Bryan P. Brown, PhD

Assistant Professor
Department of Molecular, Cell and Systems Biology, University of California Riverside
Director, UCR Microbiome Initiative
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EDUCATION

2017 Doctor of Philosophy, Duke University, Durham, NC
Center for Genomic and Computational Biology; Nicholas School of the Environment
Dissertation: *Ecological and Evolutionary Factors Shaping Animal-Bacterial Symbioses: Insights from Insects & Gut Symbionts*
Advisor: Jennifer J. Wernegreen, PhD

2011 Bachelor of Science, The University of Akron, Akron, OH
Majors: Biochemistry, Biology; Minor: Spanish
Advisors: Stephen C. Weeks, PhD and John M. Senko, PhD

RESEARCH EXPERIENCE

2024 – Present **Assistant Professor, University of California Riverside**
Department of Molecular, Cell and Systems Biology, Riverside, CA

2022 – 2024 **Acting Assistant Professor, University of Washington**
University of Washington School of Medicine, Department of Pediatrics, Division of Infectious Disease, Seattle, WA

2017 - 2022 **Research Scientist III/ Postdoctoral Fellow, Seattle Children's**
Seattle Children's Research Institute, Center for Global Infectious Disease Research, Seattle, WA (PIs: Heather Jaspan, MD, PhD; Rhea Coler, PhD)

2016 – 2023 **Visiting Researcher, University of Cape Town**
Institute of Infectious Disease & Molecular Medicine, Cape Town, South Africa

2012 - 2017 **Predoctoral Fellow, Duke University**
Nicholas School of the Environment, Durham, NC (PI: Jennifer Wernegreen, PhD)

2009 – 2011 **Research Assistant, The University of Akron**
Department of Biology, Akron, OH

2010 – 2011 **Research Assistant, The University of Akron**
Department of Geosciences, Akron, OH

AWARDS AND HONORS

2021 – 2027 Pathway to Independence Award, Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institutes of Health, Department of Health and Human Services

2021 – 2022 Loan Repayment Program Renewal Award, Pediatric Research, National Institute of Allergy and Infectious Disease, National Institutes of Health, Department of Health and Human Services

2020 Research Scholarship, 4th HIV Research for Prevention Conference (HIVR4P), International AIDS Society

2020 - 2021	Ruth L. Kirschstein National Research Service Award Individual Postdoctoral Fellowship, Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institutes of Health, Department of Health and Human Services
2019	New Investigator Scholarship, 2020 Conference on Retroviruses and Opportunistic Infections (CROI), International Antiviral Society-USA
2019 - 2021	Loan Repayment Program, Pediatric Research, National Institute of Allergy and Infectious Disease, National Institutes of Health, Department of Health and Human Services
2019	International Scholarship, 10th International AIDS Society Conference on HIV Science, International AIDS Society
2018	Travel award, 4th International Workshop on Microbiome in HIV, National Institutes of Allergy and Infectious Diseases, National Institutes of Health
2015 - 2016	Graduate Research Opportunities Worldwide Travel Award, National Science Foundation
2013 - 2016	Graduate Research Fellowship, National Science Foundation
2011	Undergraduate Researcher of the Year, The University of Akron
2011	Outstanding Undergraduate Research Award, The University of Akron
2011	Dr. Paul Acquarone Award in Plant Sciences, The University of Akron
2010	Placed 1st overall, Conference on Integrated Bioscience, The University of Akron
2007 - 2008	Honors Recognition Scholarship, The University of Akron
2007 - 2008	Presidential Scholarship, The University of Akron

RESEARCH FUNDING

Current funding

R21HD114512 ($137,500 annual DC) 9/14/2024 – 8/31/2026
Eunice Kennedy Shriver National Institute of Child Health and Human Development
National Institutes of Health
PI: Brown
NIH Exploratory/Developmental Research Grant
Title: Viral determinants of Bacterial Vaginosis and HIV acquisition risk in the female genital tract
Description: This project utilizes integrative metagenomics to characterize the interplay between vaginal viral and bacterial communities, how they interact to drive dysbioses, and how these dynamics may alter HIV acquisition risk. Role: Principal Investigator

