV2a/2b viremia in pigs with concurrent PCV2, PRRSV and PPV infection. *Vaccine* 31:487-494.
- Opriessnig T, P.F. Gerber, C.T. Xiao, P.G. Halbur, S.R. Matzinger, and X.J. Meng. 2014. Commercial PCV2a-based vaccines are effective in protecting naturally PCV2b-infected finisher pigs against experimental challenge with a 2012 mutant PCV2. *Vaccine*. 32(34):4342-4348.
- Opriessnig T, Xiao CT, Gerber PF, Halbur PG, Matzinger SR, and X.J. Meng. 2014. Mutant USA strain of porcine circovirus type 2 (mPCV2) exhibits similar virulence to the classical PCV2a and PCV2b strains in caesarian-derived colostrum-deprived pigs. *Journal of General Virology*. 95(Pt 11):2495-503.
- Opriessnig T, Xiao C-T, Gerber PF, Zhang J, Halbur PG. 2014. Porcine epidemic diarrhea virus RNA present in commercial spray-dried porcine plasma is not infectious to naïve pigs. *PLoS ONE* 9(8): e104766.
- Ouyang K, Binjawadagi B, Kittawornrat A, Olsen C, Hiremath J, Elkalifa N, Schelappi R, Wu J, Zimmerman J, Gourapura RJ. 2013. Development and validation of an assay to detect porcine reproductive and respiratory syndrome virus-specific neutralizing antibody titers in pig oral fluid samples. *Clin Vaccine Immunol* 20:1305-1313.
- Ouyang K, S.A. Woodiga, V. Dwivedi, C.M. Buckwalter, A.K. Singh, B. Binjawadagi, J. Hiremath, C. Manickam, R. Schleppi, M. Khatri, J. Wu, S.J. King, and G.J. Renukaradhya\* (2014). Pretreatment of epithelial cells with live *Streptococcus pneumoniae* has no detectable effect on influenza A virus replication in vitro. *PLoS One*. 9(3):e90066. PMID: 24594847
- Panyasing Y, Goodell C, Giménez-Lirola L, Kittawornrat A, Wang C, Schwartz KJ, Lizano S, Zimmerman J. 2013. Kinetics of influenza A virus nucleoprotein antibody (IgM, IgA, IgG) in serum and oral fluid specimens from pigs infected under experimental conditions. *Vaccine* 31:6210-6215.
- Panyasing Y, Goodell C, Kattawornrat A, Wang C, Levis I, Defresne I, Rauh R, Gauger P, Zhang J, Lin K, Azeem S, Nezami S, Yoon K-J, Zimmerman J. 2014. Influenza A

virus (IAV) surveillance using pre-weaning piglet oral fluid samples. *Transbound Emerg Dis* (in press).

- Panyasing Y, Irwin CK, Wang C, Kittawornrat A, Prickett JR, Schwartz KJ, Zimmerman JJ. 2013. Detection of influenza A virus nucleoprotein antibodies in oral fluid specimens from pigs infected under experimental conditions using a blocking ELISA. *Transbound Emerg Dis* 61:177-184.
- Pepin B, Kittawornrat A, Liu F, Gauger P, Harmon K, Abate S, Main R, Garton C, Hargrove J, Rademacher C, Ramirez A, Zimmerman J. 2013. Comparison of specimens for detection of porcine reproductive and respiratory syndrome virus infection in boar studs. *Transbound Emerg Dis* doi: 10.1111/tbed.12135.
- Pepin B, Liu F, Main R, Ramirez A, Zimmerman J. 2014. Collection of oral fluids from individually-housed sows. *J Swine Health Prod* (in press).
- Perez A, Davies P, Goodell C, Holtkamp D, Mondaca E, Poljak Z, Tousignant S, Valdes-Donoso P, Zimmerman J, Morrison R. 2015. Review of literature for epidemiology and control of porcine reproductive and respiratory syndrome virus (PRRSV) in North America: lessons learned and knowledge gaps. *J Am Vet Med Assoc* (in press).
- Perwitasari O, Johnson S, Yan X, Howerth E, Shacham S, Landesman Y, Baloglu E, McCauley D, Tamir S, Tompkins SM, Tripp RA. Verdinexor, a novel selective inhibitor of nuclear export, reduces influenza a virus replication in vitro and in vivo. *J Virol*. 2014 Sep 1;88(17):10228-43. doi: 10.1128/JVI.01774-14. Epub 2014 Jun 25. PMID: 24965445.
- Perwitasari O, Torrecilhas AC, Yan X, Johnson S, White C, Tompkins SM, Tripp RA. Targeting cell division cycle 25 homolog B to regulate influenza virus replication. *J Virol*. 2013 Dec;87(24):13775-84. doi: 10.1128/JVI.01509-13. Epub 2013 Oct 9. PMID: 24109234.
- Powell JD, Dlugolenski D, Nagy T, Gabbard J, Lee C, Tompkins SM, Tripp RA. Polymerase Discordance in Novel Swine Influenza H3N2v Constellations Is Tolerated in Swine but Not Human Respiratory Epithelial Cells. *PLoS One*. 2014 Oct 16;9(10):e110264. doi: 10.1371/journal.pone.0110264. PMID: 25330303.
- Prather, RS, RRR Rowland, C Ewen, B Tribble, M Kerrigan, B Bawa, JM Teson, J Mao, K Lee, MS Samuel, KM Whitworth, CN Murphy, T Egen, JA Green. 2013. An intact sialoadhesin (Sn/SIGLEC1/CD169) is not required for attachment/internalization of the porcine reproductive and respiratory syndrome virus (PRRSV). *J Virol*, 87:9538-9546.
- Rajao DS, Anderson TK, Gauger PC, Vincent AL. 2014. Pathogenesis and vaccination of influenza a virus in swine. *Curr. Top. Microbiol. Immunol.* 385:307-326.
- Rajao DS, Loving CL, Gauger PC, Kitikoon P, Vincent AL. 2014. Influenza A virus hemagglutinin protein subunit vaccine elicits vaccine-associated enhanced respiratory disease in pigs. *Vaccine* 32:5170-5176.
- Reynolds JJ, Torremorell M, Craft ME. 2014. 2014. Mathematical modeling of influenza A virus dynamics within swine farms and the effects of vaccination. *PLoS One*. 9:e106177. doi: 10.1371/journal.pone.0106177.
- Sage LK, Fox JM, Mellor AL, Tompkins SM, Tripp RA. Indoleamine 2,3-dioxygenase (IDO) activity during the primary immune response to influenza infection modifies the memory T cell response to influenza challenge. *Viral Immunol*. 2014 Apr;27(3):112-23. doi: 10.1089/vim.2013.0105. Epub 2014 Apr 4. PMID: 24702331.

