

# Chong Wang

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## EDUCATION

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Ph.D. **Statistics**, with minor in **Epidemiology**, Cornell University, Ithaca, NY, 08/2006

**Dissertation:** ROC Analysis for Cross-Sectional and Longitudinal Disease Diagnostic Data without a Gold Standard Test: Application to Johne's Disease in Dairy Cows  
Advisor: Bruce W. Turnbull

M.S. **Statistics**, Cornell University, Ithaca, NY, 12/2004

B.S. **Statistics and Probability**, Peking University, Beijing, P.R. China, 07/2001

## EMPLOYMENT

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|-------------------|--|
| 08/2015 – present | Associate Professor, Department of Veterinary Diagnostic and Production Animal Medicine, Iowa State University   |
| 08/2015 – present | Associate Professor, Department of Statistics, Iowa State University   |
| 01/2009 – 08/2015 | Assistant Professor, Department of Veterinary Diagnostic and Production Animal Medicine, Iowa State University   |
| 01/2009 – 08/2015 | Assistant Professor, Department of Statistics, Iowa State University   |
| 08/2007 – 12/2008 | Assistant Professor, Department of Biostatistics, University of Kentucky   |
| 08/2007 – 12/2008 | Assistant Professor, Department of Statistics, University of Kentucky  |
| 08/2006 – 05/2007 | Visiting Assistant Professor, Department of Mathematics, Cornell University  |
| 08/2006 – 07/2007 | Postdoctoral Associate with <u>Yrjö T. Gröhn</u> , Department of Population Medicine and Diagnostic Sciences, College of Veterinary Medicine, Cornell University |

## RESEARCH INTERESTS

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- Biostatistics and Epidemiology
- Design of Animal Disease Surveillance
- Systematic Reviews and Network Meta-analyses
- Bioinformatics
- Diagnostic Test Evaluation
- Development and Application of Statistical Methods in Veterinary Medicine

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**PEER-REVIEWED JOURNAL ARTICLES (\* Indicates Wang student)**


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188. \***Hu, D.**, Cheng, T.Y., \***Morris, P.**, Zimmerman, J., **Wang, C.** (2021) Active regional surveillance for early detection of exotic/emerging pathogens of swine: A comparison of statistical methods for farm selection, *Preventive Veterinary Medicine*, 187: 105233. DOI:10.1016/j.prevetmed.2020.105233. **Editor's Choice.**
187. \***Goren, E.**, **Wang, C.**, He, Z., Sheflin, A.M., Chiniquy, D., Prenni, J.E., Tringe, S., Schachtman, D.P., Liu, P. (2021) Feature selection and causal analysis for microbiome studies in the presence of confounding using standardization. *BMC Bioinformatics*, 22, 362. DOI:10.1186/s12859-021-04232-2
186. Cheng, T.Y., Henao-Diaz, A., Poonsuk, K., Buckley, A., van Geelen, A., Lager, K., Harmon, K., Gauger, P., **Wang, C.**, Ambagala, A., Zimmerman, J., Giménez-Lirola, L. (2021) Pseudorabies (Aujeszky's disease) virus DNA detection in swine nasal swab and oral fluid specimens using a gB-based real-time quantitative PCR. *Preventive Veterinary Medicine*, 189:105308. DOI:10.1016/j.prevetmed.2021.105308.
185. Clavijo, M.J., \***Hu, D.**, Krantz, S., Cano, J.P., Pereira Maróstica, T., Henao-Diaz, A., Poeta Silva, A.P.S., Hemker, D., Tapia, E., Zimmerman, S., Fano, E., Polson, D., Fitzgerald, R., Tucker, A., Main, R., **Wang, C.**, Zimmerman, J.J., Rotolo, M.L. (2021) Mycoplasma hyopneumoniae Surveillance in Pig Populations: Establishing Sampling Guidelines for Detection in Growing Pigs. *Journal of Clinical Microbiology*, 59(5):e03051-20. DOI:10.1128/JCM.03051-20.
184. Stock, M. L., Kleinhenz, M. D., Mazloom, R., Jaber-Douraki, M., Barth, L. A., Van Engen, N. K., Voris, E. A., **Wang, C.**, Coetzee, J. F. (2021). A field trial comparing four oral nonsteroidal anti-inflammatory drugs on controlling cautery dehorning pain and stress in calves. *Translational animal science*, 5(2), txab041. DOI:10.1093/tas/txab041.
183. Yim-Im, W., Huang, H., Park, J., **Wang, C.**, Calzada, G., Gauger, P., Harmon, K., Main, R., Zhang, J. (2021) Comparison of ZMAC and MARC-145 Cell Lines for Improving Porcine Reproductive and Respiratory Syndrome Virus Isolation from Clinical Samples. *Journal of Clinical Microbiology*, 18;59(3):e01757-20. DOI:10.1128/JCM.01757-20.
182. Overstreet, A.C., Ramer-Tait, A.E., Suchodolski, J.S., Hostetter, J.M., **Wang, C.**, Jergens, A. E., Phillips, G.J., Wannemuehler, M.J. (2021). Temporal Dynamics of Chronic Inflammation on the Cecal Microbiota in IL-10 Mice. *Frontiers in Immunology*, 11, 585431. DOI:10.3389/fimmu.2020.585431.
181. Cheng, T., Buckley, A., Van Geelen, A., Lager, K., Henao-Díaz, A., Poonsuk, K., Piñeyro, P., Baum, D., \***Ji, J.**, **Wang, C.**, Main, R., Zimmerman, J.J., Giménez-Lirola, L. (2020) Detection of pseudorabies virus antibody in swine oral fluid using a serum whole-virus indirect ELISA. *Journal of Veterinary Diagnostic Investigation*, 32(4):535-541. DOI:10.1177/1040638720924386.
180. McQuinn, E.R., Smith, S.A., Viall, A.K., **Wang, C.**, & LeVine, D.N. (2020). Neutrophil extracellular traps in stored canine red blood cell units. *Journal of Veterinary Internal Medicine*, 34(5), 1894–1902. DOI:10.1111/jvim.15876.

179. Trevisan, G., Linhares, L.C.M., Crim, B., Dubey, P., Schwartz, K.J., Burrough, E.R., **Wang, C.**, Main, R.G., Sundberg, P., Thurn, M., Lages, P.T.F., Corzo, C.A., Torrison, J., Henningson, J., Herrman, E., Hanzlicek, G.A., Raghavan, R., Marthaler, D., Greseth, J., Clement, T., Christopher-Hennings, J., Muscatello, D., Linhares, D.C.L. (2020) Prediction of seasonal patterns of porcine reproductive and respiratory syndrome virus RNA detection in the U.S. swine industry. *Journal of Veterinary Diagnostic Investigation*, 32(3):394-400. DOI:[10.1177/1040638720912406](https://doi.org/10.1177/1040638720912406).
178. \***Hu, D.**, O'Connor, A.M., **Wang, C.**, Sargeant, J.M., & Winder, C.B. (2020). How to Conduct a Bayesian Network Meta-Analysis. *Frontiers in Veterinary Science*, 7, 271. DOI:[10.3389/fvets.2020.00271](https://doi.org/10.3389/fvets.2020.00271).
177. \***Ji, J.**, **Wang, C.**, Rotolo, M., Zimmerman, J. (2020) Modeling the Regional Disease Spread Over Time Using a Dynamic Spatio-temporal Model with an Application in Porcine Epidemic Diarrhea Virus data collected in Iowa, U.S. *Preventive Veterinary Medicine*, 181:105053. DOI:[10.1016/j.prevetmed.2020.105053](https://doi.org/10.1016/j.prevetmed.2020.105053).
176. \***Ji, J.**, **Wang, C.**, He, Z., Hay, K., Barnes, T., O'Connor, A.M. (2020) Comparing the estimates of effect obtained from statistical causal inference methods: An example using bovine respiratory disease in feedlot cattle. *PLOS ONE*, 15(6):e0233960. DOI:[10.1371/journal.pone.0233960](https://doi.org/10.1371/journal.pone.0233960).
175. \***Hu, D.**, **Wang, C.**, O'Connor, A.M. (2020) A method of back-calculating the log odds ratio and standard error of the log odds ratio from the reported group-level risk of disease. *PLOS ONE* 15(3): e0222690. DOI:[10.1371/journal.pone.0222690](https://doi.org/10.1371/journal.pone.0222690).
174. \***Zhang, M.**, **Wang, C.**, O'Connor, A. (2020) A hierarchical Bayesian latent class mixture model with censorship for detection of linear temporal changes in antibiotic resistance. *PLOS ONE* 15(1): e0220427, *Antimicrobial Resistance Collection*. DOI:[10.1371/journal.pone.0220427](https://doi.org/10.1371/journal.pone.0220427).
173. Meier, N.F., Bai, Y., **Wang, C.**, Lee, D.C. (2020) Validation of a Multielectrode Bioelectrical Impedance Analyzer With a Dual-Energy X-Ray Absorptiometer for the Assessment of Body Composition in Older Adults. *Journal of Aging and Physical Activity*, 8:1-7. DOI:[10.1123/japa.2019-0211](https://doi.org/10.1123/japa.2019-0211).
172. Naberhaus, S.A., Krull, A.C., Arruda, B.L., Arruda, P., Sahin, O., Schwartz, K.J., Burrough, E.R., Magstadt, D.R., Matias Ferreyra, F., Gatto, I.R.H., Meiroz de Souza Almeida, H., **Wang, C.**, Kreuder, A.J.. (2020) Pathogenicity and Competitive Fitness of Salmonella enterica Serovar 4,[5],12:i:- Compared to Salmonella Typhimurium and Salmonella Derby in Swine. *Frontiers in Veterinary Science*, 6:502. DOI:[10.3389/fvets.2019.00502](https://doi.org/10.3389/fvets.2019.00502).
171. Putra, M., Sharma, S., Gage, M., Gasser, G., Hinojo-Perez, A., Olson, A., Gregory-Flores, A., Puttachary, S., **Wang, C.**, Anantharam, V., Thippeswamy, T. (2020) Inducible nitric oxide synthase inhibitor, 1400W, mitigates DFP-induced long-term neurotoxicity in the rat model. *Neurobiology of Disease*, 133:104443. DOI:[10.1016/j.nbd.2019.03.031](https://doi.org/10.1016/j.nbd.2019.03.031).
170. \***Zhao, J.**, **Wang, C.**, Totton, S.C., Cullen, J.N., O'Connor, A.M. (2019) Reporting and analysis of repeated measurements in preclinical animals experiments. *PLOS ONE*, 14(8): e0220879. DOI:[10.1371/journal.pone.0220879](https://doi.org/10.1371/journal.pone.0220879).
169. \***Hu, D.**, O'Connor, A., Winder, C., Sargeant, J., **Wang, C.** (2019). How to read and interpret the results of a Bayesian network meta-analysis: A short tutorial. *Animal Health Research Reviews*, 20(2), 106-115. DOI:[10.1017/S1466252319000343](https://doi.org/10.1017/S1466252319000343).

