Jinji Pang

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EDUCATION

Ph.D., Veterinary Microbiology and Preventive Medicine **Aug 2018 – Expected Dec 2023**
Iowa State University (ISU), Ames, IA
Major: Veterinary Microbiology (GPA: 3.95/4.0)
Dissertation: Microbiota-based intervention for preharvest control of *Campylobacter* in poultry
Major Professors: Dr. Qijing Zhang & Dr.Orhan Sahin, Department of Veterinary Microbiology and Preventive Medicine

M.S., Statistics **Aug 2020 - Dec 2022**
Iowa State University (ISU), Ames, IA
Major: Statistics (GPA: 3.97/4.0)
Thesis: Nonparametric bootstrap methods for interval estimation of the area under the ROC curve for correlated diagnostic test data
Major Professor: Dr. Chong Wang, Department of Statistics, Department of Veterinary Diagnostic and Production Animal Medicine

Doctor of Veterinary Medicine (DVM) **Aug 2013 - June 2018**
China Agricultural University (CAU), Beijing, China
Major: Veterinary Medicine
Thesis: Effect of polymyxin resistance genes *mcr*-1~5 on drug resistance and in vitro growth ability of *Escherichia coli*

RESEARCH FOCUS

I work on a USDA-funded project where I am studying microbiota-based interventions for preharvest control of *Campylobacter* in poultry. So far, I have conducted various experiments including animal studies to evaluate the effect of fecal microbiota transplantation, antibiotic treatment, and probiotic treatment on the cecal microbiota and metabolites of animals challenged with *Campylobacter jejuni.* I am also a statistician specializing in bioinformatics, model development and statistical consulting.

RESEARCH EXPERIENCES

Graduate Research Assistant / Veterinary Microbiology
Iowa State University, Ames, IA **Aug 2018 - Present**

- Leading a USDA-NIFA funded project which is focused on investigating novel microbiota-based interventions to control the leading foodborne pathogen *Campylobacter* from the source, e.g., poultry farms
- Conducted multiple in vitro studies to screen promising probiotic candidates from chicken cecal microbiota against *Campylobacter*
- Completed multiple animal studies independently to evaluate the effect of fecal microbiota transplantation, antibiotic treatment, and probiotic treatment on the cecal microbiota and metabolites of broilers challenged with *Campylobacter jejuni*

- Participated in the FDA NARMS (National Antimicrobial Resistance Monitoring System) retail meat project in Iowa. The major goal of NARMS project is to detect and isolate foodborne bacterial species including *C. jejuni*, *C. coli*, *Salmonella*, *E. coli*, *Enterococcus* from retail meat species. Isolates identification and antibiotic resistance of the isolates are also further investigated by MALDI-TOF and MIC test
- Assisted with multiple *Campylobacter* vaccines, antibiotic treatment, and host-pathogen interaction trials in cattle, chicken, and sheep
- Customized Linux programming pipelines to conduct 16S rRNA sequencing analysis to analyze sequencing data for elucidating the gut microbiota difference between *Campylobacter*-positive and *Campylobacter*-negative flocks
- Expressed and purified CosR (*Campylobacter* oxidative stress regulator) protein for structural and functional investigation purposes
- Investigated the potential of using PPMO (peptide-conjugated phosphorodiamidate morpholino oligomers) to inhibit *C. jejuni* in *in vitro* system
- Successfully collaborated and published 4 papers with colleagues from different background, such as USDA, Electrical and Computer Engineering, and Pharmacology
- Contributed to other colleague's research by offering statistical assistance, including experimental design, data analysis, and data visualization
- Analyzed 1000+ data sets by GLM, Chi-square, Logistic regression, and ROC in R and SAS, and visualized analysis results for conference presentations and publications
- Mentored two undergraduate students and two lab technicians
- Published peer-reviewed papers, 5 USDA annual reports, multiple manuscripts for peer-reviewed journals, abstracts, and presented 5 conference oral presentations (Google Scholar)

Graduate Research Assistant / Statistics **Aug 2020 - Present**
Iowa State University, Ames

- Analysed real diagnostic assay data set, which contains more than 1000 measurements from 72 subjects and developed two novel non-parametric bootstrap methods to calculate the confidence interval of the AUC for correlated diagnostic test data using R and statistical theory
- Performed simulation studies to verify the accuracy of different bootstrap methods and proved the two novel methods overbeat the traditional method, which significantly improves the accuracy of data analysis of diagnostic assay development experiments
- Compiled and uploaded the R codes (two novel bootstrap methods) on GitHub for research reproducibility and dissemination
- Co-developed an open-source **R package** (ggpaintr; github.com/willju-wangqian/ggpaintr) for building modularized shiny apps with plotting functionalities using ggplot2 and the Grammar of Graphics

Undergrad Research Assistant / Key Laboratory of Animal Antimicrobial Resistance **Oct 2017 - May 2018**
China Agricultural University, Beijing, China

- Constructed TOP10-pBAD-mcr-1~5 expression vectors
- Conducted polymyxin susceptibility test of E. coli with mcr-1~5 gene expression
- Wrote standard operating procedures and undergrad dissertation

