

Jill Hagey

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Areas of Specialization:

I am passionate about finding ways to modulate the microbiome to shift its functional potential through a combination of wet lab and bioinformatics analysis. My work has focused on innate mucosal immunology and elucidating ramifications and complexities of host-microbe interactions. I hope to create successful company making biologics that modulate the microbiome of livestock.

Education:

University of California Davis, Davis CA
PhD, Animal Biology with a designated emphasis in Host-Microbe Interactions anticipated fall 2020
MS, Animal Biology December 2015
BS, Cell Biology December 2011

Additional Training:

Business Development Fellow 2019-2020
University of California, Davis Graduate School of Management
• Course work included: Management of Innovation, New and Small Business Ventures, Technology, Completion and Strategy and Entrepreneurship Clinic
UC Entrepreneurship Academy 09/19
University of California, Davis Graduate School of Management
Leadership Challenge Workshop: Leadership Practices Inventory 02/19
University of California, Davis Graduate School of Management
Strategies and Techniques for Analyzing Microbial Population Structures (STAMPS) 08/18
Marine Biological Laboratory, Woods Hole MA

Grants Received:

- California Dairy Research Foundation Grant | **\$19,000** 2019
 - *Validating Nitrogen Fixing Ability of Previously Identified Microorganisms in Cow Manure.*
- Microbiome Graduate Research Grant | **\$1,000** 2019
 - *Identifying Nitrogen Fixing Microbes in the Feces of Cattle.*
- Center for Food Animal Health, Animal Health | **\$20,000** 2017-2018
 - *Engineering and Evaluating a Probiotic Therapy for Combating Salmonella in Dairy Calves*
- Henry A. Jastro Shields Research Grant | **\$3,000** 2015, 2019
 - *Characterizing an Engineered Probiotic, *Lactococcus Lactis*^{sod+}, for Treatment of Bacterial Diarrhea in Dairy Calves.*
 - *Maintaining quiescence in the gut: Interplay between peptidoglycan recognition proteins and lysozyme.*

Awards:

- Little Bang! Business Poster Competition Round 1 Winner 2020
- J. B. Russel Young Scientist Award for Best Poster Presentation 2019
- Grad Student Association's Travel Award 2018
- Provost's Prize and People's Choice for Best Student Organized Session, Interdisciplinary Graduate and Professional Student Symposium 2016
- Animal Biology Executive Committee Travel Award 2015
- Keystone Symposia Underrepresented Trainee Scholarship 2014

Fellowships:

- Business Development Fellow with the Institute for Innovation and Entrepreneurship 2019-2020

- Leland Roy Saxon and Georgia Wood Saxon Fellowship 2013-2014, 2017-2020
- Hart/Cole/Goss Research Fellowship 2015 & 2016
- Graduate Program Fellowship for outstanding academic record 2013-2018

Publications:

- Hagey, J. V.**, Bhatnagar, S., Heguy, J. M., Karle, B. M., Price P. L., Meyer, D., Maga, E. A. (2020). Metagenomic Analysis of the Fecal Microbiome in Dairy Cows Reveal Species Involved in the Nitrogen Cycle. *In Preparation*.
- Hagey, J. V.***, Laabs, M.*, DePeters, E. J. (2020). Rumen Sampling Methods Bias Microbial Communities. *In Preparation*.
- Hagey, J. V.**, Bhatnagar, S., Heguy, J. M., Karle, B. M., Price P. L., Meyer, D., Maga, E. A. (2019). Fecal Microbial Communities in a Large Representative Cohort of California Dairy Cows. *Frontiers of Microbiology*, 10(May), 1-14. <https://doi.org/10.3389/fmicb.2019.01093>
- Garas, L. C., Feltrin, C., Hamilton, M. K., **Hagey, J. V.**, Murray, J. D., Bertolini, L. R., ... Maga, E. A. (2016). Milk with and without lactoferrin can influence intestinal damage in a pig model of malnutrition. *Food & Function*, 7(2), 665–678. <http://doi.org/10.1039/c5fo01217a>
- Chigerwe, M., **Hagey, J. V.**, & Aly, S. S. (2015). Determination of neonatal serum immunoglobulin G concentrations associated with mortality during the first 4 months of life in dairy heifer calves. *Journal of Dairy Research*, 82(04), 400–406. <http://doi.org/10.1017/S0022029915000503>
- Pipkin, K. M., **Hagey, J. V.**, Rayburn, M. C., & Chigerwe, M. (2015). A Randomized Clinical Trial Evaluating Metabolism of Colostral and Plasma Derived Immunoglobulin G in Jersey Bull Calves. *Journal of Veterinary Internal Medicine*, 29, 961-966. doi:10.1111/jvim.12586
- Chigerwe, M., & **Hagey, J. V.** (2014). Refractometer assessment of colostral and serum IgG and milk total solids concentrations in dairy cattle. *BMC Veterinary Research*, 10(1), 178. doi:10.1186/s12917-014-0178-7
- Murphy, J. M., **Hagey, J. V.**, & Chigerwe, M. (2014). Comparison of serum immunoglobulin G half-life in dairy calves fed colostrum, colostrum replacer or administered with intravenous bovine plasma. *Veterinary Immunology and Immunopathology*, 158(3-4), 233–7. doi:10.1016/j.vetimm.2014.01.008
- Chigerwe, M., Coons, D. M., & **Hagey, J. V.** (2012). Comparison of colostrum feeding by nipple bottle versus oroesophageal tubing in Holstein dairy bull calves. *Journal of the American Veterinary Medical Association*, 241(1), 104–9. doi:10.2460/javma.241.1.104