168. Moura, C. A., Johnson, C., Baker, S., Holtkamp, D. J., **Wang, C.**, Linhares, D. C. L. (2019). Assessment of immediate production impact following attenuated PRRS virus vaccination in breeding herds. *Porcine Health Management*, 5:13. [DOI:10.1186/s40813-019-0120-2](https://doi.org/10.1186/s40813-019-0120-2).
167. Atherly, T., Rossi, G., White, R., Seo, Y.J., **Wang, C.**, Ackermann, M., Breuer, M., Allenspach, K., Mochel, J.P., Jergens, A.E. (2019) Glucocorticoid and dietary effects on mucosal microbiota in canine inflammatory bowel disease. *PLOS ONE*; 14(12):e0226780. [DOI:10.1371/journal.pone.0226780](https://doi.org/10.1371/journal.pone.0226780).
166. O'Connor, A., \***Hu, D.**, Totton, S., Scott, N., Winder, C., Wang, B., **Wang, C.**, Glanville, J., Wood, H. White, B., Larson, R., Waldner, C., Sargeant, J. (2019). A systematic review and network meta-analysis of bacterial and viral vaccines, administered at or near arrival at the feedlot, for control of bovine respiratory disease in beef cattle. *Animal Health Research Reviews*, 20(2), 143-162. [DOI:10.1017/S1466252319000288](https://doi.org/10.1017/S1466252319000288).
165. O'Connor, A., \***Hu, D.**, Totton, S., Scott, N., Winder, C., Wang, B., **Wang, C.**, Glanville, J., Wood, H. White, B., Larson, R., Waldner, C., Sargeant, J. (2019). A systematic review and network meta-analysis of injectable antibiotic options for the control of bovine respiratory disease in the first 45 days post arrival at the feedlot. *Animal Health Research Reviews*, 20(2), 163-181. [DOI:10.1017/S1466252320000031](https://doi.org/10.1017/S1466252320000031).
164. Winder, C., Sargeant, J., \***Hu, D.**, **Wang, C.**, Kelton, D., Leblanc, S., T. F. Duffield, J. Glanville, H. Wood, K. J. Churchill, J. Dunn, M. D. Bergevin, K. Dawkins, S. Meadows, B. Deb, M. Reist, C. Moody, O'Connor, A. (2019). Comparative efficacy of teat sealants given prepartum for prevention of intramammary infections and clinical mastitis: A systematic review and network meta-analysis. *Animal Health Research Reviews*, 20(2), 182-198. [DOI:10.1017/S1466252319000276](https://doi.org/10.1017/S1466252319000276).
163. Winder, C., Sargeant, J., \***Hu, D.**, **Wang, C.**, Kelton, D., Leblanc, S., T. F. Duffield, J. Glanville, H. Wood, K. J. Churchill, J. Dunn, M. D. Bergevin, K. Dawkins, S. Meadows, B. Deb, M. Reist, C. Moody, O'Connor, A. (2019). Comparative efficacy of antimicrobial treatments in dairy cows at dry-off to prevent new intramammary infections during the dry period or clinical mastitis during early lactation: A systematic review and network meta-analysis. *Animal Health Research Reviews*, 20(2), 199-216. [DOI:10.1017/S1466252319000239](https://doi.org/10.1017/S1466252319000239).
162. Winder, C., Sargeant, J., \***Hu, D.**, **Wang, C.**, Kelton, D., Godkin, M., Churchill, K. J., O'Connor, A. (2019). Comparative efficacy of antimicrobials for treatment of clinical mastitis in lactating dairy cattle: A systematic review and network meta-analysis. *Animal Health Research Reviews*, 20(2), 229-246. [DOI:10.1017/S1466252319000318](https://doi.org/10.1017/S1466252319000318).
161. Sargeant, J., Bergevin, M.D., Churchill, K., Dawkins, K., Deb, B., Dunn, J., \***Hu, D.**, Logue, C.M., Meadows, S., Moody, C., Novy, A., O'Connor, A.M., Reist, M., Sato, Y., **Wang, C.**, Winder, C.B. (2019). The efficacy of litter management strategies to prevent morbidity and mortality in broiler chickens: A systematic review and network meta-analysis. *Animal Health Research Reviews*, 20(2), 247-262. [DOI:10.1017/S1466252319000227](https://doi.org/10.1017/S1466252319000227).
160. Sargeant, J., Deb, B., Bergevin, M.D., Churchill, K., Dawkins, K., Dunn, J., \***Hu, D.**, Moody, C., O'Connor, A.M., O'Sullivan, T.L., Reist, M., **Wang, C.**, Wilhelm, B., Winder, C.B. (2019). Efficacy of bacterial vaccines to prevent respiratory disease in swine: A systematic review and network meta-analysis. *Animal Health Research Reviews*, 20(2), 274-290. [DOI:10.1017/S1466252319000173](https://doi.org/10.1017/S1466252319000173).

