Sambhawa Priya
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Research Interests

Computational biology and machine learning for integrative analysis of genomics, microbiome, and longitudinal clinical data, with a focus on characterizing host–microbiome interactions and linking multi-omics signatures to disease risk and clinical outcomes.

Education

Ph.D. in Bioinformatics and Computational Biology University of Minnesota – Twin Cities, MN, USA Adviser: Dr. Ran Blekhman	11/2021
M.S. in Computer Science Lehigh University, PA, USA	05/2016
B.E. in Computer Science Manipal Institute of Technology, Karnataka, India	05/2010

Professional Experience

Postdoctoral Associate	University of Chicago, IL, USA	07/2024 – Present
Postdoctoral Fellow	Broad Institute of MIT and Harvard, Massachusetts General Hospital, Harvard Medical School, MA, USA	12/2021 – 06/2024
Research Assistant	University of Minnesota – Twin Cities, MN, USA	08/2016 – 11/2021
Graduate Research Intern	Mayo Clinic, MN, USA	06/2014 – 08/2014
Research and Teaching Assistant	Lehigh University, PA, USA	08/2011 – 05/2016
Undergraduate Research Intern	Carnegie Mellon University, PA, USA	06/2009 – 08/2009
Undergraduate Research Intern	University of Lodz, Poland	06/2008 – 08/2008

Fellowships and Funding

Under Review

- NIH K99/R00 Pathway to Independence Award, 2026 (under review)

Current and Past Funding

- Duchossois Family Institute (DFI) Chicago Fellowship, University of Chicago (**$188,623**), 10/2024 – 09/2026.
- Doctoral Dissertation Fellowship, University of Minnesota (approx. **$50,000**), 08/2019 – 05/2020.
- Bioinformatics and Computational Biology Graduate Fellowship, University of Minnesota (approx. **$50,000**), 08/2016 – 05/2017.

Honors and Awards

- Best Poster award in 10th Annual Bioinformatics Research Symposium, University of Minnesota, 2018.
- Microbial and Plant Genomics Institute Travel award ($489), 2018.
- First prize in the 2012 Semantic Web Challenge (Billion Triples Challenge Track), 2012.
- NSF Travel Grant, International Semantic Web Conference ($1,200), 2012.
- Award for Academic Excellence in Computer Science, Manipal Institute of Technology, 2009.

Selected Publications (Google Scholar, Citations: 2,053 | h-index: 14 (as of April 6, 2026))

1. **Priya S**, Burns MB, Ward T, Mars RAT, Adamowicz B, Lock E, Kashyap PC, Knights D, Blekhman R. (2022) "Identification of shared and disease-specific host gene–microbiome associations across human diseases using multi-omic integration". Nature Microbiology. DOI: 10.1038/s41564-022-01121-z.
2. Dayama G*, **Priya S***, Niccum DE, Khoruts A, Blekhman R. (2020) "Interactions between the gut microbiome and host gene regulation in cystic fibrosis". Genome Medicine. DOI: 10.1186/s13073-020-0710-2. (*co-first author)

3. Jabbar KS, **Priya S**, Xu J, Adhikari UD, Pishchany G, Johansen J, Thurimella K, Vlamakis H, Okello S, Lankowski A, Mosepele M, Siedner MJ, Plichta DR, Kwon DS, Xavier RJ. (2025) "HIV and antiretroviral therapies exert distinct influences across diverse gut microbiomes". Nature Microbiology. DOI: 10.1038/s41564-025-02157-7.
4. Ferretti P, Johnson K, **Priya S**, Blekhman R. (2026) "Genomics of host-microbiome interactions in humans". Nature Reviews Genetics. DOI: 10.1038/s41576-025-00849-8.

Publications (continued)