Zoetis-One Health intern at College of Veterinary Medicine, ISU. **Jun 2017- Sep 2017**
Infectious Disease Pathogen Summer Scholar

- Conducted an animal study to investigate the prevalence of fluoroquinolone-resistant *Campylobacter* in sheep
- Isolated and identified more than 1500 isolates from sheep fecal and bile samples
- Tested the antimicrobial susceptibility of 236 *Campylobacter jejuni* isolates
- Published 1 first-coauthor paper in Applied and Environmental Microbiology (ASM journal)

Undergrad Research Assistant / Laboratory of Anatomy of Domestic Animals **Jan 2015 - Nov 2016**

China Agricultural University, Beijing, China

- Conducted in vivo study using chicken embryo
- Determined the effect of monochromatic green light on chick with ELISA, RT-PCR, and immunohistochemistry
- Published 1 first-author paper in the Chinese Journal of Animal and Veterinary Sciences

INTERNSHIPS

Alltech intern at Clonakilty Agricultural University, Ireland
Undergraduate Intern **Jan 2017- Mar 2017**
Research focus: Milking parlor management in Ireland

- Studied the dairy industry on the farm of Clonakilty Agricultural University for three weeks
- Conducted field research about "Milking Parlor Management" in dairy and beef farms in Ireland

Elite Cattlemen Program, Delaval Inc, China
Undergraduate Intern **Jun 2016 - Sep 2016**
Research focus: Dairy farm management in China

- Translated manufacturing material lists from Chinese into English
- Worked as an interpreter for foreign after-market business managers and native trainees

SKILLS

Biological and Bioinformatics: Aseptic technique, animal study, PCR, ELISA, MIC, SDS-PAGE, cell culture, IHC, growth assay, MALDI-TOF, experiment design, protocol writing, proposal writing, teaching, training, oral presentation, 16S rRNA sequencing, DNA sequencing, microbiota analysis, bacteria culture under aerobic, anaerobic, microaerophilic conditions, metabolomics, protein expression, freeze-dry processes. QIIME 2, R, and Linux

Statistical Analysis: Generalized Linear Model, ANOVA, Time Series, Bayesian, Statistical Inference, Parametric & Non-Parametric & Correlation & Differential Abundant Analyses

Programming Language and Simulation: R, SAS, CPP

Miscellaneous: Word, Excel, PowerPoint, Outlook, LaTeX, GitHub

PUBLICATIONS

1. **Pang, J.**; Looft, T.; Zhang, Q.; Sahin, O. Deciphering the association between *Campylobacter* colonization and microbiota composition in the intestine of commercial broilers. *Microorganisms* 2023,11,1724. https://doi.org/10.3390/microorganisms11071724
2. Sahin, O.; **Pang, J.**; Tang, Y.; Adiguzel, M.C.; Wang, C.; Zhang, Q. A longitudinal study on Campylobacter in conventional commercial broiler flocks in the United States: prevalence and genetic diversity. Avian Dis. 2023, submitted
3. Xia, J., **Pang, J. (co-first author);** Tang, Y., Wu, Z., Dai, L., Singh, K., . . . Zhang, Q. (2019). High prevalence of fluoroquinolone-resistant Campylobacter bacteria in sheep and increased *Campylobacter* counts in the bile and gallbladders of sheep medicated with tetracycline in feed.

Applied and Environmental Microbiology, 85(11). https://doi.org/10.1128/AEM.00008-19

4. Goulart, D.B.; Beyi, A.F.; Wu, Z.; Adiguzel, M.C.; Wilson, S.; Xu, C.; **Pang, J**.; Dewell, R.; Dewell, G.A.; Plummer, P.J.; Zhang, Q.; Sahin, O. Influence of Single Dose Enrofloxacin Injection on Development of Fluoroquinolone Resistance in *Campylobacter jejuni* in Calves. Antibiotics 2022, 11, 1407. https://doi.org/10.3390/antibiotics11101407
5. Monshat, H., Wu, Z., **Pang, J**., Zhang, Q., & Lu, M. (2020). Integration of Plasmonic Heating and on-chip temperature sensor for nucleic acid amplification assays. Journal of Biophotonics, 13(7). doi:10.1002/jbio.202000060
6. Adiguzel, M. C., Goulart, D. B., Wu, Z., **Pang, J**., Cengiz, S., Zhang, Q., & Sahin, O. (2021). Distribution of CRISPR types in fluoroquinolone-resistant *Campylobacter jejuni* isolates. Pathogens,10(3), 345. doi:10.3390/pathogens10030345
7. Monshat, H., Qian, J., **Pang, J**., Parvin, S., Zhang, Q., Wu, Z., & Lu, M. (2022). Integration of nucleic acid amplification, detection, and melting curve analysis for rapid genotyping of antimicrobialresistance. IEEE Sensors Journal, 22(8), 7534-7541. doi:10.1109/jsen.2022.3156378
8. **Pang, J**., and Bai, X., and Chen, S., and Jiang, W., and Wang, Z., and Cao, J., and Dong, Y., & Chen, Y. (2017). The effect of monochromatic green light on melatonin synthesis in chick embryo. Chinese Journal of Animal and Veterinary Sciences. 2017 Vol.48 No.5 pp.938-944 ref.32