R00HD106861 ($250,000 annual DC) 09/17/2024 – 8/31/2027
Eunice Kennedy Shriver National Institute of Child Health and Human Development
National Institutes of Health
PI: Brown
NIH Pathway to Independence Award
Title: Identifying inter-kingdom microbial determinants of altered immunity in HIV exposed infants
Description: The project utilizes integrative multiomic techniques and gnotobiotic mouse models to characterize the effects of the expanded gut virome of HIV-exposed infants on their bacterial microbiota and responses to vaccination. Role: Principal Investigator

Completed research funding

K99HD106861 ($100,000 annual DC) 9/1/2021 – 8/31/2023
Eunice Kennedy Shriver National Institute of Child Health and Human Development
National Institutes of Health

PI: Brown
NIH Pathway to Independence Award
Title: Identifying inter-kingdom microbial determinants of altered immunity in HIV exposed infants
Description: The project utilizes integrative multiomic techniques and gnotobiotic mouse models to characterize the effects of the expanded gut virome of HIV-exposed infants on their bacterial microbiota and responses to vaccination. Role: Principal Investigator

L40AI147257 ($20,000 annual DC) 7/1/2019 – 6/30/2022
National Institute of Allergy and Infectious Diseases
National Institutes of Health
PI: Brown
NIH Extramural Loan Repayment Program for Pediatric Research
Title: Influence of gut virome on bacterial microbiota and vaccine responsiveness in HIV-exposed infants
Description: The project aims to characterize the effects of maternal HIV infection on infant endogenous microbial communities and their responses to vaccination. Role: Principal Investigator

F32HD102290 ($70,000 annual DC) 4/1/2020 – 3/31/2023
Eunice Kennedy Shriver National Institute of Child Health and Human Development
National Institutes of Health
PI: Brown
NIH Ruth L. Kirschstein National Research Service Award Individual Postdoctoral Fellowship
Title: Influence of gut virome on bacterial microbiota and vaccine responsiveness in HIV-exposed infants
Description: The project aims to characterize the effects of maternal HIV infection on infant endogenous microbial communities and their responses to vaccination. Role: Principal Investigator

NSF1106401 ($40,000 annual DC) 9/1/2013 – 8/31/2016
National Science Foundation
PI: Brown
NSF Graduate Research Fellowship
Title: Ecological and evolutionary forces shaping animal-bacterial interactions
Description: The project aims to identify mechanisms underlying genomic adaptation of bacterial mutualists living inside of animal hosts. Role: Principal Investigator

NSF1106401 ($20,000 annual DC) 8/1/2015 – 7/31/2016
National Science Foundation, United States Agency for International Development
PI: Brown
NSF Graduate Research Opportunities Worldwide, and USAID Research and Innovation Fellowship
Title: Structural and functional dynamics of vaginal microbiota associated with altered HIV susceptibility
Description: The goal of this study is to identify shifts in vaginal bacterial microbiota that are associated with elevated HIV susceptibility in adolescent South African women. Role: Principal Investigator

DUSOM1075 ($10,000 annual DC) 2/1/2016 – 1/31/2017
Duke University
PI: Wernegreen
Research Grant, Duke University School of Medicine
Title: A world within: Diversity and dynamics of bacterial communities inhabiting ants
Description: The purpose of this study is to identify mechanisms and dynamics of bacterial transmission between interacting hosts and across developmental stages. Role: Co-Investigator

DUNSOE0789 ($10,000 annual DC) 1/1/2016 – 4/30/2017
Duke University
PI: Wernegreen
SEED grant, Duke University Nicholas School of the Environment
Title: Evolutionary dynamics across the genomes of persistent gut bacterial associates
Description: This project aims to characterize the genomes of persistent gut bacteria and to identify selective pressures acting on these associates via adaptation to the gastrointestinal tract. Role: Co-Investigator.