159. Sargeant, J., Bergevin, M.D., Churchill, K., Dawkins, K., Deb, B., Dunn, J., \***Hu, D.**, Moody, C., O'Connor, A.M., O'Sullivan, T.L., Reist, M., **Wang, C.**, Wilhelm, B., Winder, C.B. (2019). A systematic review of the efficacy of antibiotics for the prevention of swine respiratory disease. *Animal Health Research Reviews*, 20(2), 291-304. [DOI:10.1017/S1466252319000185](https://doi.org/10.1017/S1466252319000185).
158. Bries, A.E., **Wang, C.**, Agbemaflle, I. Wels, B, Reddy, M.B. (2019) Assessment of Acute Serum, Non-Transferrin Bound Iron and Gastrointestinal Symptoms with 3-Week Consumption with Iron-Enriched *Aspergillus Oryzae* Compared to Ferrous Sulfate, *Current Developments in Nutrition*, 3(12):nzz127. [DOI:10.1093/cdn/nzz127](https://doi.org/10.1093/cdn/nzz127).
157. Zhang, Y., O'Connor, A.M., **Wang, C.**, Dickson, J.S., Hurd, H.S., Wang, B. (2019) Interventions Targeting Deep Tissue Lymph Nodes May Not Effectively Reduce the Risk of Salmonellosis from Ground Pork Consumption: A Quantitative Microbial Risk Assessment. *Risk Analysis*, 39(10):2237-2258. [DOI:10.1111/risa.13317](https://doi.org/10.1111/risa.13317).
156. Fan, J., Gerber, P.F., Cubas Atienzar, A., Eppink, L., **Wang, C.**, Opriessnig, T. (2019) Porcine reproductive and respiratory syndrome virus RNA detection in different matrices under typical storage conditions in the UK. *Veterinary Record*, 185(1):21. [DOI:10.1136/vr.105312](https://doi.org/10.1136/vr.105312).
155. Mehling, S., Henao-Diaz, A., Maurer, J., Kluber, E., Stika, R., Rademacher, C., Zimmerman, J., Giménez-Lirola, L., **Wang, C.**, Holtkamp, D. J., Main, R., Karriker, L., Linhares, D., Breuer, M., Goodell, C., & Baum, D. (2019). Mortality Patterns in a Commercial Wean-To Finish Swine Production System. *Veterinary sciences*, 6(2), 49. [DOI:10.3390/vetsci6020049](https://doi.org/10.3390/vetsci6020049).
154. \***Sun, Y.**, **Wang, C.**, Meeker, W.Q., Morris, M., Zimmerman, J. (2019). A Latent Spatial Piecewise Exponential Model for Interval-Censored Disease Surveillance Data with Time-Varying Covariates and Misclassification. *Statistics and Its Interface*, 12(1):11-19. [DOI:10.4310/SII.2019.v12.n1.a2](https://doi.org/10.4310/SII.2019.v12.n1.a2).
153. Allenspach, K.A., Mochel, J.P., \***Du, Y.**, Priestnall, S.L., Moore, F., Slayter, M., Rodrigues, A., Ackermann, M., Krockenberger, M., Mansell, J.; WSAVA GI Standardization Working Group, Luckschander, N., **Wang, C.**, Suchodolski, J., Berghoff, N., Jergens, A.E. (2019) Correlating Gastrointestinal Histopathologic Changes to Clinical Disease Activity in Dogs With Idiopathic Inflammatory Bowel Disease. *Veterinary Pathology*, 56(3):435-443. [DOI:10.1177/0300985818813090](https://doi.org/10.1177/0300985818813090).
152. Poonsuk, K., Giménez-Lirola, L.G., Magtoto, R.L., \***Ji, J.**, Baum, D.H., Rademacher, C.J., Brown, J.T., Zhang, J., **Wang, C.**, Main, R.G., Zimmerman, J.J. (2018) The effect of chemical clarification of oral fluids on porcine epidemic diarrhea virus antibody responses. *Journal of Veterinary Diagnostic Investigation*, 30(6):937-941. [DOI:10.1177/1040638718798672](https://doi.org/10.1177/1040638718798672).
151. Weiser, A.C., Poonsuk, K., Bade, S.A., Gauger, P.C., Rotolo, M., Harmon, K., Gonzalez, W.M., **Wang, C.**, Main, R., Zimmerman, J.J. (2018) Effects of sample handling on the detection of porcine reproductive and respiratory syndrome virus in oral fluids by reverse-transcription real-time PCR. *Journal of Veterinary Diagnostic Investigation*, 30(6):807-812. [DOI:10.1177/1040638718805534](https://doi.org/10.1177/1040638718805534).
150. Almeida, M.N., Zimmerman, J.J., **Wang, C.**, Linhares, D.C.L. (2018) Assessment of abattoir based monitoring of PRRSV using oral fluids. *Preventive Veterinary Medicine*, 158:137-145. [DOI:10.1016/j.prevetmed.2018.08.002](https://doi.org/10.1016/j.prevetmed.2018.08.002).
149. Garraway, K., Johannes, C.M., Bryan, A., Peauroi, J., Rossi, G., \***Zhang, M.**, **Wang, C.**, Allenspach, K., Jergens, A.E. (2018) Relationship of the mucosal microbiota to gastrointestinal inflammation and small cell intestinal lymphoma in cats. *Journal of Veterinary Internal Medicine*, 32(5):1692-1702. [DOI:10.1111/jvim.15291](https://doi.org/10.1111/jvim.15291).

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139. Baker, K.L., Mowrer, C.L., Zhang, J., Chen, Q., Ramirez, A., **Wang, C.**, Karriker, L.A., Holtkamp, D.J. (2018) Evaluation of a peroxygen-based disinfectant for inactivation of porcine epidemic diarrhea virus at low temperatures on metal surfaces. *Veterinary Microbiology*, 214:99-107. [DOI:10.1016/j.vetmic.2017.12.019](https://doi.org/10.1016/j.vetmic.2017.12.019).
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#### Promotion to Associate Professor

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2. **Wang, C.**, Turnbull, B. W., Gröhn, Y. T., Nielsen, S. S. (2007). Nonparametric estimation of ROC curves based on Bayesian models when the true disease state is unknown. *Journal of Agricultural, Biological, and Environmental Statistics*, 12:128–146. DOI:10.1198/108571107X178095
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## MANUSCRIPTS SUBMITTED TO PEER-REVIEWED JOURNALS

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1. \***Zhang, M., Wang, C.**, O'Connor, A.. (2021) A Bayesian Latent Class Mixture Model With Censoring for Correlation Analysis in Antimicrobial Resistance Across Populations. *BMC Medical Research Methodology*. DOI: 10.21203/rs.3.rs-94417/v1. Invited revision.
2. \***Hu, D., Wang, C.**, O'Connor, A. (2021) A Likelihood Ratio Test For The Homogeneity of Between-Study Variance in Network Meta-Analysis. *Systematic Reviews*. Submitted. DOI: 10.21203/rs.3.rs-224184/v1.
3. \***Zhang, M., Wang, C.**, O'Connor, A.. (2021) A Bayesian approach to modeling antimicrobial multidrug resistance. *PLOS ONE*. Submitted.
4. Magalhães, E.S., Zimmerman, J.J., Thomas, P., Moura, C.A.A., Trevisan, G., Holtkamp, D.J., **Wang, C.**, Rademacher, C., Silva, G.S., Linhares, D.C.L. (2021) Whole-herd drivers of wean-to-finish mortality under the conditions of a Midwestern USA swine production system. *Preventive Veterinary Medicine*. Submitted.

5. Bhat, S.M., Massey, N., Shrestha, D., Karriker, L.A., Jelesijević, T., **Wang, C.**, Charavaryamath, C. (2021) Transcriptomic and Ultrastructural Evidence Indicate That Anti-HMGB1 Antibodies Rescue Organic Dust Induced Mitochondrial Dysfunction. *Cell and Tissue Research*. Submitted.

## MANUSCRIPTS IN PREPERATION

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1. **\*Hu, D., Wang, C.**, O'Connor, A. (2021) Using information from network meta-analyses to optimize the power and sample allocation of a subsequent trial with a new treatment. In preparation.
2. **\*Du, Y., Wang, C.**, Zimmerman, J.J. (2021) Choosing cutoff values for correlated continuous diagnostic data: adjustment for confidence interval estimations of sensitivity and specificity.
3. **\*Ye, F., Wang, C.**, O'Connor, A. (2021) Using information from existing network meta-analyses to optimize a new two-arm trial. In preparation.
4. **\*Hu, D., Wang, C.**, O'Connor, A. (2021) Optimizing treatment allocation of a group-randomized trial with a new treatment using existing network meta-analyses. In preparation.
5. Mugabi, R., Silva, A.P., Rotolo, M.L., Krantz, S., Harms, P. McKeen, L., **\*Hu, D., Wang, C.**, Zimmerman, J.J., Clavijo, M.J. (2021) Evaluation of the effect of tracheal sample pooling on M. hyopneumoniae PCR detection. In preparation
6. Trevisan, G., **\*Morris, P.**, Culhane, M., Malladi, S., **Wang, C.**, Zimmerman, J.J. (2021) Participatoryactive Surveillance For The Detectionof A Transboundary Swine Pathogen- Exploration Of The Concept. In preparation
7. Massey, N., Shrestha, D., Bhat, S., Padhi, P., **Wang, C.**, Karriker, L.A., Smith, J.L., Kanthasamy, A.G., Charavaryamath, C. (2021) Mitoapocynin Attenuates Organic Dust Exposure Induced Neuroinflammation and Sensory-motor Deficits in a Mouse Model: Relevance to the Role of Lung-Brain Axis in Pathogenesis of Chronic Neurological Diseases During Environmental Dust Exposure. *Frontiers in Cellular Neuroscience*. To be submitted.

## PUBLISHED BOOK CHAPTERS

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1. Liu, P., **\*Goren, E., \*Morris, P.**, Walker, D., **Wang, C.** (2021) Statistical Methods for Feature Identification in Microbiome Studies. in *Statistical Analysis of Microbiome Data (Frontiers in Probability and the Statistical Sciences)*, ed. Somnath Datta, Subharup Guha.

## BOOK CHAPTERS IN PREPERATION

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1. Zimmerman, J., Gimenez-Lirola, L., **Wang, C.** (2021) Advanced techniques to monitor pig health and identify disease. in *Optimising pig herd health and production*, ed. Dominiek Maes, Joaquim Segalés.

