

Author Identifier

<https://orcid.org/0000-0003-4747-9189>**Degrees Held**

Degree	Institution	Year
D.V.M. Veterinary Medicine	Iowa State University	1997
Ph.D. Veterinary Pathology	Iowa State University	2011

Summary of Career Employment

- 2021 - present **Professor**, Diagnostic Pathologist, Pathology Section Leader
Dept. of Veterinary Diagnostic and Production Animal Medicine and Veterinary Diagnostic Laboratory, Iowa State University, Ames, IA
Appointment: 20% Research, 15% Instruction, 55% Professional Practice, 10% ISU Service
- 2016 - 2021 **Associate Professor**, Diagnostic Pathologist, Pathology Section Leader
Dept. of Veterinary Diagnostic and Production Animal Medicine, Iowa State University
- 2011 - 2016 **Assistant Professor**, Diagnostic Pathologist
Dept. of Veterinary Diagnostic and Production Animal Medicine, Iowa State University
- 2007 - 2011 **Adjunct Instructor**, Anatomic Pathology Resident
Department of Veterinary Pathology, Iowa State University, Ames, IA
- 2000 - 2007 **Assistant / Associate Professor**, Animal Health Technology
Department of Agricultural Sciences
Kirkwood Community College, Cedar Rapids, IA
- 1997 - 2000 **Associate Veterinarian**, Ottumwa Veterinary Clinic, Ottumwa, IA

Board Certification

- 2010 Diplomat, American College of Veterinary Pathologists (Anatomic Pathology)

Honors and Awards

- 2017 - 2018 Iowa State University Emerging Leaders Academy
- 2013 Iowa State University CVM Award for Early Achievement in Research
- 2012 - 2017 Boehringer Ingelheim Vetmedica Professorship in Food Animal Infectious Diseases

Membership in Professional Societies

- American College of Veterinary Pathologists (2010-present)
- American Association of Veterinary Laboratory Diagnosticians (2011-present)
- American Association of Swine Veterinarians (2011-present)
- American Veterinary Medical Association (1997-present)

Invited Presentations (Selected)

1. Enteric Diseases of Pigs. Davis-Thompson Foundation Day Seminar on Pig Diseases (2 hours RACE CE approved), 2020. December 15, delivered virtually via Zoom.
2. Annual Veterinary Diagnostics Conference, 2019. *The role of pathology in the diagnosis of veterinary infectious disease*. June 4, Shanghai, China.
3. American Veterinary Medical Association Annual Convention, 2018. *Applications of NGS technology in veterinary diagnostics: Detection vs disease discovery*. July 13, Denver, CO, USA.
4. International Pig Veterinary Society Congress, Elanco Satellite Seminar, 2016. *Looking into the future: The ecology and occurrence of porcine enteric pathogens*. June 8. Dublin, Ireland.
5. American Association of Swine Veterinarians Annual Meeting, 2016. *Diagnosis: Dissecting diagnostic results to reveal population diagnoses*. February 27-March 1. New Orleans, LA, USA.

6. Italian Society of Pig Health Management (SIPAS) Annual Meeting, 2015. *The epidemiology of swine dysentery in the US and recent research in risk factors, diet, and diagnostic assays*. March 19-20. Montichiari, Italy.
7. International Conference on Colonic Spirochaetal Infections in Animals and Humans, 2013. *Swine dysentery – Re-emergence in the United States and Canada*. September 5-6. Guildford, UK.

Refereed Publications (Selected from 78+)

