

# KRISTOPHER PARKER, PhD

*Curriculum Vitae*

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## EDUCATION / EXPERIENCE

August 2009 - May 2013.

\* Bachelor of Science in Biology. Pittsburg State University.

August 2013 - September 2018.

\* Doctor of Philosophy in Molecular & Cellular Life Science. University of Wyoming.

September 2018 - current.

\* Postdoctoral Scholar. Toxicology & Nutrition Laboratory. Colorado State University.

## TEACHING

*Pittsburg State University:*

- BIOL371/BIOL372: General Microbiology. Undergraduate Teaching Assistant. Fall 2012 / Spring 2013.
- BIOL571: Pathogenic Bacteriology. Undergraduate Teaching Assistant. Spring 2013.

*University of Wyoming:*

- MOLB1101: The Neanderthal & the Nucleus. Graduate Teaching Assistant. Fall 2015.
- MICR2021: General Microbiology. Distinguished Guest Lecturer on human and Earth microbiomes. Fall 2015 - Winter 2018. [6 semesters]
- MICR2021: General Microbiology. Graduate Teaching Assistant. Fall 2016 / Spring 2017.
- Summer Institute on Active Learning Fellow. Science Initiative's Learning Actively Mentoring Program (LAMP). Summer 2016 - Summer 2017.
- Instructor Certification. Data and Software Carpentries. Winter 2017.

*Colorado State University:*

- ERHS569: Immunotoxicology. Guest Lecturer on the human microbiome. Spring 2019.
- CVMBS Best Practices in Teaching Workshop. Participant. Summer 2019.
- CVMBS Inclusive Pedagogy Training Institute. Trainee. Fall 2019.
- Instructor. woRkshop: data visualization using the R programming language. Nov 2019.

*Front Range Community College (Larimer Campus):*

- BIO204 Microbiology with Lab. Instructor of Record: Section 601. Spring 2020.
- BIO204 Microbiology with Lab. Instructor of Record: Section 602. Spring 2020.

## MENTORSHIP

### *Undergraduate students:*

- \* Kyle Bochanski. Microbiology / Natural Resources. Dec 2014 - Jul 2015. [7 months]
- \* Reid Olson. Zoology. Aug 2015 - May 2016. [1 year]
- \* Bailey Hamann. Molecular Biology / Microbiology. Dec 2015 - Dec 2018. [3 years]
- \* Martha Wenger (MJ). Microbiology / Spanish. Feb 2017 - May 2018. [1 year]
- \* Marcus Manzanares. Biology / Molecular Biology. Sep 2017 - Sep 2018. [1 year]

### *Graduate student:*

- \* Melanie Beale (Mel). Health and Exercise Science. Jun 2019 - Oct 2019. [5 months]

### *Other:*

- \* Malachi Bustos. Big Brothers Big Sisters of Laramie. Jul 2014 - Mar 2018. [3.75 years]
- \* Guest mentor for 2017 / 2018 Summer Institute Fellows. Jul 2017. [1 month]
- \* Mentor for MICR2021 General Microbiology Undergraduate Teaching Assistants. Aug 2017 - May 2018. [2 semesters]

## SCIENCE COMMUNICATION AND OUTREACH

- **Presenter.** The human body as an ecosystem: expanding the definition of human health. Shepard Symposium on Social Justice. Rebel Health: Wellness Without Borders. University of Wyoming, Laramie, WY. April 6, 2017.
- **Presenter.** The Human Superorganism: A brief tour of our microbial world. Pre-Health Orientation. Pittsburg State University. Pittsburg, KS. October 10, 2017.
- **Presenter.** 2017: A Microbiome Odyssey - a tale of replication and reproducibility. National Science Olympiad National Tournament. Fort Collins, CO. May 18, 2018.
- **2019 / 2020 Sustainability Leadership Fellow.** School of Global Environmental Sustainability (SoGES). Colorado State University.
- **Panel Member.** The Experts Are In: CSU Sustainability Scientists; Ask Me Anything: about the human microbiome. School of Global Environmental Sustainability. Colorado State University. City of Fort Collins 20<sup>th</sup> Anniversary of Climate Action Celebration. November 14, 2019.