BIBLIOGRAPHY

Peer-Reviewed Publications

23. Byrne A, Diener C, Brown BP, Maust BS, Feng C, Alinde BL, Gibbons SM, Koch M, Gray CM, Jaspan HB, Nyangahu DD. Neonates exposed to HIV but uninfected exhibit an altered gut microbiota and inflammation associated with impaired breast milk antibody function. **Microbiome**. 2024 Dec 20;12(1):261. doi: 10.1186/s40168-024-01973-z. PMID: 39707483; PMCID: PMC11662858.

22. Nyangahu DD, Happel AU, Wendoh J, Kiravu A, Wang Y, Feng C, Plumlee C, Cohen S, Brown BP, Djukovic D, Ganief T, Gasper M, Raftery D, Blackburn JM, Allbritton NL, Gray CM, Paik J, Urdahl KB, Jaspan HB. Bifidobacterium infantis associates with T cell immunity in human infants and is sufficient to enhance antigen-specific T cells in mice. **Sci Adv.** 2023 Dec 8;9(49):eade1370. doi: 10.1126/sciadv.ade1370. PMID38064556

21. Maust BS, Petkov S, Herrera C, Feng C, Brown BP, Lebina L, Opoka D, Ssemata A, Pillay N, Serwanga J, Seatlholo P, et al. Bacterial microbiome and host inflammatory gene expression in foreskin tissue. **Heliyon.** 2023 Nov 14. PMID38053902

20. Gupta PM, Balle C, Tharp GK, Nelson SA, Gasper MA, Brown BP, Alisoltani A, Onono M, Palanee-Phillips T, Nair G, Ayele H, Noel-Romas L, Passmore JS, Burgener AD, Heffron R, Jaspan HB, Bosinger SE. Systems analysis reveals differential expression of endocervical genes in African women randomized to DMPA-IM, LNG implant or cu-IUD. **Clin Immunol**. 2023 Sep 3;255:109750. doi: 10.1016/j.clim.2023.109750 PMID37660744.

19. Brown BP, Feng C, Tanko RF, Jaumdally SZ, Bunjun R, Dabee S, Happel AU, Gasper M, Nyangahu DD, Onono M, Nair G, Palanee-Phillips T, Scoville CW, Heller K, Baeten JM, Bosinger SE, Burgener A, Passmore JS, Heffron R, Jaspan HB. Copper intrauterine device increases vaginal concentrations of inflammatory anaerobes and depletes lactobacilli compared to hormonal options in a randomized trial. **Nat Commun**. 2023 Jan 30;14(1):499. doi: 10.1038/s41467-023-36002-4. PMID36717556

18. Happel AU, Balle C, Havyarimana E, Brown BP, Maust BS, Feng C, Yi BH, Gill K, Bekker LG, Passmore JA, Jaspan HB. Cervicovaginal Human Papillomavirus Genomes, Microbiota Composition and Cytokine Concentrations in South African Adolescents. **Viruses**. 2023 Mar 15;15(3):758. PMID36992467

17. Jimoh AO, Balle C, Brown BP, Feng C, Havyarimana E, Konstantinus IN, Gill K, Bekker LG, Passmore JS, Jaspan HB, Varsani A, Happel AU. Genome Sequences of Anelloviruses, a Genomovirus, Microviruses, Polyomaviruses, and an Unclassified Caudovirus Identified in Vaginal Secretions from South African Adolescents. **Microbiol Resour Announc**. 2023 Jan 24;12(1):e0114322. doi: 10.1128/mra.01143-22. Epub 2022 Dec 19. PMID36533922

16. Nyangahu DD, Courtney P, Brown BP, Feng C, Havyarimana E, Cohen S, Urdahl K, Jaspan HB. Antibiotic treatment during gestation enhances susceptibility to Mycobacterium tuberculosis in infant mice. **Microbiol Spectr.** 2022 Oct 31:e0249122. doi: 10.1128/spectrum.02491-22. PMID36314979.