- Sang Y, Brichalli W, Rowland RR, Blecha F. 2014. Genome-wide analysis of antiviral signature genes in porcine macrophages at different activation statuses. *PLoS One*. 9:e87613.
- Sang Y, RR Rowland, F Blecha. 2014. Antiviral regulation in porcine monocytic cells at different activation states. *J Virol*. 88:11395-11410.
- Schwartz JC Murtaugh MP. 2014. 2014. Characterization of a polymorphic IGLV gene in pigs (*Sus scrofa*). *Immunogenetics*. 66:507-511.
- Snijder EJ, Kikkert M, Fang Y. Arterivirus molecular biology and pathogenesis. *J. Gen. Virol*. 94:2141-63. Review.
- Stephenson, R, B Triple, Y Wang, M Kerrigan, S Goldstein, R Rowland. Multiplex serology for common viral infections in feral pigs in Hawaii between 2007 and 2010. *J Wildlife Dis*. In press
- Stevenson GW, Hoang H, Schwartz KJ, Burrough ER, Sun D, Madson DM, Cooper VL, Pillatzki AE, Gauger PC, Schmitt BJ, Koster LG, Killian ML, Yoon KJ. 2013. Emergence of porcine epidemic diarrhea virus in the United States: clinical signs, lesions, and viral genomic sequences. *J Vet Diagn Invest* 25:649-654.
- Stricker AM, Polson DD, Murtaugh MP, Hennings J, Clement T. 2014. Variation in PRRS virus ORF5 diagnostic sequencing. *J Swine Hlth Prod*. In press.
- Subramaniam S., P. Pineyro, D. Tian, C. Overend, D.M. Yugo, S.R. Matzinger, A.J. Rogers, M.E.R. Haac, Q. Cao, C.L. Heffron, N. Catanzaro, S.P. Kenney, Y.W. Huang, T. Opriessnig, and X.J. Meng. 2014. In vivo targeting of porcine reproductive and respiratory syndrome virus antigen through porcine DC-SIGN to dendritic cells elicits antigen-specific CD4 T cell immunity in pigs. *Vaccine*. In Press. DOI: 10.1016/j.vaccine.2014.10.005.
- Sun Z, Lawson S, Langenhorst R, McCormick KL, Brunick C, Opriessnig T, Baker R, Yoon K-J, Zhang W, Huber V, Fang Y. 2013. Development of an epitope-based vaccine against swine influenza A virus using *Escherichia coli* heat-labile toxin B subunit as a carrier-adjuvant. *Vet Microbiol* 164:229-238.
- Sun, Y., D. Li, S. Giri, S., S.G. Prasanth, and D. Yoo. 2014. Differential host cell gene expression and the regulation of cell cycle progression by non-structural protein 11 of porcine reproductive and respiratory syndrome virus. *BioMed Res. Intl. (Special Issue of Animal Arterivirus Infection)* Vol. 2014, Article IL430608, 13 pages. <http://dx.doi.org/10.1155/2014/430508>
- Thomas PR, Karriker LA, Ramirez A, Zhang J, Ellingson JS, Crawford K, Bates J, Hammen KJ, Holtkamp D. 2014. Evaluation of time and temperature sufficient to inactivate porcine epidemic diarrhea virus in swine feces on metal surfaces. *J Swine Health Prod* (in press).
- Uddin Kahn S, Atanasova KR, Kruger WS, Ramirez A, Gray GG. 2013. Epidemiology, geographical distribution, and economic consequences of swine zoonoses: a narrative review. *Emerg Microb Infect* 2:e92. doi:10.1038/emi.2013.87.
- Vincent AL, Lager KM, Anderson TK. 2014. A brief introduction to influenza A virus in swine. *Methods Mol. Biol*. 1161:243-258.
- Vlasova AN, Marthaler D, Wang Q, Culhane MR, Rossow KD, Rovira A, Collins J, Saif LJ. 2014. Distinct characteristics and complex evolution of PEDV strains, North America, May 2013-February 2014. *Emerg Infect Dis*. 20:1620-8.

- Wang R and Y. Zhang: Antagonizing Interferon-Mediated Immune Response by Porcine Reproductive and Respiratory Syndrome Virus. *BioMed Research International* 2014;2014:315470. Epub 2014 Jul 3.
- Wang, L., Zhou, L., Zhang, H., Li, Y., Ge, X., Guo, X., Yu, K., Yang, H., 2014a. Interactome profile of the host cellular proteins and the nonstructural protein 2 of porcine reproductive and respiratory syndrome virus. *PloS one* 9, e99176.
- Wang, X., Li, C., Zhou, L., Zhang, N., Wang, X., Ge, X., Guo, X., Yang, H., 2014d. Porcine reproductive and respiratory syndrome virus counteracts the porcine intrinsic virus restriction factors-IFITM1 and Tetherin in MARC-145 cells. *Virus research* 191, 92-100.
- White D, Rotolo M, Olsen C, Wang C, Prickett J, Kittawornrat A, Panyasing Y, Main R, Rademacher C, Hoogland M, Zimmerman J. 2014. Recommendations for pen-based oral fluid collection in growing pigs. *J Swine Health Prod* 22:138-141.
- Xiuqing Wang, Hanmo Zhang, Alex M. Abel, Alan J. Young, Liji Xie & Zhixun Xie. Role of phosphatidylinositol 3-kinase (PI3K) and Akt1 kinase in porcine reproductive and respiratory syndrome virus (PRRSV) replication. *Arch Virol*, 2014, 159:2091-2096.
- Ye J, Xu Y, Harris J, Sun H, Bowman A, Cunningham F, Cardona C, Yoon KJ, Slemmons RD, Wang X-F. 2013. Mutation from arginine to lysine at the position 189 of hemagglutinin contributes to the antigenic drift in H3N2 swine influenza viruses. *Virology* 446:225-229.
- Yin SH, Gerbera PF, Xiao CT, Beach NM, X.J. Meng, Halbur PG, and T. Opriessnig. 2013. Concurrent porcine circovirus type 2a (PCV2a) or PCV2b infection increases the rates of amino acid mutations of porcine reproductive and respiratory syndrome virus (PRRSV) during serial passages in pigs. *Virus Research*. 178(2):445-51.
- Zhang J, Chen Q, Gauger PC, Harmon KM, Yoon KJ. 2014. Reply to ‘Classification of emergent U.S. strains of porcine epidemic diarrhea virus by phylogenetic analysis of nucleocapsid and ORF3 genes’. *J Clin Microbiol* 52:3511-3514.
- Zhou, L., Yang, X., Tian, Y., Yin, S., Geng, G., Ge, X., Guo, X., Yang, H., 2014. Genetic diversity analysis of genotype 2 porcine reproductive and respiratory syndrome viruses emerging in recent years in China. *BioMed research international* 2014, 748068.

## 2) Abstracts or Proceedings

- Alonso C, Raynor P, Davies P, Torremorell M (2014). Effect of the electrostatic particle ionization technology on PRRS and influenza aerosols under experimental conditions. *Proc Am Assoc Swine Vet*, Dallas, USA, p:375
- Binjawadagi, B, V. Dwivedi, C. Manickam, K. Ouyang, Torrelles, J, and
- Boddicker NJ, Lunney JK, Rowland RRR, Reecy JM, Serao N, Dekkers JCM. 2013. A major gene for host response to PRRSV infection. 2013 Allen D. Leman Swine Conference. September 14- 17, 2013. St. Paul, MN.
- Caya, I., M. Bertrand, A. Broes, S. Lawson, E.A. Nelson, J. Christopher-Hennings. Development of an indirect enzyme-linked immunosorbent assay (ELISA) for detection of antibodies against porcine epidemic diarrhea virus (PEDV). *AAVLD*, Oct. 2014

