

# Shipra Vaishnava Ph.D.

Molecular Microbiology & Immunology

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## Academic Appointments

19-pres Manning Assistant Professor, MMI, Brown University

15-19 Assistant Professor, MMI, Brown University

## Education & Training

11-15 Instructor, Immunology Department, UTSW Medical Center, Dallas, TX, US

06-11 Post-doc, Immunology Department, UTSW Medical Center, Dallas, TX, US

00-06 Ph.D. in Cellular Biology, University of Georgia, GA, US

97-99 M.Sc. in Biotechnology, MS University, Baroda, India

93-96 B.Sc. in Botany, Delhi University, Delhi, India

## Honors & Awards

17 Kavli Fellow, National Academy of Sciences

11 Young IBD Investigator Award, Crohn's and Colitis Foundation of America

04 American Society of Tropical Medicine and Hygiene Scientific Award

02 Burroughs-Wellcome Fund Student Travel Award

## Research Funding

### Ongoing

1. NIH R01DK113265 04/01/18-03/31/23  
Role of epithelial cell intrinsic vitamin A metabolism in regulating immune function in the gut.  
Role: PI
2. DoD W81XWH1810281 08/01/18-01/31/21(NCE)  
Mapping Gut microbiota composition in-situ using high-resolution spatial microdissection technique.  
Role: PI

### Pending

1. DoD 04/01/21- 03/31/23  
Chi3l1-Microbiome Axis in Immune Checkpoint and P53 Regulation in Lung Cancer.  
Role: Co-PI
2. DoD (Expansion Award) 01/01/21- 12/31/23  
Role of dietary Zinc in regulating the spatial organization of gut microbes.  
Role: PI

### Completed

1. NIH/NIGMS/COBRE 06/01/16- 02/28/19  
Spatial and Functional Organization of Intestinal Microbiome.  
Role: Junior PI
2. URI/COBRE Pilot Project Program 06/01/16- 5/31/17

Role of vitamin A metabolism in immunity against intestinal bacteria.

Role: PI

3. CCFA Career development Award 01/01/14- 12/31/16  
Bacteria regulated vitamin A metabolism in the intestine.  
Role: PI
4. Salomon Award, Brown University 02/01/16- 06/30/17  
Regulation of gut microbiome biogeography.  
Role: PI

## Publications

### Assistant Professor Publications

- \*21. Duncan, K., Carey-Ewend, K., and **Vaishnav, S** (2020). Spatial analysis of gut microbiome reveals a distinct ecological niche associated with the mucus layer. bioRxiv 675918; doi: <https://doi.org/10.1101/675918>
20. Iyer N, Grizotte-Lake M, Duncan K, Gordon SR, Palmer ACS, Calvin C, Zhong G, Isoherranen N, **Vaishnav S** (2020). Epithelium intrinsic vitamin A signaling co-ordinates pathogen clearance in the gut via IL-18. PLoS Pathog. 16(4): e1008360.
19. Iyer, N and **Vaishnav, S.** (2019). Vitamin A at the interface of host-commensal-pathogen interactions. PLoS Pathog. 15(6): e1007750.
18. Grizotte-Lake M, Zhong G, Duncan K, Kirkwood J, Iyer N, Smolenski I, Isoherranen N, **Vaishnav S** (2018). Commensals Suppress Intestinal Epithelial Cell Retinoic Acid Synthesis to Regulate Interleukin-22 Activity and Prevent Microbial Dysbiosis. Immunity 49(6):1103-1115.e6.
17. Grizotte-Lake, M. and **Vaishnav, S** (2018). Autophagy: Suicide prevention hotline for the gut epithelium. Cell Host & Microbe 23(2):147-148.
16. Iyer, N., and **Vaishnav, S.** (2016). Alcohol Lowers Your (Intestinal) Inhibitions. Cell Host & Microbe 19, 131-133.
15. **Vaishnav, S.** (2016). The Intestinal Mucus Layer Comes of Age. Trends in Immunology 37, 3-4.