15. Baldwin SL, Reese VA, Larsen SE, Pecor T, Brown BP, Granger B, Podell BK, Fox CB, Reed SG, Coler RN. Therapeutic efficacy against Mycobacterium tuberculosis using ID93 and liposomal adjuvant formulations. **Frontiers in Microbiology**. 2022:3063. PMID36090093

14. Bunjun R, Tanko RF, Jaumdally SZ, Noel-Romas L, Ayele H, Brown BP, Gamieldien H, Harryparsad R, Nair G, Onono M, Palanee-Philips T, Scoville C, Heller KB, Baeten JM, Bosinger SE, Burgener A, Passmore JS, Jaspan HB, Heffron R. Initiating intramuscular depot medroxyprogesterone acetate (DMPA-IM) increases frequencies of Th17-like HIV target cells in the genital tract of women in South Africa: a randomised trial. **Clin Infect Dis**. 2022 Aug 9. PMID35941737

13. Dabee S, Tanko RF, Brown BP, Bunjun R, Balle C, Feng, C, Konstantinus I, Jaumdally SZ, Onono M, Nair G, Palanee-Phillips T, Gill K, Baeten JM, Bekker LG, Passmore JS, Heffron R, Jaspan HB, Happel A. Comparison of Female Genital Tract Cytokine and Microbiota Signatures Induced by Initiation of Intramuscular DMPA and NET-EN Hormonal Contraceptives-a Prospective Cohort Analysis. **Frontiers in Immunology**. 2021: 5296. PMID34956191

12. Larsen S, Berube B, Pecor T, Cross E, Brown BP, Williams B, Johnson E, Qu P, Baldwin SL, Coler RN. Qualification of ELISA and neutralization methodologies to measure SARS-CoV-2 humoral immunity in human clinical samples. **Journal of immunological methods** 2021 Dec 1;499:113160. PMID34599915

11. Brown BP, Wendoh J, Chopera D, Havyarimana E, Jaumdally S, Nyangahu DD, Gray CM, Martin DP, Varsani A, Jaspan HB. crAssphage genomes identified in fecal samples of an adult and infants with evidence of positive genomic selective pressure within tail protein genes. **Virus Res**. 2020 Oct 30;198219. PMID33137401

10. Nyangahu DD, Darby M, Havyarimana E, Brown BP, Horsnell W, Jaspan HB. Preconception helminth infection alters offspring microbiota and immune subsets in a mouse model. **Parasite Immunology**. 2020 Apr 11:e12721. PMID32277499

9. Brown BP, Jaspan HB. Compositional analyses reveal correlations between taxon-level gut bacterial abundance and peripheral T cell marker expression in African infants. **Gut microbes.** 2019 Jul 28:1-8. PMID31347944

8. Brown BP, Wernegreen JJ. Genomic erosion and extensive horizontal gene transfer in gut-associated Acetobacteraceae. **BMC genomics**. 2019 Dec;20(1):472. PMID31182035.

7. Wood LF*, Brown BP*, Lennard K, Karaoz U, Passmore JS, Hesseling AC, Edlefson PT, Mulder N, Brodie EL, Sodora DL, Jaspan HB. Feeding related gut microbial composition associates with peripheral T cell activation and mucosal gene expression in African infants. **Clin Infect Dis** 2018 Sep 28;67(8):1237-1246. PMID29659737. ***co-first authors**.

6. Nyangahu D, Lennard KS, Brown BP, Darby MG, Wendoh JM, Havyarimana H, Smith P, Butcher J, Stintzi A, Mulder N, Horsnell W, Jaspan HB. Disruption of maternal gut microbiota during gestation alters offspring immunity. **Microbiome** 2018 Jul 7;6(1):124. PMID29981583. PMC6035804.

5. Ho NT, Li F, Lee-Sarwar KA, Tun HM, Brown BP, Pannaraj PS, Bender JM, Azad MB, Thompson AL, Weiss ST, Azcarate-Peril MA, Litonjua AA, Kozyrskyj AL, Jaspan HB, Aldrovandi GM, Kuhn L. Meta-analysis of effects of exclusive breastfeeding on infant gut microbiota across populations. **Nat Commun** 2018 Oct 9;9(1):4169. PMID30301893. PMC6177445.