## SERVICE

### *University:*

- **Panel Member.** Graduate Teaching Assistant Workshop. Ellbogen Center for Teaching and Learning. University of Wyoming. Sep 2016.
- **Guest mentor.** Summer Institute on Active Learning 2017 / 2018 Fellows. Science Initiative's Learning Actively Mentoring Program. University of Wyoming. Jul 2017.
- **Mentor.** General Microbiology Undergraduate Teaching Assistants. University of Wyoming. Aug 2017 - May 2018.

- **Graduate Student Reviewer.** Wyoming INBRE Undergraduate Fellowship Proposals. University of Wyoming. Jan 2018 - Feb 2018.
- **Poster Judge.** 21<sup>st</sup> Annual College of Veterinary Medicine and Biomedical Sciences Research Day. Colorado State University. January 26, 2018.
- **Panel Member.** The Experts Are In: CSU Sustainability Scientists; Ask Me Anything: about the human microbiome. School of Global Environmental Sustainability. Colorado State University. City of Fort Collins 20<sup>th</sup> Anniversary of Climate Action Celebration. November 14, 2019.

#### *Community:*

- **Big Brother.** Big Brothers Big Sisters. Laramie, WY. Jul 2014 - Mar 2018.
- **Registration Coordinator.** 2016, 2017, and 2018 Gowdy Grinder Mountain Bike Race. Laramie Racing in conjunction with Pedal House Bicycle Shop. Laramie, WY.
- **Registration Coordinator.** 2016 and 2017 Laramie Mountain Bike Series. Laramie Racing.
- **Volunteer Coordinator.** 2017 Laramie Range Epic. Laramie Racing. May 2017 - Aug 2017.
- **State Competition Judge.** 2017 and 2018 Wyoming History Day. American Heritage Center. Laramie, WY.
- **Grand Awards Judge.** 64<sup>th</sup> Annual Colorado Science and Engineering Fair. Fort Collins, Colorado. Apr 2019.

## RESEARCH

#### *Undergraduate:*

Viral mechanisms for hijacking plant cytoskeletal machinery to facilitate cell-to-cell spread.  
Principal Investigator / Mentor: Dr. Phillip A. Harries.

#### *Graduate:*

Of mice and humans: Investigating intestinal microbiomes in the context of Hirschsprung-associated enterocolitis. Principal Investigator / Advisor / Mentor: Dr. Naomi L Ward.

#### *Postdoc:*

Exploring the intricate interplay between food components, metabolism, and gut microbes to promote gut health, prevent chronic disease, and reduce existing agricultural waste.  
Principal Investigator: Dr. Elizabeth P Ryan.

#### *Grants and funding:*

1. "Mining the mouse microbiome." Undergraduate: *Bailey Hamann*. Advisor: Naomi Ward. Mentor: **Kristopher Parker**. Wyoming EPSCoR Undergraduate Fellowship. First award: Jan. 2016-Jul. 2016. Amount: \$5,300. Second award: Aug 2016 - May 2017. Amount: \$5,000.
2. "Rebuilding the barrier to inflammation." Undergraduate: *Bailey Hamann*. Principal investigator: Naomi Ward. Mentor: **Kristopher Parker**. Wyoming NASA Space Grant Consortium, Undergraduate Fellowship. Jun 2017 - May 2018. Amount: \$2,500.
3. "Rice bran microbial metabolism for colon chemoprevention." Co-principal investigators: Elizabeth P Ryan and Komal Raina. Postdoc: **Kristopher Parker**. NIH Administrative Supplement (PA-18-817). Project number: 3R01CA201112-04SI. Amount: \$146,264.