### Post-doctoral Publications

14. Derebe, M.G., Zlatkov, C.M., Gattu, S., Ruhn, K.A., **Vaishnav, S.**, Diehl, G.E., MacMillan, J.B., Williams, N.S., and Hooper, L.V. (2014). Serum amyloid A is a retinol binding protein that transports retinol during bacterial infection. eLife 3, e03206.
13. Raetz, M., Hwang, S.H., Wilhelm, C.L., Kirkland, D., Benson, A., Sturge, C.R., Mirpuri, J., **Vaishnav, S.**, Hou, B., DeFranco, A.L., et al. (2013). Parasite-induced TH1 cells and intestinal dysbiosis cooperate in IFN-gamma-dependent elimination of Paneth cells. Nature Immunology 14, 136-142.
12. **Vaishnav, S.**, Yamamoto, M., Severson, K.M., Ruhn, K.A., Yu, X., Koren, O., Ley, R., Wakeland, E.K., and Hooper, L.V. (2011). The antibacterial lectin RegIIIgamma promotes the spatial segregation of microbiota and host in the intestine. Science 334, 255-258.
11. **Vaishnav, S.**, and Hooper, L.V. (2011). Eat your carrots! T cells are RARing to go. Immunity 34, 290-292.
10. Ismail, A.S., Severson, K.M., **Vaishnav, S.**, Behrendt, C.L., Yu, X., Benjamin, J.L., Ruhn, K.A., Hou, B., DeFranco, A.L., Yarovinsky, F., et al. (2011). Gammadelta intraepithelial lymphocytes are essential mediators of host-microbial homeostasis at the intestinal mucosal surface. Proc. Natl. Acad. Sci. 108, 8743-8748.
9. Duerkop, B.A., **Vaishnav, S.**, and Hooper, L.V. (2009). Immune responses to the microbiota at the intestinal mucosal surface. Immunity 31, 368-376.
8. **Vaishnav, S.**, Behrendt, C.L., Ismail, A.S., Eckmann, L., and Hooper, L.V. (2008). Paneth cells directly sense gut commensals and maintain homeostasis at the intestinal host-microbial interface. Proc. Natl. Acad. Sci. 105, 20858-20863.

7. **Vaishnava, S.**, and Hooper, L.V. (2007). Alkaline phosphatase: keeping the peace at the gut epithelial surface. Cell Host & Microbe 2, 365-367.

#### Graduate School and Earlier Publications

6. Reiff, S.B., **Vaishnava, S.**, and Striepen, B. (2012). The HU protein is important for apicoplast genome maintenance and inheritance in *Toxoplasma gondii*. Eukaryotic Cell 11, 905-915.
5. **Vaishnava, S.**, and Striepen, B. (2006). The cell biology of secondary endosymbiosis--how parasites build, divide and segregate the apicoplast. Molecular Microbiology 61, 1380-1387.
4. Gubbels, M.J., **Vaishnava, S.**, Boot, N., Dubremetz, J.F., and Striepen, B. (2006). A MORN-repeat protein is a dynamic component of the *Toxoplasma gondii* cell division apparatus. Journal of Cell Science 119, 2236-2245.
3. Gaji, R.Y., Zhang, D., Breathnach, C.C., **Vaishnava, S.**, Striepen, B., and Howe, D.K. (2006). Molecular genetic transfection of the coccidian parasite *Sarcocystis neurona*. Molecular and Biochemical Parasitology 150, 1-9.
2. Vaishnava, S., Morrison, D.P., Gaji, R.Y., Murray, J.M., Entzeroth, R., Howe, D.K., and Striepen, B. (2005). Plastid segregation and cell division in the apicomplexan parasite *Sarcocystis neurona*. Journal of Cell Science 118, 3397-3407.
1. White, M.W., Jerome, M.E., **Vaishnava, S.**, Guerini, M., Behnke, M., and Striepen, B. (2005). Genetic rescue of a *Toxoplasma gondii* conditional cell cycle mutant. Molecular Microbiology 55, 1060-1071.

#### **Invited Talks**

##### Keynotes

- 08/19 NERIC Conference, Bretton Woods, NH  
08/13 Department of Cellular Biology Annual Retreat, University of Georgia, GA