- Characterization of Genetic Variation in Non Structural Protein 2 in Pigs During Experimental Infection with Porcine Reproductive and Respiratory Syndrome Virus, NA PRRS Symp. 2013.
- Chen, W-Y., Calzada-Nova, G., Schnitzlein, W., Zuckermann, F.A.. 2014. The PRRSV-mediated inhibition of IFN $\alpha$  production by pig alveolar macrophages occurs at the post-transcriptional level via the activation of eIF-2 $\alpha$ . Pathobiology Department, University of Illinois at Urbana-Champaign, IL CRWAD, Chicago, IL, December 2014.
- Choi I, Bao H, Kommadath A, Sun X, Meng Y, Guan LL, G.S. Plastow GS, Rowland RRR, Abrams SM, Lunney JK, Stothard P. 2014. Whole Blood Transcriptome Analyses of Swine Responses to PRRSV Infection. 2014. PAG Abstract P603 –
- Constans. M, Chelladurai. J. J\$, Semmadali. M and Ramamoorthy. S. \$ - equal contribution. Epitope determinants of vaccine escape by porcine circovirus strain 2 (PCV2). Dec 2013. 92th Annual Meeting of the CRWAD, Chicago, IL
- Crawford, K., Lager, K.M., Miller, L.C., Loving, C.L., Opriessnig, T., Gerber, P. (2014). Evaluation of porcine epidemic diarrhea virus transmission and the immune response in growing pigs. Conference of Research Workers in Animal Diseases, December 7-9, 2014, Chicago, Illinois.
- Deaton, M.K., Spear, A., Faaberg, K.S.. and Pegan, S.D.. 2014. Porcine reproductive and respiratory syndrome virus core vOTU domains display substrate preferences that vary with viral strain. S5.O-09. XIIIth International Nidovirus Symposium, Salamanca, Spain.
- Dekkers, JCM, RRR Rowland, J Lunney, G Plastow, J Harding, S Bishop, B Kemp. 2014. Genetic basis or host response to PRRS virus infection in Pigs. Pp. 85-89 in Volume 1, Proceeding 23rd International Pig Veterinary Society Congress. <http://en.engormix.com/MA-pig-industry/health/articles/genetic-basis-host-response-t3199/165-p0.htm>
- Diaz A, Culhane S. Sreevatsan S. Torremorell M. Influenza H1N1 and H3N2 co-infection in pigs after weaning. CRWAD, Chicago, IL 2014 (Accepted for presentation)
- Diaz A, Enomoto S, Corzo C, Culhane M, Sreevatsan S, Torremorell M (2014). Influenza A virus infection and diversity in commercial pig herds. Proc Am Assoc Swine Vet, Dallas, USA, p:40.
- Diaz A. Culhane M. Sreevatsan S. Torremorell M. Complete genome characterization of influenza A virus throughout a year of infection in a breeding herd using next generation sequencing technologies. 23rd IPVS Congress. Cancun, Mexico 2014.
- Diaz A. Culhane M. Sreevatsan S. Torremorell M. Dynamics of co-circulating H1N1 and H3N2 influenza A virus in a cohort of pigs after weaning. AASV meeting 2015. Orlando, FL 2015 (Accepted for presentation)
- Diaz A. Torremorell M. Corzo C. Culhane M. Sreevatsan S. Influenza A virus infection and transmission in pigs after weaning. 23rd IPVS Congress. Cancun, Mexico 2014.
- Diaz A. Torremorell M. Corzo C. Culhane M. Sreevatsan S. Influenza A virus infection and transmission in pigs after weaning. MISM Influenza workshop. Fogarty International Center. NIH. Bethesda, MD. 2014
- Diaz A. Torremorell M. Culhane M. Sreevatsan S. Complete genome characterization of influenza A virus in sow herds. MISM Influenza workshop. Fogarty International Center. NIH. Bethesda, MD. 2014
- Diaz A. Torremorell M. Culhane M. Temporal genetic characterization of influenza A virus in swine breeding herds. 23rd IPVS Congress. Cancun, Mexico 2014.

- Dunkelberger JR, Ho CS, Hess A, Lunney JK, Dekkers JCM. 2013. Predicting swine MHC haplotypes from high-density SNP genotypes. . Abstract, NA PRRS Symp. 2013.
- Dunkelberger, J. R., N. J. Boddicker, J. M. Young, R. R. R. Rowland, and J. C. M. Dekkers. 2013. Pigs Selected for Increased Feed Efficiency are less affected by experimental infection with the PRRSv. Proc. A. D. Lemman Swine Conference. University of Minnesota, College of Veterinary Medicine, Minneapolis, MN (p186).
- Dunkelberger, JR, CS Ho, AS Hess, JK Lunney, JCM Dekkers. Predicting swine MHC haplotypes from high-density SNP genotypes. In: Journal of Animal Sciences, 92(E-Suppl. 2):94. ADSA®-ASAS Joint Midwest Meeting. Des Moines, IA, USA, 2014.
- Dvorak CMT, Stone S, Rovira A, Levis I, Brown S, Turner M, Hough S, Snider, Murtaugh MP. 2014. Porcine epidemic diarrhea virus: immunity following feedback. Allen D Lemman Swine Conference, Recent Research Reports, vol 41, p 12.
- Effertz. K and Ramamoorthy.S. Inter-species transmission of Torque Teno Sus viruses. March 2014. Proceedings of the 2014 NDAES, Vol 68 Mar 2014. Valley city, ND
- Eisley CJ, Koltes J, Fritz E, Choi I, Boddicker N, Reecy J, Lunney J, Carpenter S, Tuggle CK, Liu P, Dekkers JCM. 2013. Analysis of gene expression in a region associated with host response to porcine reproductive and respiratory syndrome virus challenge. NA PRRS Symp. 2013.
- Eisley CJ, Koltes J, Fritz E, Choi I, Boddicker N, Reecy J, Lunney J, Carpenter S, Tuggle CK, Liu P, Dekkers JCM. 2014. Analysis of gene expression in a region associated with host response to porcine reproductive and respiratory syndrome virus challenge. PAG P592 -
- Ertl J, M. Culhane, A. Rovira, M. Torremorell. PEDV surveillance at the Minnesota pork congress. International Pig Veterinary Society Congress, 2014. Cancun, Mexico.
- Evans AB, Dorman KS, Loyd H, Lunney JK, Rowland RRR, Carpenter S. 2013.
- Faaberg, K.S., Deaton, M. K., Kappes, M. A., Spear, A., Lager, K. M., and Pegan, S. D.. 2013. Multifunctional role of porcine reproductive and respiratory syndrome virus nonstructural protein 2. Conference of Research Workers in Animal Diseases, Chicago, IL, USA.
- Fritz-Waters E, Koltes JE, Choi I, Serão NVL, Schroyen M, Lunney JK, Dekkers JCM, Tuggle CK, Carpenter S, JM Reecy. 2014. Identification of a putative quantitative trait nucleotide (QTN) for host response to Porcine Respiratory and Reproductive Syndrome (PRRS) virus infection. PAG P599
- G.J. Renukaradhya. Differential expression of DAP12 molecule and its associated receptors in the lungs of inactivated influenza virus vaccinated pigs challenged with a swine influenza virus. 94th Annual CWRAD meeting, December 8-10, 2013. Chicago, IL. Poster# 064P.
- G.J. Renukaradhya. PLGA nanoparticle-entrapped adjuvanted inactivated porcine reproductive and respiratory syndrome virus mucosal vaccine elicits cross-protective immunity in the respiratory tract of pigs. 101st Annual Meeting, The American Association of Immunologists, May 2 - 6, 2014, Pittsburg, PA, Abstract 141.26 (VAC7P.981).
- G.J. Renukaradhya. TREM2 differential expression is associated with BAL cells that express high levels of ARG-1. 101st Annual Meeting, The American Association of Immunologists, May 2 - 6, 2014, Pittsburg, PA, Abstract 207.16 (VET2P.1044).