Relevant Experience:

PhD Dissertation UC Davis (PI: Elizabeth Maga, PhD) 9/15 – Present

Dissertation Topic: Surveying the composition and function of the fecal microbiota of dairy cows across California.

- Created a pipeline for 16S amplicon analysis projects:
 - Identifying farm variation in microbial communities of feces and milk from dairy cattle.
 - Proficient in diversity, differential abundance and variability analysis
 - Evaluating differences in microbial populations due to sampling method from the rumen of cattle.
- Analyzing metagenomic data to determine functional differences of the microbiome of cattle and identification of taxonomy contributing to nitrogen cycling and antibiotic resistance.
 - Wrote custom scripts using snakemake, python, bash and R for data manipulation and analysis
- Scripts and description of projects can be found at <https://github.com/jvhagey>
- Engineering *Lactococcus lactis* to secrete SodA for therapeutic use against *Salmonella* and *E. coli* in dairy calves.

Masters Thesis UC Davis (PI: Elizabeth Maga, PhD) 8/13 – 12/15

Thesis Topic: Modulation of Gut Microbes: Interplay between Peptidoglycan Recognition Proteins and Lysozyme.

- Solid foundation in study design and statistical analysis with SAS, R, Adobe Illustrator and GraphPad Prism.
- Used an intestinal cell line, IPEC-J2, to determine expression of peptidoglycan recognition protein-3/4 in response to milk products, commensal and pathogenic bacteria.
- Analyzed gene expression of cytokines and immune receptors via qRT-PCR in a malnourished swine model.

Lab Manager (PI: Munashe Chigerwe, BVSc, MPH, PhD) 1/13 – 9/14

University of California Davis, Department of Medicine and Epidemiology

- Effectively managed administrative all aspects of research projects including budget management, maintained adherence to Standard Operation Procedures and university regulations, hiring, training and data acquisition.

- Achieved completion of multiple concurrent research projects in a timely manner while adhering to a budget.
- Accurately processed and measured immunoglobulins in colostrum and serum via ELISAs and RIDs.
- Designed and optimized new immunoassay protocol for measuring immunoglobulins in feces.
- Independently held interviews and oversaw the training and mentoring of 5 research assistants.

Poster Presentations:

Congress on Gastrointestinal Function

Identification of Microbes Involved in Nitrogen Fixation in Dairy Cow Manure on Farms across California 04/19

International Society of Microbial Ecology

Prevalence of Nitrogen Fixation Genes in Dairy Cattle Feces 08/18

Animal Biology Graduate Group Colloquium

Survey of Microbial Fecal Populations across California Dairies 10/16

Keystone Symposia: "Gut Microbiota Modulation of Host Physiology: The Search for Mechanism"

Lysozyme Transgenic Goat Milk Regulates Expression of Peptidoglycan Recognition Protein 3 & 4 04/15

Teaching and Mentoring:

- Trained over 15 research assistants several of which presented posters at the undergraduate research symposia.
- Teaching Assistant for over 6 years for Introduction to Biology and taught molecular biology laboratory sections for Animal Genetics 111 and Animal Nutrition 115.
- Completed six-week workshop series on “Student, Instructor, Classroom: Strategies for aligning teaching with learning” through UC Davis’ Center for Excellence in Teaching and Learning.