## RESEARCH GRANTS AND PROPOSALS

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Awarded:

- ◆ USDA (Grant No: 2018-67030-28361) 07/01/18-10/31/21  
 Chong Wang (PI), Annette O'Connor  
 Solving the inadequacies of current approaches to analysis of antibiotic resistance data.  
 Total Award Amount: \$100,000  
 Role: Principle Investigator. Development of novel statistical methodologies for antibiotic resistance data, data analyses, computationally intensive simulations, advising research assistant students, and dissemination of findings.
- ◆ Swine Health Information Center (#20-127) 08/16/20-08/15/21  
 Chong Wang (PI), Jeffrey Zimmerman  
 Development of Spatially Balanced Sampling Draft Program for Disease Surveillance  
 Total Award Amount: \$25,000  
 Role: Principle Investigator. Development of novel statistical methodologies for animal disease surveillance, data analyses, computationally intensive simulations, advising research assistant students, and dissemination of findings.
- ◆ FDA (Grant ID: U01 FD007049-01). 09/01/20-08/31/21  
 Paul Morley (PI), Bryant T, O'Connor A, Wang C, Nair M, Morgan B, Szasz J, Lawrence T, Richeson T, Lucherker L, Weinheimer B  
 Evaluating duration of tylosin phosphate treatment in feedlot cattle for liver abscess prevention to ensure efficacy while addressing concerns about antimicrobial resistance  
 Total Award Amount: \$499,943  
 Role: Co-PI. Development of novel statistical methodologies to design a new clinical trial with existing network meta analyses (NMA) data, NMA data analyses, computationally intensive simulations, advising research assistant students, and dissemination of findings.
- ◆ Michigan State University (#581465) 07/01/21-12/31/22  
 Chong Wang (PI)  
 Understanding the design of randomized controlled designs in livestock production  
 Total Award Amount: \$31,350  
 Role: Principle Investigator. Development of novel statistical methodologies to design randomized controlled trials with existing network meta analyses (NMA) data, NMA data analyses, computationally intensive simulations, advising research assistant students, and dissemination of findings.
- ◆ NIH-NINDS (Grant No: U01 NS117284-01A1) 07/01/21-06/30/26  
 Thimmasettappa Thippeswamy (PI), Chong Wang  
 Saracatinib and 1400W Counteract Nerve Agents-induced Long-term Neurotoxicity  
 Total Award Amount: \$ 3,748,154  
 Role: Co-PI. Design of experiments, sample size and power calculation, data analyses, and dissemination of findings

- ◆ NIH-NINDS (Grant No: 022970/147405) 07/01/20-06/30/23  
Anumantha Kanthasamy (PI), Arthi Kanthasamy, Chong Wang, Gregory Phillips, Jonathan Mochel, Shankumar Mooyottu  
Novel Re-engineered L-DOPA probiotic therapy for Parkinson's Disease  
Total Award Amount: \$ 1,177,494  
Role: Co-PI. Design of experiments, sample size and power calculation, data analyses, and dissemination of findings.
- ◆ USDA-NIFA-AFRI 09/01/21-08/31/25  
Nick Serao (PI)  
TTAGGD: Transdisciplinary Training in Animal Genetics and Genomics, and Disease  
Total Award Amount: \$262,500  
Role: Collaborator. Advising and training of graduate students.
- ◆ National Pork Board (#19-067) 09/01/19-08/31/20  
Jeff Zimmerman(PI), Luis Gimenez-Lirola, Locke Karriker, Rodger Main, Chong Wang, Justin T Brown  
Oral fluid sample size for FAD detection at low prevalence in large commercial pigs  
Total Award Amount: \$ 141,536  
Role: Co-PI. Design of experiments, sample size and power calculation, data analyses, and dissemination of findings.
- ◆ Swine Health Information Center 01/01/19-12/01/20  
Luis Gimenez-Lirola (PI), Phillip Gauger, Rodger Main, Chong Wang, Jeffrey Zimmerman  
Detection of PRV Shedding by PCR: Nasal Swab vs Oral Fluid Samples  
Total Award Amount: \$102,174  
Role: Co-PI. Design of experiments, sample size and power calculation, data analyses, and dissemination of findings.
- ◆ Central Plains Federal Statistical Research Data Center (CPRDC) 10/01/18-9/30/19  
Chong Wang (PI), Zhengyuan Zhu, Duck-chul Lee, Peng Liu, Zhulin He  
Statistical Causal Inference Analyses of the Effect of Physical Activity on Cardiovascular Disease and Diabetes  
Total Award Amount: \$ 10,000  
Role: Principle Investigator. Novel application of statistical causal inference methodologies to kinesiology data, data collection and analyses, computationally intensive simulations, advising research assistant students, and dissemination of findings.
- ◆ Swine Health Information Center 09/01/18-08/31/19  
Jeff Zimmerman (PI), Luis Gimenez-Lirola, Roger Main, Chong Wang, Korakrit Poonsuk  
Validation of a FMDV 3ABC indirect ELISA (iELISA) for swine oral fluid specimens  
Total Award Amount: \$112,001  
Role: Co-PI. Design of experiments, sample size and power calculation, data analyses, and dissemination of findings.

- ◆ Swine Health Information Center (#18-198) 10/01/18-9/30/19  
Jeff Zimmerman(PI), Chong Wang, Rodger Main  
Development of Regional Surveillance Systems for Emerging and FADs of Swine  
Total Award Amount: \$24,702  
Role: Principle Investigator. Novel application of spatially balanced sampling methodologies to regional surveillance of swine disease, data collection and analyses, computationally intensive simulations, advising research assistant students, and dissemination of findings.
- ◆ National Pork Board Checkoff research funds (#17-174) 10/01/17-9/30/18  
Chong Wang (PI), Jeffrey Zimmerman  
What is the best oral fluid sampling strategy for PRRSV detection? A spatiotemporal approach.  
Total Award Amount: \$ 26,062  
Role: Principle Investigator. Development of novel statistical methodologies for sampling animal diseases, data collection and analyses, computationally intensive simulations, advising research assistant students, and dissemination of findings.
- ◆ Swine Health Information Center 10/01/17-9/30/18  
Luis G Gimenez-Lirola (PI), Jeffrey Zimmerman, David Baum, Pablo Pineyro, Rodger Main, Chong Wang  
Development of PRV oral fluid/fecal antibody ELISAs (screening and DIVA)  
Total Award Amount: \$ 72,437  
Role: Co-PI. Design of experiments, sample size and power calculation, data analyses, and dissemination of findings.

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**Promotion to Associate Professor**

- ◆ National Pork Board Checkoff research funds 10/01/11-9/30/13  
Chong Wang (PI), Jeffrey Zimmerman, Jae-Kwang Kim, Alejandro Ramirez, Derald Holtkamp  
Design and analysis of PRRSV surveillance: temporal and spatial sampling, mapping, monitoring and automated rapid detection of outbreak  
Role: Principle Investigator  
Total Award Amount: \$ 24,378
- ◆ FDA 9/1/2013-8/31/2018  
Wilson Rumbelha (PI), Steve Ensley, Paula Imerman, Chong Wang  
ISU Vet-LIRN collaborative validation of testing methods on animal diagnostic specimens  
Role: Co-PI  
Total Award Amount: \$ 495,000
- ◆ USDA-NIFA-AFRI 03/01/12-12/31/14  
Jeffrey Zimmerman (PI)  
Safeguarding the viability of US swine producers through a comprehensive and integrated swine health surveillance system. Part 1. Optimization of diagnostic assays for oral fluid specimens  
Role: Co-PI  
Total Award Amount: \$ 250,000

- ◆ NIH U19 AI-091031 07/01/10-6/30/15  
Michael W. Cho (PI)  
Enhancing B cell immunity against HIV-1 using novel vaccine delivery platforms  
Role: Statistician  
Total Award Amount: \$ 6,859,390
  
- ◆ National Pork Board Checkoff research funds 01/01/14-06/30/14  
Luis Gabriel Gimenez-Lirola (PI), Kyoung-Jin Yoon, John K Johnson, Darin Michael Madson,  
Rodger Gary Main, Chong Wang, Jianqiang Zhang, Jeffrey J Zimmerman  
Defining PEDV maternal humoral immunity and correlates of neonatal protection  
Role: Co-PI  
Total Award Amount: \$ 107,711
  
- ◆ National Pork Board Checkoff research funds 12/01/13-11/30/15  
Jeffrey Zimmerman (PI), Kyoung-Jin Yoon, Chong Wang  
Development of on-farm PRRSV surveillance guidelines for the modern pork industry  
Role: Co-PI  
Total Award Amount: \$ 199,918
  
- ◆ Innovative Swine Industry Enhancement Grant Program (ISIEGP), Iowa Attorney General's  
Office in collaboration with Smithfield Foods Inc. 09/01/13-08/31/14  
Jeffrey Zimmerman (PI), Chong Wang, Kyoung-Jin Yoon  
Developing sample size and frequency guidelines for PRRSV surveillance using pen-based  
oral fluid samples  
Role: Co-PI  
Total Award Amount: \$ 71,027
  
- ◆ Innovative Swine Industry Enhancement Grant Program, Iowa Attorney General's Office  
Jeffrey Zimmerman (PI) 05/16/11-05/15/12  
Sample size recommendations for the detection of porcine reproductive and respiratory  
syndrome virus (PRRSV) infection using pen-based oral fluid samples.  
Role: Co-PI  
Total Award Amount: \$ 50,538
  
- ◆ Zurex Pharma, Inc. (2013) 01/01/13-12/31/14  
Jennifer Schleining (PI), Paul Plummer, Chong Wang  
Antimicrobial Efficacy of a Solution Containing Sodium Citrate and Isopropyl Alcohol as a  
Preoperative Preparation in Cattle Under Field Conditions.  
Role: Co-PI  
Total Award Amount: \$ 36,000
  
- ◆ American Kennel Club 01/15/12-01/15/14  
Albert E Jergens (PI)  
Probiotic VSL# 3 reduces enteritis in dogs with inflammatory bowel disease  
Role: Statistician  
Total Award Amount: \$ 97,416



- ◆ ISU Presidential Initiative for Interdisciplinary Research (PIIR) 07/01/13-06/30/16  
Balaji Narasimhan (PI), Michael Wannemuehler, Susan Carpenter  
Systems Design of Nanovaccines  
Role: Co-PI  
Total Award Amount: \$ 1,500,000
  
