

Elizabeth Lauren Johnson, Ph.D.

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EDUCATION

Princeton University Ph.D. Molecular Biology	(Jan 2014)
Spelman College B.S. Biology, Magna Cum Laude	(May 2008)

EXPERIENCE

Assistant Professor Division of Nutritional Sciences, Cornell University	(2018 – present)
Postdoctoral Research Associate Department of Molecular Biology, Cornell University	(2014 – 2018)
Visiting Researcher Institute of Human Nutrition, Columbia University	(2014 – 2018)

HONORS AND AWARDS

Schwartz Fund Visionary Award	(2023)
HHMI Freeman Hrabowski Scholar	(2023)
Pew Biomedical Scholar	(2022)
NIH NIGMS Judith H. Greenberg Early-Career Investigator Lecturer	(2021)
CIFAR Azrieli Global Scholar	(2021)
NIH NIGMS Early-Stage Investigator Maximizing Investigators' Research Award	(2020)
Cell Mentor 1000 Inspiring Black Scientists in America	(2020)
Princeton University Patrice Y. Johnson Memorial Service Award	(2014)
National Science Foundation Graduate Research Fellowship	(2009 – 2014)
Princeton University Department of Molecular Biology Teaching Award	(2012)
Phi Beta Kappa	(2008)
Spelman College Departmental Honors	(2008)

PUBLICATIONS (*These authors contributed equally, †corresponding author, Johnson Lab members underlined)

Publications from Independent Research Program (published commentaries on our work also noted)

1. Sibinga NA, Lee MT, Buchon N, **Johnson EL**[†], Selvaraj V, Marquis H. Do antimicrobial peptide levels alter performance of insect-based aquaculture feeds - a study using genetic models of insect immune activation. *Journal of Insects as Food and Feed* (2023) 9, (7) 919 – 937.
2. Le HH^{*}, Lee MT^{*}, Besler K, Comrie JMC, **Johnson EL**[†]. Characterization of the interaction of dietary cholesterol with the murine and human gut microbiome. *Nature Microbiology* (2022) 7, 1390 - 1403.
 - a. *Nature News & Reviews*: <https://www.nature.com/articles/s41564-022-01186-w>
 - b. *Cornell Chronicle*: <https://news.cornell.edu/stories/2022/08/study-identifies-gut-bacteria-regulate-cholesterol>
3. Le HH^{*}, Lee MT^{*}, Besler K, **Johnson EL**[†]. Host hepatic metabolism is modulated by gut microbiome derived sphingolipids. *Cell Host & Microbe* (2022) 30, 798 – 808 e797.

- a. *CH&M Preview*: <https://www.sciencedirect.com/science/article/pii/S1931312822002682?via%3Dihub>
 - b. *Nature Reviews Research Highlight*: <https://www.nature.com/articles/s41575-022-00646-2>
 - c. *Science Signaling Highlight*: <https://www.science.org/doi/full/10.1126/scisignal.add6194>
 - d. *Cornell Chronicle*: <https://news.cornell.edu/stories/2022/07/gut-molecules-may-affect-fattiness-liver>
4. Heaver SL, Le HH, Teng P, Baslé A, Mirretta Barone C, Vu D, Waters J, Marles-Wright J, **Johnson EL**, Campopiano DJ, Ley RE. Characterization of inositol lipid metabolism in gut-associated Bacteroidetes. *Nature Microbiology* (2022) 7, 986 - 1000.
 5. Lee MT^{*}, Le HH^{*}, Besler K^{*}, **Johnson EL**[†]. Identification and characterization of 3-ketosphinganine reductase activity encoded at the *BT_0972* locus in *Bacteroides thetaiotaomicron*. *Journal of Lipid Research* (2022) 63, 100236.
 6. Sibinga NA, Lee MT, **Johnson EL**, Selvaraj V, Marquis H. Longitudinal sampling of the rainbow trout (*Oncorhynchus mykiss*) microbiome reveals effects of dietary ceropin A and *Yersinia ruckeri* infection. *Frontiers in Marine Science* (2022) 9.
 7. Lee MT, Le HH, and **Johnson EL**[†]. A BOSSS method for managing insights into diet-microbiome interactions. *Trends in Biochemical Sciences* (2021) 46, 944 - 945.
 8. Lee MT, Le HH, and **Johnson EL**[†]. Dietary sphinganine is selectively assimilated by members of the mammalian gut microbiome. *Journal of Lipid Research* (2020) 62, 100034.
 - a. *JLR* commentary: [https://www.jlr.org/article/S0022-2275\(21\)00005-5/fulltext](https://www.jlr.org/article/S0022-2275(21)00005-5/fulltext)
 - b. *JLR* high visibility paper
 - c. *Cornell Chronicle*: <https://news.cornell.edu/stories/2020/09/study-tracks-how-milk-nutrients-shape-infant-microbiome>
 9. Le HH and **Johnson EL**[†]. Going Keto? Say β HB-ye Bye to Your Gut Bifidobacteria. *Cell Host & Microbe* (2020) 28, 3 - 5.