4. Brown BP and Wernegreen JJ. Deep divergence and rapid evolutionary rates in gut-associated Acetobacteraceae of ants. **BMC Microbiol** 2016 Jul 11;16(1):140. PMID27400652. PMC4939635.

3. Brown BP, Astrop TI, Weeks SC. Post-larval developmental dynamics of the Spinicaudatan (Branchiopoda: Diplostraca) carapace. **Journal of Crustacean Biology** 2014 34 (5), 611-617.

2. Astrop, TI, Park, LE, Brown BP, and Weeks, SC. Sexual discrimination at work: Spinicaudatan 'Clam Shrimp' (Crustacea: Branchiopoda) as a model organism for the study of sexual system evolution. **Palaeontologia Electronica** 2012 Vol. 15, Issue 2;20A,15p.

1. Brown BP, Brown SR and Senko JM. Microbial communities associated with wet flue gas desulfurization systems. **Front Microbiol** 2012 3:412. PMID23226147. PMC3510643.

Invited presentations

5. Brown BP, Maust BM, Feng C, Happel AU, Minot S, Varsani A, Jaspan HB. (2025, March). Inter-kingdom microbial determinants of altered immunity in African women and infants. **Integrated Bioscience Seminar Series**, University of Akron, Akron, OH

4. Brown BP, Feng C, Tanko RF, Jaumdally SZ, Bunjun R, Dabee S, Heffron, RH, Jaspan HB. (2023, March). Contraceptive induced alterations to the cervicovaginal environment: insights from the ECHO Trial. **Institute of Infectious Disease and Molecular Medicine Seminar Series**, University of Cape Town. Cape Town, South Africa

3. Brown BP, Feng C, Maust BM, Happel AU, Varsani A, Jaspan HB. (2023, March). Defining the Vaginal Virome. **Vaginal Microbiome Research Consortium 2023 Annual Meeting**. Durban, South Africa

2. Brown BP, Maust BM, Happel AU, Havyarimana E, Jaumdally SZ, Varsani A, Coler, RN, Jaspan HB. (2022, November). Inter-kingdom microbial determinants of altered immunity in HIV-exposed infants. **7th International Conference on Vaccines Research and Development**. Boston, MA, USA.

1. Brown BP, Maust BM, Happel AU, Havyarimana E, Jaumdally SZ, Varsani A, Jaspan HB. (2022, April). Multi-omic insights into endogenous microbiota and immunity in African women and infants. **Pacific Northwest Research Institute Seminar Series**, Seattle, WA, USA.

Platform presentations

5. Brown BP, Maust BM, Feng C, Happel AU, Minot S, Varsani A, Jaspan HB. (2024, July). HIV infection alters the breastmilk virome of mothers living with HIV and the gut virome of related infants through early life. **25th International AIDS Conference**, Munich Germany.

4. Brown BP, Wendoh J, Chopera D, Havyarimana E, Jaumdally SZ, Martin DP, Varsani A, Jaspan HB. (2019, July). Maternal HIV infection alters the community composition and dynamics of the enteric microbiome of associated infants. **10th International AIDS Society Conference on HIV Science**, Mexico City, Mexico.

3. Balle C, Lennard K, Konstantinus I, Jaumdally S, Esra R, Gasper M, Brown BP, Karaoz U, Gill K, Myer L. (2018, October). Hormonal Contraception Induced Changes to the Female Genital Microbiota in South African Adolescents: A Randomized, Crossover Trial. **HIV Research for Prevention**. Madrid, Spain.

2. Brown BP, Jaspan HB, Study Team I. (2018, October). A compositional transform reveals HIV exposure induced shifts in the fecal microbiota and vaccine responsiveness of Nigerian infants. **4th International Workshop on Microbiome in HIV Pathogenesis, Prevention and Treatment.** Washington, DC, USA.

1. Brown BP, Jaspan HB. (2018, September). A penalized compositional transform reveals shifts in the fecal microbiota of HIV exposed Nigerian infants. **Fred Hutchinson Microbiome Research Initiative Biennial Symposium**. Seattle, WA, USA.