- ◆ ISU Presidential Initiative for Interdisciplinary Research (PIIR) 07/01/13-06/30/16  
Michael Cho (PI), Jim Roth, Kyoungjin Yoon  
Integrated, interdisciplinary vaccine research against antigenically diverse viruses  
Role: Co-PI  
Total Award Amount: \$ 1,245,000
  
- ◆ ISU Women’s and Diversity Grants Program 07/01/14-06/30/15  
Wilson Rumbelha (PI), Catherine Logue, Chong Wang  
College of Veterinary Medicine diversity climate survey  
Role: Co – Principal Investigator  
Total Award Amount: \$ 5,000
  
- ◆ ISU VCS Competitive Grants David Wong (PI) 01/01/11-12/31/11  
Use of Intravenous Polymyxin B to Ameliorate Endotoxemia in Neonatal Foals  
Role: Statistician  
Total Award Amount: \$ 5,320
  
- ◆ ISU VCS Competitive Grants Bruce W Christensen(PI) 01/01/11-12/31/11  
Somali wild ass (*Equus africanus somaliensis*) chilled semen transport for frozen  
cryopreservation  
Role: Co-Investigator  
Total Award Amount: \$ 4,900
  
- ◆ Iowa State University CVM Health Livestock Initiative (HLI) 701-05-04-00-0036  
Patrick J. Gorden (PI) 07/01/09-06/30/11  
Development of a Metagenomics Tool Box and Application of Metagenomics to Address  
culture Negative Clinical Mastitis Samples  
Role: Co-Investigator  
Total Award Amount: \$ 30,000

Proposals Pending:

- ◆ USDA-APHIS 01/01/22-12/31/23  
Jeff Zimmerman (PI), Chong Wang, Gustavo, De-Sousa-E-Silva  
Participatory Regional Surveillance to track regional FAD status and improve swine movement  
decisions  
Role: Co-PI  
Total Award Amount: \$ 216,740
  
- ◆ Burroughs Wellcome Funds (IRSA) 09/01/21-08/31/26  
Annette O’Connor (PI), Chong Wang  
Leveraging research synthesis tools to enable regulator decision making  
Role: Co-PI  
Total Award Amount: \$ 164,067

- ◆ NIH-NIA 09/01/21-08/31/26  
Anumantha Kanthasamy (PI), Arthi Kanthasamy, Vellareddy Anantharam, Gregory Phillips, Karin, Allenspach-Jorn, Jonathan Mochel, Agnes Bourgois-Mochel, Chong Wang, Shankumar Mooyottu  
Novel re-engineered microbiome-based biologic therapy to treat cognitive and behavioral symptoms of Alzheimer's disease and related dementias  
Role: Co-PI  
Total Award Amount: \$ 7,513,489
- ◆ USDA-NIFA 05/01/22-04/30/25  
Jianqiang Zhang (PI), Derald Holtkamp, Chong Wang, Michael Rahe, Jeffery Zimmerman, Crystal Loving  
Informing vaccine selection: immunogenicity and protective efficacy of PRRSV vaccines  
Role: Co-PI  
Total Award Amount: \$ 647,892

Proposals Not Funded:

- ◆ NIH 07/01/20-06/30/22  
Wilson Rumbelha (PI), Jodi D Smith, Chong Wang  
Mechanisms of dual Midazolam-Cobinamide therapy for acute hydrogen sulfide-induced morbidity and mortality  
Role: Co-Investigator  
Total Award Amount: \$ 406,849
- ◆ NIH 09/01/19-08/30/24  
Kanthasamy, Anumantha G (PI), Arthi Kanthasamy, Wang, Chong, Auriel A Willette  
Evaluation of Rationale Based Progression Biomarkers for Parkinson's Disease Dementia  
Role: Co-Investigator  
Total Award Amount: \$ 3,828,906
- ◆ DOD 9/1/2019-2/28/2021  
Kanthasamy, Anumantha G (PI), Mochel, Jonathan P, Phillips, Gregory J, Wang, Chong, Kanthasamy, Arthi  
Reengineered L-DOPA Microbiome Therapy for Depression  
Role: Co-Investigator  
Total Award Amount: \$ 534,859
- ◆ NIH 07/01/19-06/30/24  
Thippeswamy, Thimmasettapp (PI), Wang, Chong  
Saracatinib and 1400W counteract Nerve Agent-induced Long-term Neurotoxicity  
Role: Co-Investigator  
Total Award Amount: \$ 3,172,655
- ◆ NIH 04/01/19-03/31/24  
Wilson Rumbelha (PI), Arthi Kanthasamy, Smith, Jodi D, Chong Wang  
Deciphering mechanisms of acute hydrogen sulfide-induced neurotoxicity  
Role: Co-Investigator  
Total Award Amount: \$ 1,851,362

- ◆ NIH 07/01/17-06/30/22  
Wilson Rumbelha (PI), Arthi Kanthasamy, Anumantha G Kanthasamy, Chong Wang, Paula M Imerman  
Optimizing cobinamide-midazolam combination therapy for treatment of hydrogen sulfide induced neurotoxicity and neurodegeneration  
Role: Co-Investigator  
Total Award Amount: \$ 3,409,732
- ◆ NIH 03/01/17-2/28/22  
Michael Cho (PI), David Verhoeven, Chong Wang, Young-Jin Lee, Chenxu Yu  
Eliciting protective antibody responses against HIV-1 gp41 MPER  
Role: Co-Investigator  
Total Award Amount: \$ 10,529,573
- ◆ FOUNDATION FOR MEAT AND POULTRY 02/01/17-01/31/18  
Annette M O'Connor (PI), Chong Wang, Catherine Logue, James S Dickson  
Assessing the impact of pathogen reduction treatments in plant on Salmonella serotype I 4,[5], 12:i:-  
Role: Co-Investigator  
Total Award Amount: \$ 136,809
- ◆ NATIONAL PORK BOARD 05/01/17-04/30/18  
Chong Wang (PI), Annette M O'Connor  
Assessing association in antimicrobial resistance between swine and human: A Bayesian latent class hierarchical model with arbitrary censoring  
Role: Principle-Investigator  
Total Award Amount: \$ 21,557
- ◆ Boehringer Ingelheim Vetmedica, Inc. 05/16/17-05/15/18  
Chong Wang (PI), Jeff Zimmerman  
What is the best oral fluid sampling strategy for PRRSV detection? An analysis of spatiotemporal field data  
Role: Principle-Investigator  
Total Award Amount: \$ 34,714
- ◆ AMERICAN ASSOCIATION OF SWINE VETERINARIANS 06/01/17-05/31/18  
Jianqiang Zhang (PI), Phillip Gauger, Karen M Harmon, Rodger Gary Main, Chong Wang  
Comparison of PRRSV virus isolation in different cell lines towards improving success of isolating PRRSV from clinical samples  
Role: Co-Investigator  
Total Award Amount: \$ 30,000
- ◆ SWINE HEALTH INFORMATION CENTER 09/01/17-08/31/18  
Jeff Zimmerman (PI), Chong Wang, Rodger Gary Main  
An exploration of surveillance based on spatial sampling using ISU VDL submission.  
Role: Principle-Investigator  
Total Award Amount: \$ 69,792

- ◆ USDA-NIFA-AFRI 01/01/15-12/31/19  
James Roth (PI), Rodger Main, Jeffrey Zimmerman, Max Morris, Chong Wang  
Implementation of the Secure Pork Supply Business Continuity Plan to Improve  
Prevention, Early Detection, Rapid Diagnosis, Containment, Mitigation and Recovery  
from Four Foreign Animal Diseases  
Role: Co-Investigator  
Total Award Amount: \$ 7,476,936.00
  
- ◆ Iowa Pork Producers Association 01/01/13-12/31/13  
Phil Gauger (PI)  
Detection and characterization of Influenza A virus endemic circulation in neonatal nursery  
pigs in a farm using routine influenza vaccination  
Role: Co-Investigator  
Total Award Amount: \$ 70,000
  
- ◆ USDA Johann Coetzee (PI) 12/01/12-11/30/16  
Pain mitigation in organic livestock production: identifying needs and evaluating interventions  
that assist producers in enhancing animal welfare  
Role: Co-Investigator  
Total Award Amount: \$ 1,270,475
  
- ◆ Morris Animal Foundation (MAF) Grant Annette M O'Connor (PI) 07/01/12-06/30/13  
A systematic review and meta-analysis of the comparative efficacy of  
interventions for the reduction of fleas populations in dogs  
Role: Co-Investigator  
Total Award Amount: \$ 36,765
  
- ◆ National Science Foundation Robert W Thornburg (PI) 10/01/12-09/30/15  
GEPR: Genomics and biochemistry of plant secretions among the core eudicots  
Role: Co- Principal Investigator  
Total Award Amount: \$ 2,457,192
  
- ◆ Boehringer Ingelheim Vetmedica Inc. Grant Tanja Opriessnig (PI) 03/16/11-03/15/12  
Best Practices For Minimizing False Positive PRRSV Serology Test Results  
Role: Co- Investigator  
Total Award Amount: \$ 25,000
  