- Gauger, P.C., Dias, A., Vincent, A.L., Kitikoon, P., Campbell, B.A., Zhang, J., Baker, R.B. 2013. Influenza A virus endemic circulation in neonatal and nursery pigs in a United States commercial swine farm. 23rd International Pig Veterinary Society Congress, June 8-11, 2014, Cancun, Mexico.
- Goede D, R. Robbins, L. Dufresne, M. Engle, A. Rovira, R. Morrison. Detection of porcine epidemic diarrhea virus in air samples at varying distances to epidemic farms in Oklahoma. AASV Annual Meeting, 2014. Dallas, TX, USA.
- Han M., and D. Yoo. 2014. Identification of a conserved IFN regulatory motif in PRRSV nsp1 $\beta$  protein. 1st International Symposium on Vaccines Against Antigenetically Variable Viruses. Ames IA. June 18-20.
- Han, M., and D. Yoo. 2014. The SAP-like domain in nsp1 $\beta$  protein of PRRSV and its role for IFN regulation. XIIIth International Nidovirus Symposium. Salamanca, Spain, June 1-6.
- Han, M., C. Kim, R. R. Rowland, Y. Fang, D. Kim, and D. Yoo. 2014. Biogenesis of non-structural protein 1 (nsp1) and nsp1-mediated type I interferon modulation in arteriviruses. 1st International Symposium on Vaccines Against Antigenetically Variable Viruses. Ames IA. June 18-20.
- Han, M., C. Kim, R. R. Rowland, Y. Fang, D. Kim, and D. Yoo. 2014. Molecular basis for non-structural protein 1-mediated type I interferon modulation in arteriviruses. XIIIth International Nidovirus Symposium. Salamanca, Spain, June 1-6.
- Han, M., C. Kim, Y. Sun, D. Kim, R.R. Rowland, Y. Fang, D. Yoo. 2013. Biogenesis of non-structural protein 1 of arteriviruses and their role in host innate immunity. North American PRRS Symposium. Chicago, IL, Dec 7-8.
- Han, M., C. Kim, Y. Sun, D. Kim, R.R. Rowland, Y. Fang, D. Yoo. 2013. Non-structural protein 1-mediated interferon modulation as a common strategy for porcine, equine, murine, and simian arteriviruses. 94th CRWAD, Chicago, IL, Dec. 8-10. (This paper was selected and awarded as the Graduate Student Prize Winner of The American College of Veterinary Microbiologists. Oral Presentation)
- Harding J, Ladinig A, Ashley C, Lunney J, Plastow G. 2013. Predictors of fetal survival following PRRSV challenge. NA PRRS Symp 2013.
- Herrmann, MS, M Niederwerder, NVL Serão, M Kerrigan, RRR Rowland, JK Lunney, JCM Dekkers. 2014. SSC4 WUR Genotype and Vaccination Effect on Nursery Pigs Co-infected with PRRSV and PCV2b. Proc. 10th World Congress Genetics Applied to Livestock Production (2014 WCGALP). Vancouver, Canada
- Hess AS, Tribble BR, Wang Y, Boddicker NJ, Rowland RRR, Lunney JK, Dekkers JCM. 2013. Factors Associated With N-specific IgG Response in Piglets Experimentally Infected with Porcine Reproductive and Respiratory Syndrome Virus. 2013 Leman Conference p183.
- Hess, A, B Tribble, Y Wang, N Boddicker, RRR Rowland, JK Lunney and JCM Dekkers. 2014. Factors associated with N-specific IgG response in piglets experimentally infected with porcine reproductive and respiratory syndrome virus. AASV.
- Hess, A, N Boddicker, RRR Rowland, JK Lunney and JCM Dekkers. 2014. Validation of the Effects of a SNP on SSC4 Associated with Viral Load and Weight Gain in Piglets Experimentally Infected with PRRS virus. Midwest Animal Science (MWAS) meetings

- Hess, AS, NJ Boddicker, RRR Rowland, JK Lunney, GS Plastow, JCM Dekkers. 2014. Genetic Parameters and Effects for a Major QTL of Piglets Experimentally Infected with a Second Porcine Reproductive and Respiratory Syndrome Virus. 2014 WCGALP.
- Hiremath, J, B. Binjawadagi, K. Ouyang, S. Dhakal, C. Manickam, V. Dwivedi, and
- Hiremath, J, K. Ouyang, B. Binjawadagi, C. Manickam, S. Dhakal, V. Dwivedi, and
- Iyer, A, Bailey, J, Renukaradhya, G.J, Lin, Y, Nguyen, H, and Brutkiewicz, R.R. Inhibition of Cd1d-mediated antigen presentation by the TGF- $\beta$ /Smad signaling pathway. 101st Annual Meeting, The American Association of Immunologists, May 2 - 6, 2014, Pittsburg, PA, Abstract 111.14 (APP3P.113).
- Junru Cui, Caitlin M O'Connell, J. Smyth, Paulo Verardi, Antonio Garmendia (2014). Pilot Studies in Swine T cell epitope mosaic vaccines expressing ORF5 of porcine reproductive respiratory syndrome virus. 8th Annual Vaccine Renaissance Conference, Providence, Rhode Island.
- Junru Cui, Caitlin O'Connell, Joan Smyth, Paulo Verardi, Antonio Garmendia (2014). Pilot Studies in Swine of a Novel T cell Epitope Mosaic DNA Vaccine Expressing ORF5 Protein of Porcine Reproductive and Respiratory Syndrome Virus (PRRSV). Graduate Student Research Forum, CAHNR, UCONN.
- Kalpanie Bandara, Kara Rogers, Milton Levin, Sylvain De Guise and Guillermo Risatti (2014). A potential role for PRRSV non-structural protein 3 (NSP3) in modulation of apoptosis during infection. Graduate Student Research Forum, CAHNR, UCONN.
- Kehrli, Jr., M.E., Vincent, A.L., Loving, C.L., Lager, K.M., 2013. Swine influenza virus vaccine research and technology: What does the future hold and what are our next steps? Annual Swine Disease Conference for Swine Practitioners. Iowa State University, Ames, IA, pp. 16-20.
- Kim, C., M. Han, and D. Yoo. 2014. Genetic characterization of a field strain of the lactate dehydrogenase-elevating virus and comparative analysis with other arteriviruses. XIIIth International Nidovirus Symposium. Salamanca, Spain, June 1-6.
- Kim, C., M. Han, D. Yoo. 2013. Genetic characterization of the Urbana strain of lactate dehydrogenase-elevating virus and comparative analyses with other member viruses in the family Arteriviridae. 94th CRWAD, Chicago, IL, Dec. 8-10.
- Kittawornrat A, Wang C, Anderson G, Ballagi A, Broes A, Carman S, Doolittle K, Galeota J, Johnson J, Lizano S, Nelson E, Patnayak D, Pogradichniy R, Rice A, Scherba G, Zimmerman J. Ring test evaluation for the detection of PRRSV antibody in oral fluid specimens using a commercial PRRSV serum antibody ELISA. Proceedings of the 44th annual meeting of the American Association of Swine Veterinarians. March 3, 2013, San Diego, California, p.61
- Ladinig A, Harding J, Ashley C, Lunney J, Plastow GS. 2013. Exploring cytokine profiles and PBMC subsets following PRRSV infection in pregnant gilts infected. NA PRRS Symp. 2013.
- Lager, K.M., Brockmeier, S., Faaberg, K.S., Miller, L.C., Loving, C.L., Yang, H.C., Jolie, R. (2014). HP-PRRSV challenge in pigs vaccinated with Porcilis® PRRS. 23th International Pig Veterinary Society Congress 2014 (IPVS 2014), June 8-11, 2014, Cancun, Mexico.
- Laoye MO, Vemulapalli R, Pogradichniy RM, Lenz SD, Ragland D. Immunogenic potential of the E protein of porcine respiratory and respiratory syndrome virus. Proceedings, 2013 North American PRRS Symposium. Chicago, Illinois, 2013, p.16.