## HONORS / AWARDS

- \* Dean's Scholastic Honors, Spring 2010; Spring 2011; Fall 2012. Pittsburg State University.
- \* Lowell Depp and Dorothy Crews-Eubank Scholarship. Fall 2012. Pittsburg State University.
- \* 2016 Big of the Year. Big Brothers Big Sisters of Laramie, Wyoming.
- \* 2016 / 2017 Summer Institute Teaching Fellow. LAMP. University of Wyoming.
- \* Peggy Cotter Travel Award. Summer 2019: American Society of Microbiology (ASM).
- \* 2019 / 2020 Sustainability Leadership Fellow. SoGES. Colorado State University.

## PUBLICATIONS

### *Published:*

1. **Parker, KD**, JP Gigley, NL Ward. 2016. Paths to GI research in the wild west: tales from Wyoming. *Cell Mol Gastroenterol Hepatol* 2(5):560-562.
2. **Parker, KD**, SE Albeke, JP Gigley, AM Goldstein, NL Ward. 2018. Microbiome composition in both wild-type and disease model mice is heavily influenced by mouse facility. *Front Microbiol*. doi: 10.3389/fmicb.2018.01598.
3. Nealon NJ\*, **KD Parker\***, P Lahaie, H Ibrahim, AK Maurya, K Raina, EP Ryan. 2019. *Bifidobacterium longum*-fermented rice bran and rice bran supplementation affects the gut microbiome and metabolome. *Beneficial Microbes*. doi: 10.3920/BM2019.0017.  
\*co-first authors

### *Accepted/In-press:*

1. Baxter, BA, **KD Parker**, MJ Nosler, S Rao, R Craig, C Seiler, EP Ryan. 2019. Metabolite profile comparisons between ascending and descending colon tissue in healthy adults. *World J Gastroenterol*.

### *In preparation:*

1. **Parker, KD**, M Westfal, NL Ward, AM Goldstein. 2020. Longitudinal characterization of fecal microbiota changes in patients with Hirschsprung-associated enterocolitis. *Neurogastroenterol Motil*.
2. **Parker, KD**, AK Maurya, MN Beale, H Ibrahim, S Rao, R Kant, R Agarwal, K Raina, EP Ryan. 2020. Rice bran diet modified stool microbial communities from colorectal cancer survivors confer protection from inflammation-induced colon carcinogenesis in transfaunated mice. Target: *Cancer Discovery*.
3. K Raina, **Parker, KD**, AK Maurya, H Ramseier, R Kant, H Ibrahim, B Raina, R Agarwal, EP Ryan. 2020. Microbe-dependent metabolism of rice bran elicits protection from colon carcinogenesis in conventional and germ-free murine models. Target: *Cancer Cell*.
4. **Parker, KD**, AK Maurya, H Ramseier, NJ Nealon, H Ibrahim, S Rao, R Kant, R Agarwal, K Raina, EP Ryan. 2020. Murine fecal microbiota colonization dynamics following dietary rice bran intake. Target: *mSystems*.
5. Beale, MN, HJ Leach, **Parker, KD**, BA Baxter, HV Smith, EP Ryan. 2020. Relationships between objectively measured physical activity and stool metabolome and microbiome composition in individuals at high risk for colorectal cancer. Target: *J Phys Act Health*.
6. **Parker, KD**, LC Cheng, AM Goldstein, NL Ward. 2020. A multi-facility comparison of fecal microbiota transplantation after antibiotic depletion of native gut microbiota in conventionally raised healthy mice. Target: *PLOS One*.

## PRESENTATIONS

### *Invited seminars:*

1. **Parker, KD**, SE Albeke, AM Goldstein, NL Ward\*. The role of gastrointestinal microbiota in Hirschsprung-associated enterocolitis and the challenges of replication. National Science Foundation Symposium on Sensing and Computational Biology. Colorado State University, Fort Collins, CO, USA. June 12-13, 2017.
2. \***Parker, KD**, Diet, cancer, and the microbiome. 70<sup>th</sup> American Association for Laboratory Animal Science (AALAS) National Meeting. Denver, CO, USA. October 13-17, 2019.