##### National & International

- 01/20 UCSD Program in Immunology Seminar Series, La Jolla, CA  
11/19 Microbiology seminar Series, Dartmouth College, Hanover, NH  
11/19 Microbiome Innovation Summit, The Jackson Laboratory in Farmington, CT  
10/19 Mucosal Immunology Seminar Series at Mass General Hospital (MGH), Boston, MA  
10/19 Immunology Interest Group (IIG) Seminar Series at the National Institutes of Health (NIH)  
06/18 FASEB Nutritional Immunology Conference, Leesburg, VA  
09/17 Student invited seminar, Cell and Molecular Biology program, University of Rhode Island  
11/16 EMBO Innate Lymphocyte Cell Symposium, Berlin  
08/16 Mucosal Immunology Course and Symposium (MICS), Toronto  
03/16 Department of Biology Seminar Series, Boston College, MA  
04/14 School of Life Science, Ecole Polytechnique Federale de Lausanne (EPFL), Switzerland  
03/14 Food Science Department, University of Nebraska, NE  
03/14 Microbiology and Immunology Department, University of British Columbia, Canada  
02/14 Molecular Microbiology and Immunology department, Brown University, RI  
01/14 Department of Molecular Microbiology, UC Davis, CA  
12/13 Department of Biology, Carnegie Mellon University, PA  
04/13 Department of Microbiology and Immunology, University of Tennessee  
03/13 Department of Molecular Biology, Princeton, NJ  
02/13 Microbiology and Immunology Department, UCSF  
01/13 Molecular and Cell Biology Department, Berkeley, CA  
01/13 Department of Immunology, Duke University, NC  
01/13 Department of Pathology, Microbiology and Immunology, Vanderbilt University, TN  
05/11 Gut Microbiota in Health and Disease Symposium, EPFL, Switzerland

## Regional & Institutional

04/19 COBRE Center for Computational Biology of Human Disease, Brown University  
05/16 Pediatric Research Colloquium, Rhode Island Hospital, RI, 5/16  
08/15 Molecular & Cellular Biology, Brown University

## **Teaching & Mentoring**

### Classes directed

16-pres Co-director Biol1600, Development of Vaccines to Infectious Diseases  
17-pres Co-director Biol1250, Host-Microbiome Interactions in Health and Disease

### Guest lecturer

15-pres Biol1520, Innate Immunity  
18-pres Biol0100, Living Biology

### Postdocs

18-pres Geon Goo Han  
15-19 Namrata Iyer Currently: Marie Curie Fellow Trinity College, Dublin

### Graduate Students

19-pres Maryam Bonakdar  
17-pres Sarah Gordon  
15-20 Mayara Grizotte-Lake Currently: Post-doctoral fellow, MMI, Brown University  
15-20 Kellyanne Duncan Currently: Post-doctoral fellow, Broad Institute, MIT

### Undergraduate students

19-pres Masha Glik Independent study  
17-pres Gracie Whelan Honors thesis  
17-19 Douglas Wu Research assistant | Currently MD program at Ohio State  
16-19 Kelly Carey-Ewend Honors thesis | Currently: MD/Ph.D. program at UNC  
15-16 Joshua Hackney Research assistant | Currently: Grad student, JHU  
15 Monica Thapliya Leadership Alliance | Currently: Grad student, U Penn

### Thesis Committee

<b>Name</b>	<b>Period</b>	<b>Advisor</b>	<b>Advisory Role</b>
Ryan Xu	15-18	Amanda Jamieson	Thesis committee member
Jenna Perry	15-19	Chris de Graffenried	Thesis committee member
Aislinn Rowan	16-19	Peter Belenky	Thesis committee member
Gregory Thomson	17-20	Richard Bennett	Thesis committee member
Angela Tata	17-pres	Laurent Brossay	Thesis committee chair
Gregory Serpa	17-pres	Amanda Jamieson	Thesis committee chair
Jenna Wurster	18-pres	Peter Belenky	Thesis committee member
Michelle Zabat	17	Peter Belenky	Honors thesis second reader
Zemplen Pataki	17	Chris de Graffenried	Honors thesis second reader

## **Service**

### Intramural

18-pres Trainer in CCMB Graduate Program  
16-pres Concentration advisor in Human Health & Biology

16-pres                   Trainer in MCB Graduate Program  
15-pres                   Trainer in Pathobiology Graduate Program

Pathobiology Graduate Program Steering Committee, 2020-  
MMI Tenure Track Faculty Recruitment Committee 2019  
Brown University Community Council, 2017-2020  
Pathobiology Graduate Student Admissions Committee, 2016, 2018

Extramural

Co-Chair, Mucosal Immunology Block-Symposium, AAI Meeting, Austin Texas, May, 2018.

Grant Reviewing

06/20 NIDDK ZRG1 DKUS-P (02)

03/19 Review panel for Research Fellowship Award, Crohn's and Colitis Foundation of America (CCFA)

10/19 Reviewer for NIDDK (ZDK1 GRB-7 O1)

04/19 Reviewer for NIDDK (ZDK1 GRB-7 O1)

04/19 Ad hoc reviewer NIH NIAID R13

Journal Reviewing

Cell Host & Microbe

Cell Metabolism

Cell Stem Cell

Nature Communications

Immunity

Elife

PLOS Pathogen

Gut Microbes

NPJ Biofilms & Microbiome