- Lawson, S., F. Okda, X. Liu, A. Singrey, T. Clement, J. Christopher-Hennings, E.A. Nelson. Development of a fluorescent microsphere immunoassay (FMIA) and a blocking ELISA for detection of antibodies against porcine epidemic diarrhea virus (PEDV). AAVLD, Oct. 2014.
- Lee C, Allerson M, Torremorell M (2014). The impact of pooling nasal swab samples on the diagnostic sensitivity of influenza A virus RRT-PCR. Proc Am Assoc Swine Vet, Dallas, USA, p:299.
- Lei Zhou, Xiaorong Yang, Yuan Tian, Shuoyan Yin, Gang Geng, Xinna Ge, Xin Guo, Hanchun Yang. Genetic diversity analysis of genotype 2 porcine reproductive and respiratory syndrome viruses emerging in recent years in China. CRWAD, 2014, Chicago, Illinois.
- Li Wang, Lei Zhou\*, Han Zhang, Xinna Ge, Xin Guo, Hanchun Yang. Nsp2 recruits cellular protein BAG6 to target itself, mediate ER-stressed apoptosis and promote PRRSV replication. North American PRRS Symposium, 2014, Chicago, Illinois.
- Lunney JK. 2014. Searching for genomic control of pig viral vaccine and disease responses. PAG GeneSeek workshop.
- Lunney JK. 2014. Genomics research consortia: Addressing animal disease problems from phenotype and genotype to application. PAG NRSP-8 workshop. W802.
- Lunney, JK, RRR Rowland, B Tribble, I Choi, SM Abrams, CJ Souza, JM Reecy, E Fritz-Waters, JE Koltas, C Easley, CK Tuggle, A Hess, J Dunkelberger, JCM Dekkers, NJ Boddicker, JP Steibel, CW Ernst, L Guan, H Bao, A Kommadath, P Stothard, GS Plastow, A Ladinig, JCS Harding. Exploring genetic control of swine responses to viral diseases. 34th International Society for Animal Genetics (ISAG) Conference, Xi'an, China.
- Miller L. C., Jiang, Z., Sang, Y., Harhay, G. P., and Lager, K. M. (2013) Evolutionary characterization of pig interferon-inducible transmembrane gene family and member expression dynamics in tracheobronchial lymph nodes of pigs infected with swine respiratory disease viruses [abstract]. 2013 Conference of Research Workers in Animal Diseases (CRWAD) Meeting, December 8–10, Chicago, Illinois.
- Miller, L.C., Crawford, K., Lager, K.M. (2014) Performance assessment of a real-time polymerase chain reaction assay for porcine epidemic diarrhea virus to assess PEDV transmission in growing pigs. Conference for Research Workers in Animal Diseases, December 7-9, 2014, Chicago, Illinois.
- Miller, L.C., Jiang, Z., Sang, Y., Harhay, G.P., Lager, K.M. (2014). Evolutionary characterization of pig interferon-inducible transmembrane gene family and member expression dynamics in tracheobronchial lymph nodes of pigs infected with swine respiratory disease viruses. International Plant & Animal Genome XXII. P595.
- Murtaugh M, C. Dvorak, S. Stone, A. Rovira, I. Levis, S. Brown, M. Turner, S. Hough. PEDV: immunity following feedback. International Pig Veterinary Society Congress, 2014. Cancun, Mexico.
- Murtaugh M, Rahe M, Robinson S, Taylor J, Jenkins M. 2014. Identification of PRRSV cross-neutralizing memory B cells. J. Immunol. 192:208.14.
- Ouyang, K. B. Binjawadagi, A. Kittawornrat, C. Olsen, J. Hiremath, N. Elkalifa, R. Schleppi, J. Wu, J.J. Zimmerman, and G.J. Renukaradhya. Development and validation of an assay to detect porcine reproductive and respiratory syndrome virus specific

neutralizing antibody titers in pig oral fluid samples. 94th Annual CWRAD meeting, December 8-10, 2013. Chicago, IL. Poster# 066P.

- Rajão DS, Loving CL, Gauger PC, Kitikoon P, Vincent AL. Influenza A virus hemagglutinin protein subunit vaccine elicits vaccine-associated enhanced respiratory disease in pigs. American Society for Virology 33rd Annual Meeting, June 21-25, 2014, Fort Collins, Colorado.
- Renukaradhya, G. J, C. Manickam, V. Dwivedi, K. Ouyang, B. Binjawadagi, K. Henn, J. Hiremath, S. Raghunath, P. Crittenden, and M. Khatri. Natural killer T cell adjuvant-based inactivated swine influenza virus vaccine enhances the viral load and suppresses the host immune response to pandemic 2009 H1N1 influenza virus challenge in pigs. 100th Annual Meeting, The American Association of Immunologists, May 3 - 7, 2013, Honolulu, Hawaii. Abstract 141.26 (P6093).
- Renukaradhya, G. J, Ouyang K, S. Woodiga, V. Dwivedi, C. Marion, A. Singh, B. Binjawadagi, J. Hiremath, C. Manickam, R. Schelappi, M. Khatri, and S. King. Pretreatment of epithelial cells with live *Streptococcus pneumoniae* had no detectable effect on influenza A virus replication in vitro. 101st Annual Meeting, The American Association of Immunologists, May 2 - 6, 2014, Pittsburg, PA, Abstract 66.13 (MPF1P.774).
- Renukaradhya, G. J., C. Manickam, V. Dwivedi, K. Ouyang, B. Binjawadagi, K. Henn, J. Hiremath, S. Raghunath, P. Crittenden, and M. Khatri. Natural killer T cell adjuvant-based inactivated swine influenza virus vaccine enhances the viral load and suppresses the host immune response to pandemic 2009 H1N1 influenza virus challenge in pigs. 16th International Congress of Mucosal Immunology, July 17 - 20, 2013, The Westin Bayshore, Vancouver BC, Canada. Abstract F31.
- Roady, P.J., Calzada-Nova, G., Chen, W-Y., Zuckermann, F.A. 2014. Objective Assessment of the Extent of Lung Lesions in Pigs Infected with Porcine Reproductive and Respiratory Syndrome Virus, a Novel Approach. Veterinary Diagnostic Laboratory and Dept. of Pathobiology, College of Veterinary Medicine, University of Illinois, Urbana, IL. North American PRRS Symposium. Chicago, IL, Dec 7-8.
- Schroyen M, Easley C, Fritz-Waters E, Choi I, Koltjes JE, Boddicker N, Reecy JM, Lunney JK, Carpenter S, Liu P, Dekkers JCM, Tuggle CK. 2014. GO annotation and WGCNA clustering of RNAseq data in response to PRRS. 34th ISAG Conference, Xi'an, China.
- Serão, NVL, M Niederwerder, MS Herrmann, M Kerrigan, RRR Rowland, JK Lunney, JCM Dekkers. 2014. Response to PRRSV and PCV2b is Affected by Vaccination and WUR Genotype in Nursery Pigs. American Society of Animal Science Joint Annual Meeting.
- Sina R, Moore B, Lazar V, Musarra A, Pogradichnyy RM. Real time RT-PCR; Detection of Porcine Reproductive and Respiratory Syndrome Virus Comparison Study. Proceedings, 2013 North American PRRS Symposium. Chicago, Illinois, 2013, p.15.
- Singrey, A., S. Lawson, F. Okda, X. Liu, T. Clement, J. Nelson, J. Christopher-Hennings, E.A. Nelson. Development and diagnostic application of monoclonal antibodies against porcine epidemic diarrhea virus (PEDV). AAVLD, Oct. 2014.
- Souza CJH, Choi I, Araujo KPC, Abrams SM, Kerrigan M, Rowland RRR, Lunney JK. 2013. Comparative serum immune responses of pigs after a challenge with porcine reproductive and respiratory syndrome virus (PRRSV). NA PRRS Symp. 2013.