Publications from Postdoctoral Work

10. Pinto Y, Frishman S, Turjeman S, Eshel A, Nuriel-Ohayon M, Ziv O, Walters W, Parsonnet J, Ley C, **Johnson EL**, Schweitzer R, Khatib S, Magzal F, Tamir S, Gavish KT, Rautava S, Salminen S, Isolauri E, Yariv O, Peled Y, Poran E, Pardo J, Chen R, Hod M, Ley RE, Schwartz B, Hadar E, Louzoun Y, Koren O. Gestational diabetes is driven by microbiota-induced inflammation months before diagnosis. *Gut* (2021).
11. Di Rienzi SC, **Johnson EL**, Waters JL, Kennedy EA, Jacobson J, Lawrence P, Wang DH, Worgall TS, Brenna JT, Ley RE. The microbiome affects liver sphingolipids and plasma fatty acids in a murine model of the Western diet based on soybean oil. *Journal of Nutritional Biochemistry* (2021) 97, 108808.
12. **Johnson EL**, Heaver SL, Waters JL, Kim BI, Bretin A, Goodman A, Gewirtz A, Worgall T, Ley RE. Sphingolipids produced by gut bacteria enter host metabolic pathways impacting ceramide levels. *Nature Communications* (2020) 11, 2471.
 - a. 50 top articles in Nature Communications in 2020
13. Heaver SL, **Johnson EL**, Ley RE. Sphingolipids in host-microbial interactions. *Current Opinion in Microbiology* (2018) 43, 92 - 99.
14. **Johnson EL**, Heaver SL, Walters WA, Ley RE. Microbiome and metabolic disease: revisiting the bacterial phylum Bacteroidetes. *Journal of Molecular Medicine* (2017) 95, 1 - 8.

Publications from Graduate Work

15. Mitra M, **Johnson EL**, Swamy VS, Nersesian LE, Corney DC, Robinson DG, Taylor DG, Ambrus AM, Jelinek D, Wang W *et al.* Alternative polyadenylation factors link cell cycle to migration. *Genome Biology* (2018) 19, 176.
16. Lee HN, Mitra M, Bosompra O, Corney DC, **Johnson EL**, Rashed N, Ho LD, Collier HA. RECK isoforms have opposing effects on cell migration. *Molecular Biology of the Cell* (2018) 29, 1825 - 1838.
17. **Johnson EL**, Robinson DG, Collier HA. Widespread changes in mRNA stability contribute to quiescence-specific gene expression patterns in a fibroblast model of quiescence. *BMC Genomics* (2017) 18, 123.
18. Suh EJ, Remillard MY, Legesse-Miller A, **Johnson EL**, Lemons JMS, Chapman TR, Forman JJ, Kojima M, Silberman ES, Collier HA. A microRNA network regulates proliferative timing and extracellular matrix synthesis during cellular quiescence in fibroblasts. *Genome Biology* (2012) 13, 12.
19. Wang DJ, Legesse-Miller A, **Johnson EL**, Collier HA. Regulation of the let-7a-3 Promoter by NF-kappa B. *PLoS One* (2012) 7, e31240.
20. **Johnson EL**, Suh EJ, Chapman TR, Collier HA: Identifying Functional miRNA Targets Using Overexpression and Knockdown Methods. In: *Regulatory RNAs: Basics, Methods and Applications*. Edited by Mallick B, Ghosh Z. Berlin, Heidelberg: Springer Berlin Heidelberg; (2012) 295 - 317.
21. Legesse-Miller A, Raitman I, Haley EM, Liao A, Sun LL, Wang DJ, Krishnan N, Lemons JMS, Suh EJ, **Johnson EL et al.** Quiescent fibroblasts are protected from proteasome inhibition-mediated toxicity. *Molecular Biology of the Cell* (2012) 23, 3566 - 3581.
22. Lemons JMS, Feng XJ, Bennett BD, Legesse-Miller A, **Johnson EL**, Raitman I, Pollina EA, Rabitz HA, Rabinowitz JD, Collier HA. Quiescent Fibroblasts Exhibit High Metabolic Activity. *PLoS Biology* (2010) 8, e1000514.