Publications in Preparation

1. Nonparametric bootstrap methods for interval estimation of the area under the ROC curve for correlated diagnostic test data: application to whole-virus ELISA testing in swine, going to submit to Frontiers in Veterinary Science
2. Fecal microbiota transplantation reduces *Campylobacter jejuni* colonization in young broiler chickens in direct infection model but not in the seeder bird infection model, plan to submit to Microbiology Spectrum (ASM journal)
3. Effect of enrofloxacin on cecal microbiota and metabolites of broiler chickens challenged with *Campylobacter jejuni*
4. In vitro and in vivo activity of *Lactobacillus* strains against *Campylobacter jejuni*

CONFERENCE PRESENTATIONS

1. **Pang, J**., Sahin, O., Zhang, Q. In vitro and in vivo activity of Lactobacillus strains against Campylobacter jejuni. Poster presentation at American Society for Microbiology (ASM 2023), Houston, USA.

2. **Pang, J**., Sahin, O., Zhang, Q. Effect of enrofloxacin on cecal microbial diversity and composition of broiler chickens challenged with *Campylobacter jejuni*. Oral presentation at Conference of Research Workers in Animal Diseases (CRWAD 2023), Chicago, USA.
3. **Pang, J**., Looft, T., Sahin, O., Zhang, Q. Deciphering the association of cecal microbiota with *Campylobacter* colonization status in broiler chickens. Oral presentation at *Campylobacter, Helicobacter* and Related Organisms Conference (CHRO 2022), Yangzhou, China.
4. **Pang, J**., Sahin, O., Zhang, Q. Effect of enrofloxacin on cecal microbial diversity and composition of broiler chickens challenged with *Campylobacter jejuni*. Poster presentation at American Society for Microbiology (ASM 2022), Washington D.C., USA.
5. **Pang, J**., Sahin, O., Zhang, Q. The effect of fecal microbiota transplantation on *Campylobacter jejuni* colonization in young broiler chicks using a seeder-bird infection model. Oral presentation at Conference of Research Workers in Animal Diseases (CRWAD 2021), Chicago, USA.
6. **Pang, J**., Sahin, O., Zhang, Q. Evaluation of microbiota-based interventions as a preharvest control strategy for *Campylobacter* in poultry. Online oral presentation at American Society for Microbiology (ASM 2020), Chicago, USA.
7. **Pang, J**., Sahin, O., Zhang, Q. Protection against *Campylobacter* by fecal microbiota transplantation in newly hatched broiler chickens. Online oral presentation at Conference of Research Workers in Animal Diseases (CRWAD 2020), Chicago, USA.

HONORS & AWARD & GRANTS

- Travel Award, College of Veterinary Medicine Research Office, 2023.
- Travel Award, College of Veterinary Medicine Research Office, 2022.
- Professional Advancement Grants, Graduate and Professional Student Senate, 2022.
- Travel Award, College of Veterinary Medicine Research Office, 2021.
- Professional Advancement Grants, Graduate and Professional Student Senate, 2021.
- 2nd Place Graduate Student Poster Award. Awarded by ISU College of Vet Med, 2021.
- Freese Scholarship in Veterinary Microbiology, Awarded by ISU College of Vet Med, 2021.
- Finalist of 3MT Thesis Competition. Awarded by ISU Graduate College, 2019.
- Excellent graduate of Beijing. Awarded by Beijing's Ministry of Education, 2018.
- National Scholarship. Awarded by China's Ministry of Education, 2017.
- 1st Class Scholarship for Outstanding Students. China Agricultural University, 2017.
- 2017 Dubai Equine Scholarship. Darley Company, 2017.
- Merit Students, China Agricultural University, 2014,2015,2016.
- Outstanding Student Leaders, China Agricultural University, 2014,2015,2016.
- 2nd Class Scholarship for Outstanding Students, China Agricultural University, 2014,2015.

SERVICES & LEADERSHIPS

❖ **College of Veterinary Medicine Association of Graduate Students** **Aug 2021 - Jun 2022**

Position: Vice President

- Communicated relevant information, including financial aids, mental health services, internship opportunities, from the department to graduate students
- Organized monthly events, such as graduate student networking, internship application workshops, career services

❖ **Martial Arts Club, ISU, Ames, IA** **Aug 2020 - May 2021**

Position: Secretary

- Organized weekly practice and club events during Covid pandemic and ensured safety and healthy exercise of martial arts club members
- Organized club fundraising activities

PROFESSIONAL MEMBERSHIPS

Member of American Society for Microbiology (ASM) **2020 - Present**

GRANT

USDA-NIFA funding: Microbiota-based intervention for preharvest control of *Campylobacter* in poultry

Award No: 2018-67017-28117

Project Director: Dr. Sahin Orhan, Iowa State University

LANGUAGES

English – Full professional proficiency
Chinese – Native
Korean – Elementary proficiency

REFERENCES

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