- Stadejek T, Balka T, Bálint A, Duinhof T, Murtaugh M. 2014. The origin and evolution of European PRRSV Type 2 strains. 6th Euro Symp Porcine Hlth Management. Sorrento, 8 May 2014.
- Velez-Irizarry D, Ernst CW, Lunney JK, Raney NE, Steibel JP. 2014. Prediction of porcine reproductive and respiratory syndrome virus serum viral level phenotype from gene expression profiles. MWAS.
- Wang,R., Y. Xiao, T. Opriessnig, Y. Yu, Y. Nan, Z. Ma, P. Halbur, and Y. Zhang. 2013: Enhanced Neutralizing Antibody Generation by an Interferon-Inducing PRRSV Strain. PRRS Symp.
- Wier, B.C., C.M.T. Dvorak, and M.P. Murtaugh. 2014. Development and validation of ELISA testing for serological monitoring and surveillance of porcine epidemic diarrhea virus. Proc. Amer. Assoc. Swine Vet. 45:371.
- Xiuqing Wang, Hanmo Zhang, Alex M. Abel. 2014. Role of dsRNA dependent PKR in PRRSV replication. 33rd ASV, Fort Collins, Colorado.
- Yoo, D. 2013. Type I interferon response during PRRS infection. North American PRRS Symposium. Chicago, IL, Dec 7-8.
- Yoo, D. 2014. Evasion of PRRS virus from host innate immunity. International Symposium on PRRS Prevention and Control 2014. Luoyang, Henan, China. Oct 24-25.
- Zhang, Z., K. Rossow, T. Otterson, and M.P. Murtaugh. 2014. Differential diagnosis of PRRS infection and vaccination by one-step real-time RT-PCR. Proc. Amer. Assoc. Swine Vet. 45:29-31.
- Zuckermann, F.A., Calzada-Nova, G., Husmann, R., and Villamar, M. 2014. Assessment of cross-protective immunity elicited by a novel PRRS live virus vaccine against a highly virulent type 2 PRRS belonging to lineage 1. Department of Pathobiology, University of Illinois at Urbana-Champaign. North American PRRS Symposium. Chicago, IL, Dec 7-8

### 3) Book chapters or monographs

- Renukaradhya GJ, and Shaila. Host Immune Responses Against Peste des Petits Ruminants Virus. Springer, 2013.
- Tripp RA, Mark Tompkins S. Antiviral effects of inhibiting host gene expression. Curr Top Microbiol Immunol. 2015;386:459-77. doi:10.1007/82\_2014\_409. PMID: 25007848.
- Tripp RA, Tompkins SM. Virus-vectored influenza virus vaccines. Viruses. 2014 Aug 7;6(8):3055-79. doi: 10.3390/v6083055. PMID: 25105278.
- Zhang J, Gauger PC. 2014. Isolation of swine influenza virus in cell cultures and embryonated chicken eggs. In: Animal Influenza Virus (2nd Edition). Edited by Erica Spackman. Methods Mol Biol 1161:265-276
- Zhang J, Harmon KM. 2014. RNA extraction from swine samples and detection of influenza A virus in swine by real-time RT-PCR. In: Animal Influenza Virus (2nd Edition). Edited by Erica Spackman. Methods Mol Biol 1161:277-293

## E. CURRENT FUNDING SOURCES FOR PRRSV RESEARCH

XJ Meng	National Pork Board	2013-2014	PRRS Vaccinology Literature Review
XJ Meng, Sakthivel Subramaniam, Tanja Opriessnig	USDA-NIFA	2013-2017	PRRSV T cell immunity
Elankumaran Subbiah, XJ Meng	USDA-NIFA	2012-2016	A multicomponent virus vectored vaccine for PRRSV and other swine pathogens
XJ Meng, YW Huang, Tanja Opriessnig	USDA-NIFA	2011-2015	Engineering PRRSV Vaccines that confer heterologous protection
XJ Meng, YW Huang	Zoetis Inc	2010-2014	PRRSV vaccine development

Ramamoorthy, S.; Webb. B. Nara. P	Research ND - Venture funds	\$99,965	06.01.14 - 06.01.16	Homing in on “effective” antibody responses to enhance PRRSV prophylaxis
-----------------------------------	-----------------------------	----------	---------------------	--

Ying Fang and Renukaradhya Gourapura. Innovative strategies to enhance PRRSV specific innate and mucosal immunity: implication for development of broadly protective PRRSV vaccine. USDA-AFRI, February 2012 – February 2017

Renukaradhya Gourapura, Ying Fang and Daral Jackwood. Development of PRRS virus-like-particles containing nanoparticle vaccine and its evaluation in pigs. National Pork Board, December 2012 to May 2014.

Renukaradhya Gourapura. PRRS Vaccinology Literature Review. National Pork Board, August 2013 to June 2014.

Chang-Won Lee and Renukaradhya Gourapura (Multi-PIs). Universal Flu Vaccine by a Norovirus P Particle Platform. USDA-AFRI, January 2013-2018.

Hatch Multistate Project, NC229. Storrs Agricultural Experiment Station (Risatti).

Hatch Project, Storrs Agricultural Experiment Station (Garmendia).

Polyvalent T cell Mosaic Vaccine to Cross-Protect Swine Against Heterologous PRRSV Strains. USDA/NIFA Grant Number 2011 67015-30176 (Garmendia).

Yoo, D. (2013-2018), USDA NIFA-AFRI, \$500,000, Immune evasion of PRRS virus and a novel approach to vaccine design.

Yoo, D. (2013-2014), National Pork Board, \$50,000. Literature review PRRS -Virology.

Zuckermann, F. (2012-2013), National Pork Board. Viral structural components that enable vaccine-induced protective immunity against contemporary high morbidity and high mortality PRRS virus. \$125,303.

Boehringer Ingelheim Vetmedica

GBHLabs

Minnesota Pork Board

National Pork Board

State of Minnesota Rapid Agricultural Response Fund

University of Minnesota Swine Disease Eradication Center

University of Minnesota, College of Veterinary Medicine Signature Programs

USDA Animal Health funds

USDA/NIFA

Zoetis

KSU:

Fang, Y. A novel arterivirus protein and expression mechanism: implication in vaccine and companion diagnostic assay development (USDA-NIFA 2014-06403, 01/01/2015 – 12/31/2019)

Fang, Y. In vitro evaluation of an improve PRRS vaccine (private company, 12/01/2014-11/30/2015)

Fang, Y. In vivo evaluation of a parainfluenza virus 5 (PIV5)-vectored candidate PRRS vaccine (University of Georgia Research Foundation, 07/01/2014 – 06/30/2015)

Fang, Y. Development of vaccines against porcine epidemic diarrhea virus (K-State Research Foundation, 07/14/2014 – 03/15/2015)

Fang, Y., R. Gourapura, W. Zhang, J. Christopher-Hennings, E. Nelson. Innovative strategies to enhance PRRSV specific innate and mucosal immunity. (USDA-NIFA 2012-67015-21823, 05/01/12-04/30/17).

Fang, Y., W. Zhang, D. Knusen. Development of a broadly protective PRRS vaccine candidate: Application of non-toxic enterotoxin and E. coli as the adjuvant-delivery system (National Pork Board. 01/01/13-05/31/14).