Publications from Undergraduate Work

23. **Johnson EL**, Cunningham TW, Marriner SM, Kovacs JL, Hunt BG, Bhakta DB, Goodisman MAD. Resource allocation in a social wasp: effects of breeding system and life cycle on reproductive decisions. *Molecular Ecology* (2009) 18(13):2908 - 2920.

PREPRINTS

1. Thorn TL, Mitchell SB, Kim Y, Lee MT, Comrie JMC, **Johnson EL**, Aydemir TB. Metal transporter SLC39A14/ZIP14 modulates regulation between the gut microbiome and host metabolism. (2021). <https://www.biorxiv.org/content/10.1101/2021.12.22.473859v2>.

FUNDED PROJECTS

Granting Agency: Howard Hughes Medical Institute Role: PI
Award: HHMI Freeman Hrabowski Scholars Program
Award Period: September 2023 – August 2028
Title: Lipid-dependent host-microbe interactions that support infant development

Granting Agency: Cornell Schwartz Research Fund Visionary Grant Role: PI
Award Period: July 2023 – June 2026

Granting Agency: Pew Charitable Trust
Award Period: August 2022 – July 2026
Role: PI

Granting Agency: NIH NIGMS
Award Type: R35 (Early Stage Investigator MIRA)
Award Period: August 2020 – July 2025
Title: Sphingolipid-dependent host-microbe interactions
Role: PI

Granting Agency: CIFAR
Award Period: April 2021 – April 2023
Role: PI

Granting Agency: NSF
Award Period: September 2022 – August 2025
Title: IntBIO: Integrative Wildlife Nutrition: From Molecules and Microbes to Macro-Ecology
Role: Co-PI

Granting Agency: USDA
Award Period: January 2023 – December 2026
Title: Heme and non-heme iron intakes, gut microbiota, and influence on host iron absorption
Role: Co-I

PENDING FUNDING

Granting Agency: NIH NIGMS
Award Type: Administrative Supplement
Purpose: Equipment award for Illumina miniSeq
Award Period: August 2023 – May 2024
Role: PI

COMPLETED FUNDING

Granting Agency: Cornell Office for Academic Integration
Award Period: January 2022 – December 2022
Title: Interrogating the role of infant gut microbiome in immune responses to RSV infection
Role: Co-PI

Granting Agency: NIH NIGMS
Award Type: Administrative Supplement
Purpose: Equipment award for Fluorescence-Activated Cell Sorting System
Award Period: August 2021 – May 2022
Role: PI

Granting Agency: Biotechnology Resource Center Seed Grant
Award Period: November 2019 – March 2021
Title: Defining interactions of dietary lipids with the gut microbiome
Role: PI

TEACHING ACTIVITIES

Lead Instructor
• NS1220 Nutrition through the life cycle
Cornell University, Ithaca, NY
(Spring 2020, '21, '22, '23)

Guest Lecturer
• NS4200 “Dietary lipids as modulators of gut microbiome function”
• NS6140 “The microbiome during pregnancy, lactation, and early infant feeding”
• NS1220 “Diet and the Microbiome”
• BIOMI 3210 “Diet and the Microbiome”
Cornell University, Ithaca, NY
(Spring 2023)
(Fall 2019, '20, '21)
(Spring 2019)
(Spring 2016, '22)

Teaching Assistant		Princeton University, Princeton, NJ
• MOL 348	Cell and Developmental Biology	(Spring 2012)
• MOL 101B	From DNA to Human Complexity	(Fall 2011)
• MOL 214	Introduction to Cellular and Molecular Biology	(Spring 2010)

MENTORING EXPERIENCE

Postdoctoral Fellows

- Shanalee James, PhD Role: Research Mentor (Jan 2022 – Jan 2023)
- Henry Le, PhD Role: Research Mentor (Sept 2019 – Jul 2021)

Graduate Students – Role: Committee Chair

- Min-Ting Lee Nutritional Sciences (Jan 2019 – Jan 2023)
 - Awards: Center for Vertebrate Genomics scholar, CALS travel grant
- Janine Comrie Nutritional Sciences (Jan 2020 – present)
 - IMSD scholar, NIH T32 Trainee in Translational Nutrition Research
- Paula Banuelos Biomedical Sciences (Dec 2021 – present)
 - IMSD scholar, GEM fellowship