Poster presentations

7. Brown BP, et al. (2021, January). HIV exposure alters the fecal microbiome in Nigerian infants. **4th HIV Research for Prevention Conference (HIVR4P)**. Virtual.

6. Brown BP, et al. (2020, March). Contraceptive use induces durable shifts in the female genital-tract microbiota. **2020 Conference on Retroviruses and Opportunistic Infections (CROI).** Boston, MA, USA.

5. Brown BP, Jaspan HB. (2018, October). A compositional transform reveals HIV exposure induced shifts in the fecal microbiota and vaccine responsiveness in Nigerian infants. **3rd HIV Research for Prevention**. Madrid, Spain.

4. Brown BP, Varsani A, Jaspan HB. (2018, October). Altered composition and elevated diversity in the enteric virome of HIV exposed uninfected South African infants. **3rd HIV Research for Prevention**. Madrid, Spain.

3. Brown BP, Jaspan HB, Study Team I. (2018, April). HIV exposure alters the fecal microbiome and efficacy of oral polio vaccine in Nigerian infants. **25th International HIV Dynamics & Evolution.** Leavenworth, WA, USA.

2. Brown BP, Senko J. (2012, June). Microbial Communities Associated With Flue Gas Desulfurization Systems. **American Society for Microbiology: 112th General Meeting**. San Francisco, CA, USA.

1. Brown BP, Weeks S. (2011, June). Morphometrics and Ontogenetics: Evolutionary Dynamics of the Spinicaudatan 'Clam Shrimp'. **The Evolution Conference**. Norman, OK, USA.

TEACHING AND MENTORING

Courses taught

Biol119: Introduction to Genomics and Bioinformatics
University of California Riverside
Role: Instructor
Description: This upper-level undergraduate course focuses on contemporary topics in genomics, metagenomics, and single-cell approaches, with applications to the human microbiome.

Mentoring

Advising: Research
Current:
2 PhD students; 1 MS student:
1. Mia Miyatake, Microbiology PhD student, University of California, Riverside
2. Tejsi Dhameliya, CMDB PhD student, University of California, Riverside
3. Angela De Guzman, Microbiology MS student, University of California, Riverside
4. Annabelle Lu, CMDB Undergraduate student, University of California, Riverside

Past:
5 undergraduate researchers; Representative trainees:
1. Carlton Adams, Undergraduate trainee, Duke University; Currently, PhD Candidate, The Feinberg School of Medicine, Northwestern University
2. Eric Song, Undergraduate trainee, Duke University; Currently, Software Development Manager, Amazon Web Services
3. Aubrey Brown, Undergraduate trainee, Seattle Children's; Currently, Medical student, School of Medicine, University of Washington
4. Adijat Jimoh, PhD student, University of Cape Town

OTHER

Editorial boards

Review Editor, HIV and STIs section, *Frontiers in Reproductive Health*

Reviewing activities

Journals:
Clinical and Translational Medicine
Gut Microbes
Microbiology Spectrum
Microbiome
mSystems
PLOS ONE
Symbiosis

Funding Agencies:
Mucosal Immunology Studies Team (MIST), ZRG1 KUDS-M(55), National Institutes of Health, March 2026
Human Virome Program Special Emphasis Panel, National Institutes of Health, July 2025
Pediatric HIV/AIDS Cohort Study (PHACS), ZHD1 DSR-H (55), National Institutes of Health, April 2025
Common Fund Human Virome Program, ZRG1-IIDA-E (50) R, National Institutes of Health, May 2024
Population-based Research in Infectious Disease (PRID) Study Section, National Institutes of Health, October 2023

R packages developed

pico: a suite of compositional data analysis functions targeted for marker gene (16S/18S/ITS) and metagenomic microbiome datasets, including a novel transformation that couples an L1 penalized matrix decomposition to the isometric log ratio transformation.

microfiltR: identifies and corrects for multiple sources of contamination (exogenous and cross) in compositional marker gene surveys. Available at https://github.com/itsmisterbrown/microfiltR