Hesse et al, 2013-2014, National Pork Board, Determination of the sites of tissue localization, routes of viral shedding, duration of virus carriage, kinetics of antibody response, and

potential of aerosol transmission of Porcine Deltacoronavirus (PDCoV) following inoculation of nursing pigs and their dams. \$ 168,693.

Rowland NBAF Transition Funding for the study of ASF, RVF and CSF, 2014-2015, \$1.2 million.

Yoo, Rowland, USDA NIFA 2013-2017, Immune evasion of PRRS virus and a novel strategy for vaccine development, 2013-2017, approximately \$60,000 to the Rowland lab.

Dekkers, Rowland, Lunney, et al., USDA NIFA, 2012-2017, Genetically Improving Resistance of Pigs to PRRS Virus Infection, \$3 million, approximately \$800,000 to the Rowland lab.

Patience et al., 2010-2015, USDA NIFA, Improving biological nutrient use and thus feed efficiency in the U.S. pork industry through innovative scientific and extension approaches for a more sustainable production, \$65,000.

Rowland et al., 2010-2015, Specific Cooperative Agreement: KSU and USDA-ARS-ABADRU, \$400,000.

Sang, USDA NIFA AFRI Award No. 2013-67015-21236, 1013-2017, “Antiviral Regulation Underlying the Activation Status of Porcine Monocytic Innate Immune Cells”.

Sang, USDA NIFA AFRI, 2015-2017, Swine Immune Toolkit: Development of new immune reagents for swine health, vaccine and disease studies Joan Lunney (PD), Co-PDs: Aradhya Gourapura (OSU), Joanna Labresh (Kingfisher), Linda Wooldridge (UK), Mick Bailey (UK), Elankumaran Subbiah (VT), Yongming Sang (KSU); 01/01/2015-12/31/2017

China Agr University

- (1) National Key Basic Research Plan Grant (2014CB542700) from the Chinese Ministry of Science and Technology
- (2) The earmarked fund for Modern Agro-industry Technology Research System of China (CARS-36) from the Chinese Ministry of Agriculture
- (3) PoRRSCon EU 7th Framework programme (SICA) KBBE-2009-1-3-01
- (4) Key project of National Natural Science Funds from National Natural Science Foundation of China (31330077)

NADC :

- Brockmeier, Cheung, Faaberg, Lager, Miller, Loving, Vincent - USDA ARS Research Funds
- Sang, Rowland, Blecha, Miller – NIFA-AFRI - Antiviral regulation underlying the activation status of porcine monocytic innate immune cells
- Faaberg, Brockmeier – ARS - Parallel Monitoring Porcine Disease of Economic Importance in the United States and China
- Brockmeier – NPB-
- Faaberg – NPB - Defining a Novel Structural Component of Porcine Reproductive and Respiratory Syndrome Virus and its Role in Disease Pathogenesis
- Faaberg – NPB - Evaluation of a PRRSV Modified Live DIVA Vaccine.

- Lager- USDA-APHIS. Identify Mechanisms of Viral Pathogenesis, Transmission, and Immunity of Porcine Epidemic Diarrhea Virus and Other Emerging Swine Coronaviruses.
- Vincent - USDA Swine Influenza Virus Surveillance System: Continuation of In vivo pathogenesis and transmission and associated in vitro studies. 03/2014 - 08/2015 with USDA-APHIS-VS. (\$500,000). The objectives are in vitro and in vivo studies of swine influenza viruses identified in the USDA Swine Influenza Virus (SIV) Surveillance System.
- Vincent - USDA Swine Influenza Virus Surveillance System: Computational evolutionary biology of whole genome sequences. 04/2012 - 09/2014 with USDA-APHIS-NVSL (\$201,018). The objective is to conduct computational evolutionary sequence analysis in the context of contemporary and historical SIV for determination of phylogenetic relationships, lineages, and reassortment events.
- Vincent - Characterization and utilization of a novel immune-compromised pig for biomedical modeling. 08/2013-06/2015 with Iowa State University Bailey Grant (\$28,774). The objective is to evaluate the pathogenesis of influenza A virus infection in immune-compromised pigs.
- Vincent - Characterization of the evolution of influenza A viruses (IAV) in swine and pathotyping of IAV in the natural host. 10/2013-09-2020 with NIH-Centers for Excellence in Influenza Research and Surveillance (\$1,750,000). The objectives are to monitor the evolution of influenza A viruses in swine, objectively quantify antigenic changes important for population immunity, and assess the risk of emerging or evolving strains of IAV in the swine host.

#### BARDC:

Dekkers J, Lunney J, 11 others. USDA NIFA Translational Genomics grant # 2013-68004-20362 on " Genetically Improving Resistance of Pigs to PRRS Virus Infection." 2013-17.

Lunney JK, J Reecy. "PRRS Host Genetics Consortium: A proposal to develop a consortium to study the role of host genetics and resistance to PRRSV." National Pork Board grant #12-061. 2012-14.

Lunney JK, J Dekkers, J Reecy. "Impact of host immunity and genetics on persistence of PRRS virus in tonsils." National Pork Board grant #14-223. 2014-15.

Lunney JK, H Kim. Cooperative agreement between USDA ARS and Korean National Institute of Animal Science (NIAS), Rural Development Administration (RDA) Swine Science Division for "Improvement of pig production using PRRS-resistant gene marker" 2014-16.

Lunney JK, Ernst C, Honavar V, Jiang Z, Pogranichniy R, Steibel JP, Tuggle C. USDA AFRI/NIFA Animal Genome, Genetics, and Breeding Program. #2010-65205-20433 on "Identifying porcine genes and gene networks involved in effective response to PRRS virus using functional genomics and systems biology." 2010-14.

Moore S (Plastow G), Lunney JK, Kemp B. Genome Alberta Applied Livestock Genomics Program (ALGP) #29. "Canadian Component of the PRRS Host Genetics Consortium (PHGC)." 2010-14.

Plastow G, Kemp B, Harding J. Genome Canada grant (coPI) on "Application of genomics to improving swine health and welfare." 2011-14.

#### UGA:

NIH R01GM102546-01

09/01/2012 – 08/31/2016

Title: Determination of Markers of High Pathogenicity in Influenza

The major goal of this contract is to develop a SERS-based detection to identify influenza virus and specifically genetic features associated with.

Total Direct costs: \$1,480,150

HHSN272201400004C

04/01/14 – 03/31/21

Title: NIAID Center of Excellence for Influenza Research and Surveillance (contract)

The major goal of this contract is to understand how Swine Influenza Virus evolves in swine herds and crosses the animal-human interface.

Total Direct costs: \$43,000,000

SDSU:

Diel, D., H. Vu, F. Osorio, E.A. Nelson, J. Christopher-Hennings. Evaluation of immunodominant B- and T-cell epitopes as inducers of protective immunity against porcine reproductive and respiratory syndrome virus. National Pork Board. \$83,094. 10/1/14 to 9/31/15.

Nelson, E.A., S. Lawson, A. Singrey, T. Clement, J. Christopher-Hennings. Development of reagents and serological assays for Porcine Deltacoronavirus (PDCoV). National Pork Board. \$29,390. 6/1/14 to 12/1/14.

Clement, T., A. Singrey, S. Lawson, J. Christopher-Hennings and E.A. Nelson. Duration and level of PEDV neutralizing antibodies for clinical protection using feedback protocols. National Pork Board. \$48,750. 12/15/13 to 12/14/14.

Nelson, E.A., A. Singrey, S. Lawson, T. Clement and J. Christopher-Hennings. PEDV diagnostic approaches to assess sow immunity and piglet protection. National Pork Board. \$41,900. 5/1/14 to 4/30/15.