1. Helm ET, **Burrough ER**, Leite FL, Gabler NK. *Lawsonia intracellularis* infected enterocytes lack sucrose-isomaltase which contributes to reduced pig digestive capacity. *Vet Res* 2021; 52:90.
2. Shen H, Zhang J, Gauger PC, **Burrough ER**, Zhang J, Harmon K, Wang L, Zheng Y, Petznick T, Li G. Genetic characterization of porcine sapoviruses isolated from pigs during a diarrhea outbreak in Iowa, 2019. *Transbound Emerg Dis* 2021; 00:1-10.
3. Trevisan G, Linhares LCM, Schwartz KJ, **Burrough ER**, de Souza Magalhães E, Crim B, Dubey P, Main RG, Gauger P, Thurn M, Lages PTF, Corzo CA, Torrison J, Henningson J, Herrman E, McGaughey R, Cino G, Greseth J, Clement T, Christopher-Hennings J, Linhares DCL. Data standardization implementation and applications within and between diagnostic laboratories: integrating and monitoring enteric coronaviruses. *J Vet Diagn Invest* 2021; 33(3):457-468.
4. Trevisan G, Schwartz KJ, **Burrough ER**, Arruda B, Derscheid RJ, Rahe MC, de Souza Magalhães E, Almeida MN, Main RG, Linhares DL. Visualization of diagnostic data for population health management using porcine disease as a model. *J Vet Diagn Invest* 2021; 33(3):428-438.
5. Derscheid RJ, Rahe MC, **Burrough ER**, Schwartz KJ, Arruda BA. Disease diagnostic coding to facilitate evidence-based medicine: current and future perspectives. *J Vet Diagn Invest* 2021; 33(3):419-427.
6. Lin J-H, Arruda BL, **Burrough ER**. Alteration of colonic mucin composition and cytokine expression in acute swine dysentery. *Vet Pathol* 2021; 58(3):531-541.
7. Helm ET, Gabler NK, **Burrough ER**. Highly fermentable fiber alters fecal microbiota and mitigates swine dysentery during *Brachyspira hyodysenteriae* challenge. *Animals* 2021; 11:396.
8. Chen YM, Helm ET, Groeltz-Thrush JM, Gabler NK, **Burrough ER**. Epithelial-mesenchymal transition of absorptive enterocytes and depletion of Peyer's patch M cells after PEDV infection. *Virology* 2021; 552:43-51.
9. Helm ET, Lin J-H, Gabler NK, **Burrough ER**. *Brachyspira hyodysenteriae* infection reduces digestive function but not intestinal integrity in growing pigs while disease onset can be mitigated by reducing insoluble fiber. *Front Vet Sci* 2020; 7:587926.
10. Chen YM, Helm ET, Gabler N, Hostetter JM, **Burrough ER**. Alterations in intestinal innate mucosal immunity of weaned pigs during porcine epidemic diarrhea virus infection. *Vet Pathol* 2020; 57(5):642-652.
11. Helm ET, Curry SM, De Mille CM, Schweer WP, **Burrough ER**, Gabler NK. Impact of viral disease hypophagia on pig jejunal function and integrity. *PLoS One* 2020; 15(1):e0227265.
12. Sitthicharoenchai P, Derscheid R, Schwartz K, Macedo N, Sahin O, Chen X, Li G, Main R, **Burrough E**. Cases of high mortality in cull sows and feeder pigs associated with *Streptococcus equi* subsp. *zooeconomicus* septicemia. *J Vet Diagn Invest* 2020; 32(4):565-571.
13. Naberhaus S, Krull A, Bradner L, Harmon K, Arruda P, Arruda B, Sahin O, **Burrough E**, Schwartz K, Kreuder A. Emergence of *Salmonella enterica* serovar 4,[5],12:i:- as the primary serovar identified from swine clinical samples and development of a multiplex real-time PCR for improved *Salmonella* serovar-level diagnostics. *J Vet Diagn Invest* 2019; 31(6):818-827.
14. Trevisan G, Linhares L, Crim B, Dubey P, Schwartz KJ, **Burrough ER**, Main RG, Sundberg P, Thurn M, Lages P, Corzo CA, Torrison J, Henningson J, Herrman E, Hanzlicek GA, Raghavan R, Marthaler D, Greseth J, Clement T, Christopher-Hennings J, Linhares D. Macroepidemiological aspects of porcine reproductive and respiratory syndrome virus detection by major United States veterinary diagnostic laboratories over time, age group, and specimen. *PLoS ONE* 2019; 14(10):e0223544.