- ◆ NSF IOS Plant Genome Research Project 07/01/11-06/30/15  
Robert W Thornburg (PI)  
Genomics and biochemistry of plant secretions among the core eudicots  
Role: Co- Principal Investigator  
Total Award Amount: \$ 3,823,222
  
- ◆ NSF IOS Organismal environ interactions 07/01/11-06/30/14  
Robert W Thornburg (PI)  
Functional Characterization of swarms of plant peptides and the proteases that spawn them  
Role: Co- Principal Investigator  
Total Award Amount: \$ 1,545,303

- ◆ ISU CVM Seed Grants Program 07/01/11-06/30/12  
Chong Wang (PI)  
Sequential Design and Analysis of Animal Infectious Disease Surveillance  
Role: Principle Investigator  
Total Award Amount: \$ 20,000
  
- ◆ Morris Animal Foundation (MAF) Grant Bruce W Christensen(PI) 01/01/11-12/31/12  
Somali wild ass (*Equus africanus somaliensis*) chilled semen transport for cryopreservation  
Role: Co-Investigator  
Total Award Amount: \$ 96,331
  
- ◆ DOD 07/01/11-06/30/14  
Albert Jergens (PI)  
Rules of Engagement: Bacterial Mucosal Association Promotes Inflammation and Risk of IBD  
Role: Co-Investigator  
Total Award Amount: \$ 1,025,394
  
- ◆ NIH R01 Albert Jergens (PI)  
Imbalances in gut microbiota define onset and severity of colitis  
Role: Co-Investigator  
Total Award Amount: \$ 2,548,516
- ◆ PFIZER ANIMAL HEALTH Annette O'Connor (PI)  
An equivalence study for two commercially available PCVII vaccines  
Role: Co-Investigator  
Total Award Amount: \$ 109,754
  
- ◆ USDA AFRI 1/1/11-12/31/16  
Nancy Cornick (PI)  
Addressing mechanisms of *Mycoplasma hyopneumoniae* pathogenesis through functional genomics  
Role: Co-Investigator  
Total Award Amount: \$ 2,478,227
  
- ◆ USDA AFRI 06/01/11-05/31/14  
Jeffrey Zimmerman (PI)  
New Biology for the 21st Century: Defining New Standards of Animal Welfare and Health in Commercial Swine Populations  
Role: Co-Investigator  
Total Award Amount: \$ 699,517
  
- ◆ USDA AFRI Chris Minion (PI)  
Addressing mechanisms of *Mycoplasma hyopneumoniae* pathogenesis through functional genomics  
Role: Co-Investigator  
Total Award Amount: \$ 817,156
  
- ◆ NIH R15 Tim Frana (PI)  
Methicillin-resistant staphylococci found in students visiting animal facilities  
Role: Statistician

- ◆ Boehringer Ingelheim Vetmedica Inc. Bovine Infectious Disease Research Initiative Program  
Annette O'Connor (PI)  
Understanding the Role of *Moraxella bovoculi* in the Epidemiology of Infectious Bovine Keratoconjunctivitis (IBK)  
Role: Co-Investigator

## INVITED PRESENTATIONS

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- ◆ Active regional surveillance for early detection of exotic/emerging pathogens of swine: A comparison of statistical methods for farm selection. The 3rd Annual Veterinary Diagnostics Conference. Zhejiang, China, June, 2021.
- ◆ Application of spatially balanced sampling to active regional surveillance of U.S. commercial swine Farms. The 3rd Annual Veterinary Diagnostics Conference. Zhejiang, China, June, 2021.
- ◆ Set testing methods based on zero-inflated models for microbiome data. 13th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics 2020).
- ◆ Network Meta-analysis for Veterinarians, Department of Population Medicine, Ontario Veterinary College, University of Guelph, Guelph, Ontario, Canada, December, 2019
- ◆ Modeling Regional PEDV Spread Among Swine Farms in Iowa Using a Bayesian Spatio-temporal Model with Missing Data. USDA, Fort Collins, August, 2019
- ◆ Spatio-temporal approaches to surveillance sampling for disease detection. 99th Annual Conference of Research Workers in Animal Diseases. Chicago, Illinois. Dec. 2018.  
**Keynote Speech.**
- ◆ Sample Size and Allocation for Animal Disease Surveillance, 2015 ICSA CHINA STATISTICS CONFERENCE, Shanghai, China, July, 2015
- ◆ A Semi-parametric Bayesian Approach for Differential Gene Expression Analysis with RNA-seq Data, Computational and Applied Math Seminar, Department of Mathematics, Iowa State University, Ames, IA, Sep, 2014
- ◆ Zero-Inflated Poisson Model for Insertion Tolerance Analysis of Genes Based on Tn-seq Data. Symposium: Innovations in Design, Analysis, and Dissemination: Frontiers in Biostatistical Methods. Overland Park, Kansas, April, 2014.
- ◆ Surveillance samples: Where? How many? How often? AASV 2013 Annual Meeting, San Diego, CA, USA, March, 2013
- ◆ Design of repeated sampling for disease detection in surveillance of PRRSv, 2013 ICSA/ISBS Joint Statistics Conference, Bethesda, MD, USA, June, 2013
- ◆ Bayesian Analysis of Longitudinal Disease Diagnostic Data without a Perfect Reference Test, Animal Breeding and Genetics Seminar Series, Iowa State University, Ames, IA, March, 2012
- ◆ Design and analysis of PRRSv surveillance in swine, ICSA 2012 Applied Statistics Symposium, Boston, MA, July 26, 2012

- ◆ Method of Moments Estimation for the Proportion of the True Null Hypotheses in Multiple Testing. Iowa State University 2009 Conference in Statistics. Ames, IA. June 2009.
- ◆ ROC Analysis for Longitudinal Disease Diagnostic Data Without a Gold Standard Test  
University of Kentucky, KY, 2007  
University of Pittsburgh, PA, 2007  
University of Arizona, AZ, 2007  
University of Missouri at Kansas City, MO, 2007  
New Jersey Institute of Technology, NJ, 2007  
California State University, Long Beach, CA, 2007  
Georgia Southern University, GA, 2007
- ◆ Estimation of ROC Curves when There Is No Perfect Reference Test  
Brown University, RI, 2006  
University of Missouri at Columbia, MO, 2006

### **OTHER PRESENTATIONS/ABSTRACTS/PROCEEDINGS**

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124. **Wang, C., \*Zhang, M.,** O'Connor A. A Bayesian latent class mixture model for correlation analysis in antimicrobial resistance across populations, NIAMRRE (National Institute of Antimicrobial Resistance Research and Education) Annual Conference, 2021.
123. **\*Goren, E., Wang, C.,** Liu, P., Feature Selection for Microbiome Studies in the Presence of Confounding Using Standardization. Joint Statistical Meetings, 2021. Abstract #316635.
122. **\*Hu, D.,** Cheng, T.-Y., **\*Morris, P.,** Zimmerman, J., **Wang, C.** October 2020. Active regional surveillance for early detection of exotic/emerging pathogens of swine: A comparison of statistical methods for farm selection. American Association of Veterinary Laboratory Diagnosticians 2020 annual meeting. **Trainee Travel Awards**
121. **\*Zhang, M., Wang, C.,** O'Connor A., Bayesian latent class mixture model with censoring for correlation in antimicrobial resistance across populations. Conference of Research Workers in Animal Diseases (CRWAD), 2020. **Best Student Paper Award.**
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**Promotion to Associate Professor**

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29. Kittawornrat A, Prickett J, Johnson J, Whitney D, Olsen C, Schwartz T, Schwartz K, **Wang C**, Zimmerman J. December 6, 2010. Detection of anti-PRRSV antibodies in oral fluid samples from individual boars using a commercial PRRS ELISA. Proc 91st Ann Meet Conference of Research Workers in Animal Diseases, Abstr #146.