Thaler, B., C. Lavesque, J. Christopher-Hennings, E. Nelson, J. Clapper. Efficacy of soybean meal in reducing the effect of a PRRSV challenge in pigs. South Dakota Soybean and Promotion Council FY15. \$131,074. 7/1/14-7/1/15.

Wang, X., Determining Virus-Like Particle (Vlp) Feasibility For New Porcine Reproductive And Respiratory Syndrome Virus (PRRSV) Vaccines. USDA AFRI NIFA. 5/12-4/15. \$150,000.

ISU:

Balasuriya U. Cook RF, Zhang J, Gauger P, Snijder E. Development of recombinant vaccines against porcine reproductive and respiratory syndrome (PRRS): equine arteritis virus-vectored chimeric vaccines against PRRS. Merial Animal Health. \$362,109.

Gauger P, Vincent A, Kitikoon P, Baker RB, Zhang J, Wang C. Detection and characterization of influenza A virus endemic circulation in neonatal and nursery pigs in farms using routine influenza vaccination. Iowa Pork Producers Association. \$70,000.

Gauger P, Zhang J, Magstadt D. Evaluation of cross-protection in Foster<sup>TM</sup> PRRSV vaccinated conventional swine challenged with a contemporary, heterologous lineage 1 PRRSV. Zoetis. \$105,892.

Gauger P, Magstadt D, Zhang J. Part 1: Evaluation of Foster<sup>TM</sup> PRRSV serum neutralizing antibodies against contemporary PRRSV and challenge of conventional, naïve pigs with contemporary PRRSV. Part 2: Evaluation of cross-protection in experimental PRRSV vaccinated conventional swine challenged with a contemporary, heterologous PRRSV. Part 3: Evaluation of shedding in experimental PRRSV-vaccinated grower pigs challenged with a heterologous PRRSV. Zoetis. \$162,629.

Gimenez-Lirola L, Yoon KJ, Johnson J, Madson D, Main R, Wang C, Zhang J, Zimmerman J. Defining PEDV maternal humoral immunity and correlates of neonatal protection. National Pork Board. \$107,711.

Gourapura R, Gauger P, Zhang J, Minton W. Evaluation of mucosal B cell response to PEDV in infected sows. National Pork Board. \$81,442.

Holtkamp D, Baker R, McKean J, Main R, Ramirez A. Development of a PRRS outbreak investigation and data management analysis program for breeding herds in regional PRRSV projects in Iowa. Iowa Pork Producers Association. \$47,129.

Holtkamp D, Thomas P, Ellingson J, Ramirez A, Karriker L, Zhang J. Evaluation of the efficacy of Stalosan® F for inactivating porcine epidemic diarrhea virus (PEDV) in swine feces on the surface of trailers used to haul live pigs. National Pork Board. \$33,726.

Holtkamp D, Thomas P, Ellingson J, Ramirez A, Karriker L, Zhang J. Evaluation of time and temperature sufficient to kill PEDV in swine feces on metal surfaces. National Pork Board. \$25,496.

Holtkamp D, Thomas P, Karriker L, Ramirez A, Zhang J, Halbur P, Ellingson J, Jones B, Beaven M, Vanderkooy C. Evaluation of Accel® to inactivate porcine epidemic diarrhea virus in swine feces on metal surfaces found in commercial hog trailers. Ogena Solutions Canada Corp. \$37,668.

Holtkamp DJ, Baker RB, Main R, Ramirez A. Development of PRRS outbreak investigation and data management/analysis program for breeding herds in regional PRRSV projects in Iowa. Iowa Pork Producers Association. \$12,026.

Holtkamp DJ, Thomas P, Ramirez A, Karriker L, Zhang J, Halbur P, Ellingson J. Evaluation of combinations of time and temperature sufficient to kill porcine epidemic diarrhea virus (PEDV)

on the metal surface following a wash with detergent and disinfection with Synergize®. PIC North America. \$41,420.

Madson D, Stevenson G, Yoon KJ, Arruda P, Burrough E, Cooper V, Gauger P, Harmon K, Pillatzki A, Schwartz K, Zhang J. Characterization of the pathogenesis of porcine epidemic diarrhea virus (PEDV) in neonates and weaned pigs and generation of reference diagnostic specimens. Iowa Pork Producers Association. \$113,920.

Madson D, Yoon KJ, Kuster C, Zhang J. Porcine epidemic diarrhea virus disease progression and shedding in mature boars post oral feedback inoculation. Iowa Pork Producers Association. \$25,000.

Main R, Mueller K, Perez A, Polson D, Connor J, Holtkamp D, Roth J, Anderson G, Hennings J, Collins J. Linking veterinary diagnostic laboratory submissions and corresponding PEDV test results to spatiotemporal mapping tools: the future of disease management, control and elimination. National Pork Board. \$130,000.

Pillatzki A, Gauger P, Madson D, Burrough E, Zhang J, Magstadt D, Arruda P, Yoon KJ, Stevenson G. Feed transmission of PEDV to neonatal piglets. American Association of Swine Practitioners. \$8,970.

Roth JA. A review of commercial influenza vaccines available for use in pigs. USDA APHIS. \$108,170.

Roth JA. Swine influenza A virus surveillance system project. USDA ARS. \$100,185.  
Woodworth J, Stark C, Hesse R, Main R, Zhang J, Dritz, S, Tokach M, Gauger P. 2014. Determining the impact of conditioning time and temperature in pelleted diets on PEDV survivability in complete swine diets. National Pork Board. \$130,519.

Yoon KJ, Stevenson G, Schwartz K, Burrough E, Cooper V, Madson D, Gauger P, Pillatzki A, Harmon K, Zhang J, Zimmerman J. Porcine Epidemic Diarrhea (PED) Disease: Development of tests and reagents for diagnosis and disease management. Iowa Pork Producers Association. \$77,769.

Yoon KJ, Zhang J, Li G. Better assessment of genetic and antigenic relationship among PRRS viruses and application of next-generation sequencing technology to characterization of PRRSV. Zoetis. \$100,000.

Yoon KJ, Zimmerman J, Main R, Harmon K, Johnson J, Gimenez-Lirola L. Oral fluid testing for cost-effective and efficient surveillance and control of porcine epidemic diarrhea virus in swine population. National Pork Board. \$63,226.

Zhang J, Chen Q, Gauger P, Madson D. Evaluation of the pathogenesis differences of PEDV original and variant strains and examination of the cross-protective immunity between two strains. Iowa Pork Producers Association. \$97,508.

Zhang J, Chen Q, Gauger P. In vitro evaluation of serological cross-reactivity and cross-neutralization between the PEDV original and variant strains. Zoetis. \$17,661.

Zhang J, Gauger P, Harmon K, Chen Q. Evaluation of commercial rapid PED, TGE, and Rota Ag Test Kits for detecting virus pathogens in porcine feces. Zoetis. \$24,590.

Zhang J, Gauger P, Li G, Main R. Development and evaluation of a live attenuated porcine epidemic diarrhea virus vaccine. Zoetis. \$340,241.

Zhang J, Gauger PC, Burrough ER, Madson DM, Gimenez-Lirola L, Yoon KJ. Effect of porcine epidemic diarrhea virus infectious doses on outcomes of infection in naïve neonatal piglets and weaned pigs. Iowa Pork Producers Association. \$57,603  
UMD:

University of Maryland:

Zhang, Yanjin; University of Maryland; [zhangyj@umd.edu](mailto:zhangyj@umd.edu)  
Seed grant from University of Maryland.