Graduate Students – Role: Committee Member

- Brianna Tate Animal Science (Jan 2019 – May 2022)
- Amanda Davis Animal Science (Jul 2018 – Jul 2020)
- Wanhui Kang Nutritional Sciences (Jun 2019 – Jun 2021)
- Xieyue Xiao Microbiology (Jun 2019 – present)
- Samantha Goldman Ecology and Evolutionary Biology (Jun 2020 – present)
- Cydney Jackson Food Science (Jan 2022 – present)
- Blake Mitchell Nutritional Sciences (Jan 2022 – present)
- Andrea Robinson Nutritional Sciences (Aug 2022 – present)
- Isabel Forlastro Biomedical Sciences (Dec 2021 - present)
- Arianna Ferguson Animal Sciences (May 2023 – present)

Undergraduate Students

- Rebecca Ekeanyanwu Role: Research Advisor (Sep 2019 – May 2020)
- Victoria Montero Role: Research Advisor (Jan 2019 – Aug 2019)
- Tyra Onley Role: Summer Research Advisor (Jun 2019 – Aug 2019)

PROFESSIONAL SERVICE

- Executive Committee, International Society for Research in Human Milk and Lactation (2021 -
- American Society for Nutrition, Member (2018 -
- International Society for Research in Human Milk and Lactation, Member (2018 -
- American Society for Microbiology, Member (2014 -
- American Society for Biochemistry and Molecular Biology, Member (2019 –
- Princeton University’s Black Graduate Caucus, President (2010 – 2013)
- Princeton University Molecular Biology Outreach, Founder (2008 – 2012)

UNIT, COLLEGE, and UNIVERSITY SERVICE

- Cornell Microbiome Supergroup Meeting, Founder and Organizer (2019 –
- Graduate Field of Nutrition

- Academics Affairs Committee (2020 – 2023)
- Nominations Committee (2019 – 2022)
- Cornell Coffee Connection, Founder and Organizer (2021 -

AD HOC REVIEWER

Nature Microbiology, Nature Chemical Biology, eLife, Molecular Nutrition and Food Research, Cell Press Community Review, Cell Host and Microbe, Nature Metabolism, PNAS, Cell, Nature Communications

INVITED TALKS

- 2023 UCSF Biochemistry and Biophysics Department Series
- 2023 Vanderbilt University VI4 Symposium
- 2022 Harvard University Department Biological Chemistry and Molecular Pharmacology Seminar
- 2022 NIH NHLBI Workshop: Role of the Microbiome in Heart, Lung, Blood, and Sleep Disorders
 - Selected Early Career Researcher
- 2022 University of Pennsylvania Prokaryotic Seminar
- 2022 UT Southwestern Excellence in Immunology Seminar
- 2022 UCSF Microbiome Symposium on Precision Medicine
- 2022 MIT Microbiome Club Symposium
 - Keynote speaker
- 2022 Baylor Microbiome Center Seminar
- 2022 Duke University Microbiome Center Seminar
- 2021 University of Connecticut Molecular and Cell Biology Seminar
- 2021 NIH NIGMS Judith Greenberg Early Career Lecture
 - Selected Speaker “Looking for lipids in all the right places: host-microbiome interactions”
 - 400+ participants
- 2021 Rice University Department of BioSciences Vanzant Seminar
- 2021 Weill Cornell Special Pediatrics Seminar
- 2021 Northwestern Biological Anthropology Seminar
- 2021 Harvard Chan Microbiome in Public Health Center Symposium
 - 400+ participants
- 2021 Sphingolipid Webinar
- 2021 San Diego State University
- 2021 Georgetown University Department of Biology Seminar
- 2021 Morehouse College Biology Department Seminar
- 2021 University of Oregon Seminar
- 2020 Penn State Microbiome Center Seminar
- 2020 Brown University Molecular Microbiology and Immunology Seminar
- 2020 eCornell Keynote: Supporting Mom’s and Babies
- 2020 Bates College Seminar
- 2019 Cornell BBS Symposium
- 2019 Center for Microbiome Innovation International Microbiome Meeting
- 2018 Precision Nutrition and Metabolism in Public Health and Disease
- 2016 ASM Beneficial Microbes