28. Kittawornrat A, M Engle, W Chittick, J Johnson, D Patnayak, **C Wang**, D Whitney, C Olsen, J Prickett, T Schwartz, K Schwartz, J Zimmerman. November 13, 2010. Porcine reproductive and respiratory syndrome virus (PRRSV) in serum and oral fluid samples from individual boars: Will oral fluid replace serum for PRRSV surveillance? 53rd Annual Conference, American Association of Veterinary Laboratory Diagnosticians. Minneapolis, Minnesota. P51
27. Kittawornrat A, M Engle, W Chittick, J Johnson, D Patnayak, **C Wang**, D Whitney, C Olsen, J Prickett, T Schwartz, K Schwartz, J Zimmerman. November 13, 2010. Detection of anti-PRRSV antibodies in oral fluid samples from individual boars using a commercial ELISA. 53rd Annual Conference, American Association of Veterinary Laboratory Diagnosticians. Minneapolis, Minnesota. P52
26. **Wang C**, Prickett J, Hoogland M, Main R, Rademacher C, Chittick W, Kolb J, Kurtz A, Kurtz E, Muñoz R, Zimmerman JJ. September 2010. Probability of detecting a singleton PRRSV viremic pig using pen-based oral fluid samples. Allen D. Leman Swine Conference. St. Paul, Minnesota, p. 47.
25. Kittawornrat A, M Engle, W Chittick, J Johnson, D Patnayak, **C Wang**, D Whitney, C Olsen, J Prickett, T Schwartz, K Schwartz, J Zimmerman. September 2010. Virus del síndrome respiratorio y reproductivo porcino (PRRSV) en suero y fluidos orales de sementales alojados individualmente. ¿Reemplazarán los fluidos orales al suero en estudios de vigilancia epidemiológica para PRRSV? XXII Congreso Panamericano de Ciencias Veterinarias. Lima, Peru.
24. Jergens AE, Nettleton D, Suchodolski JS, Wymore M, Wilke V, Dowd S, Steiner JM, **Wang C**, Wannemuehler MJ, (2010). Relationship of mucosal gene expression to microbiota composition in dogs with inflammatory bowel disease. *Journal of Veterinary Internal Medicine*, 24(3), 725-725, meeting abstract: 177.
23. Morrison J, Jergens A, Deitz K, Miles K, King R, **Wang C**, Winter M, Flatjord C, Hodnefield A (2010). Comparison of models for predicting renal disease following i-131 therapy for feline hyperthyroidism. *Journal of Veterinary Internal Medicine*, 24(3), 744-745, meeting abstract: 242.
22. Morrison J, Jergens A, Deitz K, Miles K, King R, **Wang C**, Winter M, Flatjord C, Hodnefield A (2010). Investigation of prognostic factors for the development of renal disease following i-131 therapy in feline hyperthyroidism. *Journal of Veterinary Internal Medicine*, 24(3), 725-725, meeting abstract: 243.
21. Morrison J, Clemans J, **Wang C** (2010). Retrospective investigation of survival factors in canine disseminated histoplasmosis. *Journal of Veterinary Internal Medicine*, 24(3), 744-745, meeting abstract: 305.
20. Kittawornrat A, Engle M, Johnson J, **Wang C**, Whitney D, Olsen C, Prickett J, Schwartz T, Schwartz K, Zimmerman J. (2010). Colección de muestras de fluidos orales para diagnóstico de sementales individuales. XXII Congreso Panamericano de Ciencias Veterinarias. Lima, Peru.
19. Irwin CK, O'Connor A, **Wang C**, Yoon KJ, Zimmerman J. (2010). Assessing the evidence of published studies reporting factors associated with the stability of influenza in the environment using a systematic review. *Proceedings of the American Association of Swine Veterinarians*. Omaha, Nebraska, pp. 363.



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17. Cutler TD, Hoff SJ, **Wang C**, Warren KJ, Zhou F, Qin Q, Miller C, Ridpath JF, Yoon K-J, Zimmerman J. March 2010. UV254 inactivation of selected viral pathogens. Proceedings of the American Association of Swine Veterinarians. Omaha, Nebraska, pp. 115.
16. Kittawornrat A, Engle MJ, Johnson JF, Chittick WA, Prickett JR, Schwartz TJ, Whitney DJ, Olsen CW, Schwartz KJ, **Wang C**, Zimmerman. 2010. Use of oral fluid samples to detect PRRSV infection in individual boars. Proceedings of the 21st International Pig Veterinary Society Congress. Vancouver, Canada, p. 201.
15. Kittawornrat A, Chittick W, Stensland W, Prickett JR, **Wang C**, Strait E, Yoon K-J, Zimmerman JJ. July 2010. Optimization of PRRS PCR for oral fluid testing. Proceedings of the 21st International Pig Veterinary Society Congress. Vancouver, Canada, p. 484.
14. Cutler TD, Hoff SJ, **Wang C**, Warren KJ, Zhou F, Qin Q, Miller C, Ridpath J, Yoon K-J, Zimmerman JJ. July 2010. UV254 inactivation of selected viral pathogens. Proceedings of the 21st International Pig Veterinary Society Congress. Vancouver, Canada, p. 936.
13. Johnson J, Engle M, Kittawornrat A, Prickett JR, Schwartz, T, Whitney D, Olsen C, Schwartz K, **Wang C**, Zimmerman J. July 2010. Oral fluid diagnostic samples can be collected from individually-penned adult swine. Proceedings of the 21st International Pig Veterinary Society Congress. Vancouver, Canada, p. 512.
12. Cutler TD, Kittawornrat A, Hoff SJ, **Wang C**, Zimmerman JJ. July 2010. Median infectious dose (ID<sub>50</sub>) of PRRSV isolate MN-184 for young pigs via aerosol exposure. Proceedings of the 21st International Pig Veterinary Society Congress. Vancouver, Canada, p. 506.
11. Lin K, **Wang C**, Murtaugh M, Wong S, Yoon K-J, Halbur PG, Zimmerman J, Meng X-J, Ramamoorthy S. June 2010. A micro-bead array (MBA)-based immunoassay for the simultaneous detection of antibody responses to porcine circovirus type 2 (PCV2) and porcine reproductive and respiratory syndrome virus (PRRSV). Proc 49th North Central Conference of Veterinary Laboratory Diagnosticians. Manhattan, Kansas.
10. Christensen BW, **Wang C**, Penfold LM. Developing a cooled semen protocol for captive breeding of Somali wild ass (*Equus africanus somaliensis*). 7th Biennial Meeting of the Association for Applied Animal Andrology, August 28-29, 2010, Sydney, Australia, 2010.
9. Christensen BW, **Wang C**, Citino S, Penfold LM. Developing a cooled semen protocol for captive breeding of okapi (*Okapia johnstoni*). 7th Biennial Meeting of the Association for Applied Animal Andrology, August 28-29, 2010, Sydney, Australia, 2010.
8. Christensen BW, Bauman K, Junge R, VanSant L, Lorton S, **Wang C**, Asa CS. Semen cryopreservation and transcervical insemination in the Mexican gray wolf (*Canis lupus baileyi*). Annual meeting of the American Association of Zoo Veterinarians, October 23-29, 2010, South Padre Island, Texas, 2010.
7. Cutler TD, Kittawornrat A, Hoff SJ, **Wang C**, Zimmerman JJ. (2009). Infectious dose (ID<sub>50</sub>) of PRRSV isolate MN-184 for young pigs via aerosol exposure. Proc 2009 International PRRS Symposium. Chicago, Illinois, p 67.

6. Cutler TD, Hoff SJ, **Wang C**, Warren KJ, Zhou F, Qin Q, Miller C, Ridpath JF, Yoon K-J, Zimmerman J. (2009). UV254 inactivation of selected viral pathogens. Proc 2009 International PRRS Symposium. Chicago, Illinois, p 66.
5. Cutler T, Hoff S, **Wang C**, Warren K, Zhou F, Qin Q, Miller C, Ridpath J, Yoon K-J, Zimmerman J. (2009). UV254 Inactivation of Selected Viral Pathogens. 52st Annual Conference, American Association of Veterinary Laboratory Diagnosticians. San Diego, California, p. 124.
4. Cutler T, Kittawornrat A, Hoff S, **Wang C**, Zimmerman J. (2009). Median infectious dose (ID50) of PRRSV isolate MN-184 for young pigs via aerosol exposure. 52st Annual Conference, American Association of Veterinary Laboratory Diagnosticians. San Diego, California, p. 110.
3. Cutler TD, Hoff SJ, **Wang C**, Warren KJ, Zhou F, Qin Q, Miller C, Ridpath JF, Yoon K-J, Zimmerman J. December 2009. UV254 inactivation of selected viral pathogens. Proc 90th Ann Meet Conference of Research Workers in Animal Diseases, Abstr #23.
2. **Wang, C.**, Turnbull, B. W., Gröhn, Y. T. (2007). Adjusting ROC curve estimates for covariates without gold standard tests, 2006 Proceedings of the American Statistical Association, Statistics in Epidemiology Section, Seattle, WA: American Statistical Association, 2645-2649.
1. **Wang, C.**, Turnbull, B. W., Gröhn, Y. T. (2005). A flexible Bayesian approach to estimate ROC curves when there is no gold standard test, 2005 Proceedings of the American Statistical Association, Biometry Section, Minneapolis, MN: American Statistical Association, 407-410.