5. Libera KD, Adamowicz EM, Muehlbauer A, **Priya S**, Alazizi A, Luca F, Blekhman R. (2026) "Metabolic modeling and functional genomics reveal taxa and host gene interactions in colorectal cancer". bioRxiv. DOI: 10.64898/2026.01.26.700635.
6. Nirmalan S, Arif S, Wei J, **Priya S**, Blekhman R, Pique-Regi R, Luca F. (2026) "Host genotypes interact with microbial communities to modulate gene expression in the human intestine". medRxiv. DOI: 10.64898/2026.01.30.26344673.
7. Bramble MS, Vashist N, Ko A, **Priya S**, Musasa C, Spencer D, Lipson A, Mamona P, Karume K, Nsibu J, Manya H, Uy MNA, Colwell B, Boivin M, Mayambu B, Okitundu D, Mumba-Ngoyi D, Blekhman R, Tshala-Katumbay D, Vilain E. (2021) "The Gut Microbiome in Konzo". Nature Communications. DOI: 10.1038/s41467-021-25694-1.
8. Mihindukulasuriya KA, Mars RAT, Johnson AJ, Ward T, **Priya S**, Lekatz HR, Kalari KR, Droit L, Zheng T, Blekhman R, D'Amato M, Farrugia G, Knights D, Handley SA, Kashyap PC. (2021) "Multi-omics analyses show disease, diet, and transcriptome interactions with the virome". Gastroenterology. DOI: 10.1053/j.gastro.2021.06.077.
9. Mars RAT, Yang Y, Ward T, Houtti M, **Priya S**, Lekatz HR, Tang X, Sun Z, Kalari KR, Korem T, Bhattarai Y, Zheng T, Bar N, Frost G, Johnson AJ, van Treuren W, Han S, Ordog T, Grover M, Sonnenburg J, D'Amato M, Camilleri M, Elinav E, Segal E, Blekhman R, Farrugia G, Swann J, Knights D, Kashyap PC. (2020) "Longitudinal multi-omics reveals subset-specific mechanisms underlying irritable bowel syndrome". Cell. DOI: 10.1016/j.cell.2020.08.007.
10. **Priya S** and Blekhman R. (2019) "Population dynamics of the human gut microbiome: change is the only constant". Genome Biology. DOI: 10.1186/s13059-019-1775-3.
11. Brooks AW, **Priya S**, Blekhman R, Bordenstein SR. (2018) "Gut Microbiota Diversity across Ethnicities in the United States". PLoS Biology. DOI: 10.1371/journal.pbio.2006842.
12. Burns MB, Montassier E, Abrahante J, **Priya S**, Niccum DE, Khoruts A, Starr TK, Knights K, Blekhman R. (2018) "Colorectal cancer mutational profiles correlate with defined microbial communities in the tumor microenvironment", PLoS Genetics. DOI: 10.1371/journal.pgen.1007376.
13. Hale VL, Jeraldo P, Chen J, Mundy M, Yao J, **Priya S**, Keeney G, Lyke K, Ridlon J, White BA, French AJ, Thibodeau S, Diener C, Resendis-Antonio O, Gransee J, Dutta T, Petterson XT, Blekhman R, Boardman L, Larson D, Nelson H, Chia N. (2018) "Distinct Microbes, Metabolites, and Ecologies Define the Microbiome in Deficient and Proficient Mismatch Repair Colorectal Cancers". Genome Medicine. DOI: 10.1186/s13073-018-0586-6.
14. Clark CR, Maile M, Blaney P, Hellweg SR, Strauss A, Durose W, **Priya S**, Habicht J, Burns MB, Blekhman R, Abrahante JE, Starr TK. (2018) "Transposon mutagenesis screen in mice identifies TM9SF2 as a novel colorectal cancer oncogene", Scientific Reports DOI: 10.1038/s41598-018-33527-3.
15. Lynch J, Tang K, **Priya S**, Sands J, Sands M, Tang E, Mukherjee S, Knights D, Blekhman R. (2017) "HOMINID: A framework for identifying associations between host genetic variation and microbiome composition". GigaScience. DOI: 10.1093/gigascience/gix107.
16. **Priya S**, Jiang G, Dasari S, Zimmermann MT, Wang C, Heflin J, Chute CG. (2015) "A Semantic Web-based system for mining genetic mutations in cancer clinical trials". AMIA Summits on Translational Science Proceedings. PMID: 26306257; PMCID: PMC4525254.
17. Zhang X, Song D, **Priya S**, Daniels Z, Reynolds K, Heflin J. (2014) "Exploring Linked Data with Contextual Tag Clouds". Journal of Web Semantics: Science, Services and Agents on the World Wide Web. DOI: 10.1016/j.websem.2013.12.004.
18. **Priya S**, Guo Y, Spear M, Heflin J. (2014) "Partitioning OWL Knowledge Bases for Parallel Reasoning". In: Proc. of Eighth IEEE International Conference on Semantic Computing. DOI: 10.1109/ICSC.2014.34.
19. Zhang S, Song D, **Priya S**, Heflin J. (2013) "Infrastructure for Efficient Exploration of Large Scale Linked Data via Contextual Tag Clouds". In: Alani H. et al. (eds) The Semantic Web – ISWC 2013. ISWC 2013. Lecture Notes in Computer Science, vol 8218. DOI: 10.1007/978-3-642-41335-3_43.