### *Oral presentations:*

1. \*Hamann, B.J., **KD Parker**, NL Ward. Mining the mouse microbiome. 1<sup>st</sup> Annual Wyoming INBRE Conference: Wyoming Undergraduate Research Day. University of Wyoming, Laramie, WY, USA. April 29-30, 2016.
2. \*Hamann, B.J., **KD Parker**, NL Ward. Mining the mouse microbiome. 2<sup>nd</sup> Annual Wyoming INBRE Conference: Wyoming Undergraduate Research Day. University of Wyoming, Laramie, WY, USA. April 28-29, 2017.
3. \***Parker, KD**, SE Albeke, JP Gigley, AM Goldstein, NL Ward. Microbiome composition in both wild-type and disease model mice is heavily influenced by mouse facility. American Society for Microbiology Tri-Branch Conference. Durango, CO, USA. April 6-7, 2018.
4. \***Parker, KD**, H Ramseier, AK Maurya, NJ Nealon, R Kant, H Ibrahim, B Raina, R Agarwal, K Raina, EP Ryan. Fermenting agricultural waste with a probiotic: a mouse gut-centered journey. CSU Microbiome Seminar Series. Fort Collins, CO, USA. February 20, 2019.

### *Poster presentations - undergraduate:*

1. \*Woodruff, R., K Nickell\*, **KD Parker\***, P Conley, PA Harries. The effect of calreticulin knockout on plasmodesmatal gating in *Physcomitrella patens*. 11<sup>th</sup> Annual K-INBRE Symposium. Kansas State University, Manhattan, KS, USA. January 2013.

### *Poster presentations - graduate:*

1. \***Parker, KD**, P LaBreck, AM Goldstein, AR Horwille, NL Ward. Unusually abundant coagulase-negative staphylococci in the GI tract of endothelin receptor B-null mice. 16<sup>th</sup> International Symposium on Staphylococci and Staphylococcal Infections (ISSSI). Chicago, IL, USA. August 2014.
2. \***Parker, KD**, K Bochanski, JP Gigley, AM Goldstein, NL Ward. The role of GI microbiota in Hirschsprung-associated enterocolitis. American Society for Microbiology Tri-Branch Conference. Fort Lewis College, Durango, CO, USA. April 24-25, 2015.
3. \***Parker, KD**, K Bochanski, JP Gigley, AM Goldstein, NL Ward. The challenges of reproducibility in mouse microbiomes. American Society for Microbiology Rocky Mountain Regional Branch Meeting. Denver, CO, USA. November 2016.
4. \***Parker, KD**, SE Albeke, AM Goldstein, NL Ward. The role of GI microbiota in Hirschsprung-associated enterocolitis and the challenges of replication. Keystone Symposium: Microbiome in Health and Disease. Keystone, CO, USA. February 5-9, 2017.
5. \***Parker, KD**, SE Albeke, AM Goldstein, NL Ward. The role of GI microbiota in Hirschsprung-associated enterocolitis and the challenges of replication. Microbiomics Symposium. Santa Fe, NM, USA. March 16-17, 2017.
6. \*Hamann, B.J., **KD Parker**, NL Ward. Mining the mouse microbiome. 2<sup>nd</sup> Annual Wyoming INBRE Conference. University of Wyoming, Laramie, WY, USA. April 28-29, 2017.
7. \*Hamann, B.J., **KD Parker**, NL Ward. Rebuilding the barrier to inflammation. NIH IDeA Western Regional Conference. Jackson, WY, USA. October 18-20, 2017.

8. \***Parker, KD**, SE Albeke, JP Gigley, AM Goldstein, NL Ward. Assessing multi-facility reproducibility in mouse microbiomes. NIH IDEa Western Regional Conference. Jackson, WY, USA. October 18-20, 2017.
9. \***Parker, KD**, SE Albeke, JP Gigley, AM Goldstein, NL Ward. Microbiome composition in both wild-type and disease model mice is heavily influenced by mouse facility. Keystone Symposium: Microbiome Host Resistance and Disease. Banff, AB, Canada. March 4-8, 2018.