## PROFESSIONAL ASSOCIATIONS

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- ◆ American Statistical Association (ASA)
- ◆ Institute of Mathematical Statistics (IMS)
- ◆ International Biometric Society (ENAR)
- ◆ American Dairy Science Association (ADSA)
- ◆ American Association of Veterinary Laboratory Diagnosticians (AAVLD)
- ◆ International Chinese Statistical Association (ICSA)

## PROFESSIONAL ACTIVITIES

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- ◆ US SHIP (Swine Health Improvement Plan) Sampling and Testing Committee (2021)
- ◆ Living Systematic Review Animal Feeding Operations and Human Health panel (2021)
- ◆ Technical Committee of the USDA North Central Regional Project 229: Detection and control of porcine reproductive and respiratory syndrome virus and emerging viral diseases of swine. (2014-present)
- ◆ Editorial Consultant Board of peer-reviewed *Equine Veterinary Journal* (2011-present)
- ◆ External peer reviewer for professional journals
  - Biometrics*
  - Bioinformatics*
  - Canadian Veterinary Journal*
  - Contemporary Clinical Trials*

- Equine Veterinary Journal*  
*Indian Journal of Statistics*  
*Journal of Applied Statistics*  
*Journal of Virological Methods*  
*Journal of Wildlife Diseases*  
*PLOS ONE*  
*Preventive Veterinary Medicine*  
*Statistical Applications in Genetics and Molecular Biology*  
*Statistics in Biosciences*  
*Statistics in Medicine*  
*Veterinary Record*
- ◆ External peer reviewer for book proposals  
*CRC Press, Taylor & Francis Group, London, UK*
  - ◆ Chair for Topic Contributed Session 459 -- Shrinkage Theory and its Applications, *Joint statistical meetings*, Salt Lake City, UT, 2007
  - ◆ Organizer for Invited Session 26 -- Statistical Methods in Disease Surveillance, *ICSA/ISBS Joint Statistics Conference*, Bethesda, MD, USA, 2013

## HONORS and AWARDS

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- ◆ Editor's Choice, *Preventive Veterinary Medicine*, 2021.
- ◆ Student Paper Award, the Statistics in Epidemiology Section, American Statistical Association, 2006
- ◆ Paper Award, Johnes' Disease Integrated Program (JDIP) 2nd Annual Conference, 2006
- ◆ Best Student Paper Award, International Chinese Statistical Association, 2005
- ◆ Graduate School Travel Award and Fellowship, Cornell University 2005, 2006
- ◆ Excellent Academic Award, Peking University, 2000
- ◆ Eaglet Award, Peking University, 1998, 1999
- ◆ Freshman Scholarship, Peking University, 1997
- ◆ Silver Medal in CMO (Chinese Mathematics Olympic), 1997

## GRADUATE PROGRAM OF STUDY COMMITTEES

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### Current

- ◆ Major professor for 3 PhD students
 

|                |            |               |
|----------------|------------|---------------|
| McKeen, Lauren | Statistics | expected 2023 |
| Morris, Paul   | Statistics | expected 2023 |
| Ye, Fangshu    | Statistics | expected 2024 |
  
- and 1 MS student:
 

|             |            |               |
|-------------|------------|---------------|
| Pang, Jinji | Statistics | expected 2023 |
|-------------|------------|---------------|
  
- ◆ Committee member for 7 PhD students
 

|                  |                                |
|------------------|--------------------------------|
| Zhao, Wenting    | Statistics                     |
| Silva, Ana Paula | Veterinary Microbiology        |
| Huang, Minhong   | Molecular and Cellular Biology |
| Wannarat, Yim-im | Veterinary Microbiology        |
| Li, Xiaoyin      | Economics                      |

|                    |                                |
|--------------------|--------------------------------|
| Badvela, Mani      | Meat Science                   |
| O'Neill, Kevin     | Veterinary Microbiology        |
| and 2 MS students. |                                |
| Zhu, Jinhui        | Veterinary Preventive Medicine |
| Bernhard, Paul     | Statistics                     |

## Completed

- ◆ Major Professor for 9 PhD students
 

|               |            |      |
|---------------|------------|------|
| Hu, Dapeng    | Statistics | 2021 |
| Zhang, Min    | Statistics | 2021 |
| Ji, Ju        | Statistics | 2019 |
| Goren, Emily  | Statistics | 2019 |
| Du, Yingzhou  | Statistics | 2018 |
| Yuan, Chaohui | Statistics | 2018 |
| Sun, Yaxuan   | Statistics | 2017 |
| Liu, Fangfang | Statistics | 2015 |
| Lin, Hui      | Statistics | 2013 |
  
- and 10 MS students
 

|                |            |      |
|----------------|------------|------|
| McKeen, Lauren | Statistics | 2020 |
| Morris, Paul   | Statistics | 2020 |
| Liu, Pu        | Statistics | 2020 |
| Zhao, Jing     | Statistics | 2019 |
| Wang, Chao     | Statistics | 2015 |
| Ji, Ju         | Statistics | 2015 |
| Sun, Yaxuan    | Statistics | 2014 |
| Du, Yingzhou   | Statistics | 2014 |
| Fang, Yinan    | Statistics | 2013 |
| Lin, Hui       | Statistics | 2011 |
  
- ◆ Committee member for 24 PhD students
 

|                        |  |
|------------------------|--|
| Tian, Qinglong         | Statistics   |
| Cheng, Ting-Yu         | Veterinary Microbiology                            |
| Moura, Cesar A. A.     | Population Sciences in Animal Health               |
| Bi, Ran                | Statistics   |
| Chakraborty, Pranamesh | Civil, Construction, and Environmental Engineering |
| Meijer, Nathan         | Kinesiology  |
| Wang, Zhonglei         | Statistics   |
| Rotolo, Marisa         | Veterinary Microbiology                            |
| Poonsuk, Korakrit      | Veterinary Microbiology                            |
| Agbemaflle, Isaac      | Nutritional Sciences                               |
| Ulloa, Nehemias        | Statistics   |
| Trevisan, Giovanni     | Population Sciences in Animal Health               |
| Chen, Qi               | Veterinary Microbiology                            |
| Shi, Heliang           | Biomedical Sciences                                |
| Michaud, Nicholas      | Statistics   |

|                      |   |
|----------------------|---|
| Zhao, Xuefei         | Agricultural and Biosystem Engineering            |
| Irwin, Christa K.    | Veterinary Microbiology                           |
| Panyasing, Yaowalak  | Veterinary Microbiology                           |
| Kittawornrat, Apisit | Veterinary Microbiology                           |
| Wang, Bing           | Veterinary Microbiology                           |
| Stanton, Brendon     | Mathematics                                       |
| Carruthers, Michael  | Veterinary Microbiology                           |
| Zhang, Yinghui       | Nutritional Sciences                              |
| Bai, Yang            | Kinesiology                                       |
| and 10 MS students   |   |
| Wang, Hao            | Statistics  |
| Streauslin, Nicholas | Veterinary Microbiology and Preventative Medicine |
| Li, Gerui            | Food Science & Technology                         |
| Redifer, Colby       | Animal Science                                    |
| Hare, Eric           | Statistics  |
| Michaud, Nicholas    | Statistics  |
| Krausch, Julianne    | Food Science & Technology                         |
| Hua, Hong            | Statistics  |
| Robb, Caleb          | Veterinary Preventive Medicine                    |
| Chittick, Wayne A.   | Veterinary Preventive Medicine                    |

## TEACHING EXPERIENCES

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At Iowa State University:

- ◆ **Instructor-in-charge for VDPAM 527:** Applied Statistical Methods in Population Studies, Iowa State University, Fall 2009, Fall 2011, Fall 2013, Fall 2015, Fall 2017, Fall 2019, Fall 2021
- ◆ **Instructor-in-charge for STAT 587:** Statistical Methods for Researchers, Iowa State University, Fall 2019, Fall 2020
- ◆ **Instructor (one lecture) for VDPAM 562X:** Applied Diagnostic Technologies and Medicine for Infectious Disease, Iowa State University, Fall 2020
- ◆ **Instructor-in-charge for STAT 401:** Statistical Methods for Researchers, Iowa State University, Fall 2009, Fall 2010, Fall 2011, Fall 2014, Fall 2015, Fall 2017
- ◆ **Instructor-in-charge for STAT 565:** Methods in Biostatistics and Epidemiology, Iowa State University, Fall 2013, Fall 2016
- ◆ **Instructor-in-charge for STAT 430:** Empirical Methods for Computer Scientists, Iowa State University, Fall 2012

Elsewhere:

- ◆ **Instructor-in-charge for STA 570:** Basic Statistical Analysis, University of Kentucky, Fall 2008
- ◆ **Instructor-in-charge for CPH 930:** Advanced Biostatistics Methods in Public Health, University of Kentucky, Spring 2008
- ◆ **Instructor-in-charge for STA 291:** Statistical Method, University of Kentucky, Fall 2007

- ◆ **Instructor-in-charge for MATH 171:** Statistical Theory and Application, Cornell University, Fall 2006, Spring 2007

## INSTITUTIONAL SERVICE

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| <b>Role</b> | <b>Committee</b>   | <b>Period of Service</b> |
|-------------|--|--------------------------|
| Member      | Computer, Library & Information Management Committee, College of Veterinary Medicine | 2020-2022                |
| Member      | Research and Graduate Studies Committee, VDPAM                                       | 2019-2022                |
| Member      | Karas Award Committee, Iowa State University   | 2019-2020                |
| Judge       | College of Veterinary Medicine Research Day Poster Competition                       | 2019-2021                |
| Member      | Faculty Search Committee, VDPAM  | 2019-2021                |
| Member      | Exam Committee, Statistics   | 2019-2020                |
| Member      | Research and Graduate Studies Committee, VDPAM                                       | 2015-2019                |
| Member      | Award Committee, Statistics  | 2015-2019                |
| Chair       | Minor Committee, Statistics  | 2013-2015                |
| Member      | IT Committee, VDPAM  | 2011-2014                |
| Member      | Minor Committee, Statistics  | 2011-2013                |
| Member      | Library Committee, Statistics  | 2009-2014                |
| Member      | Social Committee, Statistics   | 2009-2013                |