Presentations

Upcoming

- (**Poster**) Biology of Genomes**,** Cold Spring Harbor Laboratory, May 2026.
- (**Talk**) Duchossois Family Institute (DFI) Research Presentation, June 2026

Invited Talks

- AI4B.io Webinar Series, AI for Bioscience Lab, DSM-Firmenich & TU Delft, November 2023.
- Sahlgrenska Academy, University of Gothenburg, Gothenburg, Sweden, October 2021.
- 14th Great Lakes Bioinformatics (GLBIO) conference, University of Minnesota, MN, May 2021.
- Machine Learning Applications to Phenomics and Genomics, Fall Symposium, Microbial and Plant Genomics Institute, University of Minnesota–Twin Cities, August 2018.
- 10th Annual Bioinformatics Research Symposium, University of Minnesota Rochester, January 2018.

Contributed Talks and Posters

- (**Talk**) Biology of Genomes, Cold Spring Harbor Laboratory, May 2021.
- (**Talk**) Biological Data Science, Cold Spring Harbor Laboratory, November 2020.
- (**Poster**) Microbiome, Cold Spring Harbor Laboratory, October 2020.
- (**Poster**) Microbiome, Cold Spring Harbor Laboratory, July 2019.
- (**Talk**) 3rd Workshop on Statistical and Algorithmic Challenges in Microbiome Data Analysis, Simons Foundation, New York, April 2019.
- (**Talk**) 5th Midwest Population Genetics Meeting, University of Minnesota, August 2018.
- (**Poster**) 7th Conference on Beneficial Microbes, Madison, Wisconsin, July 2018.
- (**Talk**) AMIA Joint Summits on Translational Science, San Francisco, March 2015.

Teaching Experience

- Guest Lecture: "Artificial Intelligence in Microbiome Research", GENE 46100 Deep Learning in Genomics, University of Chicago, Spring 2026.
- Designed and taught course module on "Introduction to Machine Learning using R", BICB 8510 Computation and Biology, University of Minnesota–Twin Cities, Spring 2021, Spring 2020.
- Teaching Assistant, Lehigh University (2013 – 2015)
    - Courses: Design and Analysis of Algorithms; Introduction to Java.
    - Supported instruction for undergraduate classes of 50–140 students
    - Conducted lab sessions, graded assignments and exams, held regular office hours, designed and delivered guest lectures, mentored students.

Mentorship Experience

Sabrina Arif
I mentored Sabrina as a graduate rotation student in at the University of Minnesota–Twin Cities in Spring 2021. Her rotation project focused on analyzing gut microbiome data from patients with cystic fibrosis. Sabrina recently successfully defended her PhD in Genetics, Genomics and Systems Biology program at the University of Chicago in 2025.

Liz Gibbons
Liz is currently a PhD student in the Blekhman Lab at the University of Chicago. I mentor Liz on machine learning approaches to integrate gut microbiome and single cell gene expression data from patients with Inflammatory Bowel Disease.

Rachna Saha
Rachna was a rotation student in the Blekhman Lab at the University of Chicago in Winter 2026. I mentored her on machine learning analyses to predict remission status in Inflammatory Bowel Disease using single cell gene expression and gut microbiome data.

Science Outreach and Service

Outreach:

- Organized science outreach activity on the topic of Human Microbiome at farmer's market as part of Market Science outreach program. (June 2019, June 2017)

Service:

- Workshop Organizer, "Machine Learning on Microbiome data" at the 14th Great Lakes Bioinformatics (GLBIO) conference, May 2021.
- Reviewer for Nature Communications, PLOS Computational Biology, Gut Microbes, Bioinformatics, Molecular Systems Biology, mSystems, Cell Host & Microbe (co-reviewer), npj Biofilms and Microbiomes, Human Genetics, Communications Biology – Nature, Scientific Data - Nature.
- Local organizing committee for International Semantic Web Conference (ISWC) 2015.

Professional and Technical Skills

- *Programming*: R (advanced), Python, Java, Scala, C/C++
- *Scientific skills*: microbiome analysis (metagenomics, 16S, metabolomics, viromics), genomic analysis (RNA-seq, whole genome sequencing), electronic health records analysis, machine learning/AI, multi-omics integration.