*Poster presentations - postdoc:*

1. \***Parker, KD**, H Ramseier, AK Maurya, NJ Nealon, R Kant, H Ibrahim, B Raina, P Lahaie, R Agarwal, K Raina, EP Ryan. Fermentation of rice bran with the probiotic *Bifidobacterium longum* modifies gut microbiota composition and metabolite profile for protection against colon carcinogenesis. University of Colorado Cancer Center - Molecular and Cellular Oncology Retreat. Boulder, CO, USA. March 4, 2019.
2. \***Parker, KD**, H Ramseier, AK Maurya, NJ Nealon, R Kant, H Ibrahim, B Raina, P Lahaie, R Agarwal, K Raina, EP Ryan. Fermentation of rice bran with the probiotic *Bifidobacterium longum* modifies gut microbiota composition and metabolite profile for protection against colon carcinogenesis. University of Colorado Anschutz – Cancer Control and Prevention Retreat. Denver, CO, USA. March 26, 2019.
3. \***Parker, KD**, H Ramseier, AK Maurya, NJ Nealon, R Kant, H Ibrahim, B Raina, P Lahaie, R Agarwal, K Raina, EP Ryan. Fermentation of rice bran with the probiotic *Bifidobacterium longum* modifies gut microbiota composition and metabolite profile for protection against colon carcinogenesis. 1<sup>st</sup> Annual Front Range Microbiome Symposium. Colorado State University. Fort Collins, CO, USA. April 18-19, 2019.
4. \*Nealon, NJ, **Parker, KD**, P Lahaie, H Ibrahim, AK Maurya, K Raina, EP Ryan. Host and gut microbial metabolism of *Bifidobacterium longum*-fermented rice bran in healthy mice and bioavailability of colorectal cancer-protective compounds. 1<sup>st</sup> Annual Front Range Microbiome Symposium. Colorado State University. Fort Collins, CO, USA. April 18-19, 2019.
5. \***Parker, KD**, H Ramseier, AK Maurya, NJ Nealon, R Kant, H Ibrahim, B Raina, P Lahaie, R Agarwal, K Raina, EP Ryan. Rice Bran and *Bifidobacterium longum*-fermented Rice Bran Modulate Gut Microbial Metabolism to Increase Bioavailability of Health Promoting Metabolites. American Society for Microbiology: Microbe 2019 Conference. San Francisco, CA, USA. April 18-19, 2019. June 20-24, 2019.
6. \***Parker, KD**, NJ Nealon, AK Maurya, H Ramseier, H Ibrahim, R Kant, B Raina, P Lahaie, R Agarwal, K Raina, EP Ryan. Rice bran and *Bifidobacterium longum*-fermented rice bran modulate gut microbial metabolism to increase bioavailability of health promoting metabolites. 7<sup>th</sup> Annual CCTSI Summit on AI and Machine Learning in Biomedical Research. Denver, CO, USA. August 14, 2019.
7. \*Baxter, BA, **KD Parker**, MJ Nosler, S Rao, R Craig, C Seiler, EP Ryan. Ascending and descending colon tissue metabolite analysis reveals differences between normal, overweight, and obese adults with relevance to colon cancer risk. 7<sup>th</sup> Annual CCTSI Summit on AI and Machine Learning in Biomedical Research. Denver, CO, USA. August 14, 2019.
8. \***Parker, KD**, AK Maurya, MN Beale, H Ibrahim, S Rao, R Kant, R Agarwal, K Raina, EP Ryan. Rice bran modified microbial consortia from a colorectal cancer survivor confers protection from inflammation-associated colon carcinogenesis in a murine model. 4<sup>th</sup> Annual Cancer Center Retreat. University of Colorado Anschutz. Denver, CO, USA. November 5, 2019.
9. \***Parker, KD**, AK Maurya, MN Beale, H Ibrahim, S Rao, R Kant, R Agarwal, K Raina, EP Ryan. Rice bran modified microbial consortia from a colorectal cancer survivor confers protection from inflammation-associated colon carcinogenesis in a murine model. iBRIGHT 2019 Conference. Houston, TX, USA, November 11-13, 2019.