15. Arruda BL, **Burrough ER**, Schwartz KJ. *Salmonella enterica* I 4,[5],12:i:- associated with lesions typical of swine enteric salmonellosis. *Emerg Infect Dis* 2019; 25(7):1377-1379.
16. Naberhaus SA, Krull AC, Arruda BL, Arruda P, Sahin O, Schwartz KJ, **Burrough ER**, Magstadt DR, Matias Ferreyra F, Gatto IH, de Souza Almeida HM, Wang C, Kreuder AJ. Pathogenicity and competitive fitness of *Salmonella enterica* serovar 4,[5],12:i:- compared to *Salmonella* Typhimurium and *Salmonella* Derby in swine. *Front Vet Sci* 2019; 6:502.
17. **Burrough ER**, De Mille C, Gabler NK. Zinc overload in weaned pigs: tissue accumulation, pathology, and growth impacts. *J Vet Diagn Invest* 2019; 31(4):537-545.
18. Curry SM, Schwartz KJ, Yoon KJ, Gabler NK, **Burrough ER**. Effects of porcine epidemic diarrhea virus infection on nursery pig intestinal function and barrier integrity. *Vet Microbiol* 2017; 211:58-66.
19. **Burrough ER**: Swine dysentery: etiopathogenesis and diagnosis of a re-emerging disease. *Vet Pathol*; 2017; 54(1):22-31
20. Schweer WP, Pearce SC, **Burrough ER**, Schwartz KJ, Yoon KJ, Sparks C, Gabler NK. Effect of PRRS and PED virus co-infection in grower pigs II: Intestinal integrity and function. *J Anim Sci* 2016; 94: 523-532.
21. Schweer WP, Schwartz KJ, **Burrough ER**, Yoon KJ, Sparks C, Gabler NK. Effect of PRRS and PED virus co-infection in grower pigs I: Growth performance and digestibility. *J Anim Sci* 2016; 94(2): 514-522.
22. **Burrough ER**, Arruda BL, Patience JF, Plummer PJ. Alterations in the colonic microbiota of pigs associated with feeding distillers dried grains with solubles (DDGS). *PLoS ONE* 2015; 10(11): e0141337.
23. Wilberts BL, Arruda PHE, Kinyon JM, Frana TS, Wang C, Magstadt DR, Madson DM, Patience JF, **Burrough ER**. Investigation of the impact of increased dietary insoluble fiber through the feeding of distillers dried grains with solubles (DDGS) on the incidence and severity of *Brachyspira*-associated colitis in pigs. *PLoS ONE* 2014; 9(12): e114741.
24. Chen Q, Gauger P, Stafne M, Thomas J, Arruda P, **Burrough E**, Madson D, Brodie J, Magstadt D, Derscheid R, Welch M, Zhang J. Pathogenicity and pathogenesis of a United States porcine deltacoronavirus cell culture isolate in 5-day-old neonatal piglets. *Virology* 2015; 482: 51-59.
25. Wilberts BL, Arruda PH, Kinyon JM, Madson DM, Frana TS, **Burrough ER**. Comparison of lesion severity, distribution, and colonic mucin expression in pigs with acute swine dysentery following oral inoculation with "*Brachyspira hamptonii*" or *Brachyspira hyodysenteriae*. *Vet Pathol* 2014; 51(6): 1096-1108.
26. Warneke HL, Kinyon JM, Bower LP, **Burrough ER**, Frana TS. Matrix-assisted laser desorption ionization time-of-flight mass spectrometry for rapid identification of *Brachyspira* species isolated from swine, including the newly described "*Brachyspira hamptonii*". *J Vet Diagn Invest* 2014; 26(5): 635-639.
27. **Burrough ER**, Wilberts BL, Bower LP, Jergens AE, Schwartz KJ. Fluorescent in situ hybridization for detection of "*Brachyspira hamptonii*" in porcine colonic tissues. *J Vet Diagn Invest* 2013;25(3):407-12.
28. **Burrough ER**, Strait EL, Kinyon JM, Bower LP, Madson DM, Wilberts BL, et al. Comparative virulence of clinical *Brachyspira* spp. isolates in inoculated pigs. *J Vet Diagn Invest* 2012; 24(6): 1025-1034.