

Abhishek Shrivastava, Ph.D.

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Research Experience and Education

- Aug. 2019 onwards** **Assistant Professor.** Arizona State University, School of Life Sciences.
The Biodesign Institute. Center for Fundamental and Applied Microbiomics and Center for Biological Physics, Tempe, AZ 85281.
- Sept. 2013 – July 2019** **Postdoctoral Fellow.** Microbiology & Physics. Department of Molecular & Cellular Biology, Harvard University, Cambridge, MA. **Primary Advisor:** Howard C. Berg.
- April 2017- July 2019** **NIH K99/R00 Fellow.** Recipient of *NIH K99/R00 Pathway to Independence Award* to study the bacterial type 9 secretion system and its role in the formation of human oral polymicrobial communities. **Primary Advisor:** Howard C. Berg, Harvard University. **Co-Advisor:** Floyd E. Dewhirst: The Forsyth Institute.
- April 2017 – July 2019** **Visiting Scientist.** The Forsyth Institute, Cambridge, MA 02142.
- Aug. 2017 – July 2019** **Scientist.** The Rowland Institute at Harvard, Cambridge, MA 02142. (joint appointment with Harvard MCB)
- Oct 2016 - Nov 2016** **Student.** Marine Biological Laboratory, Woods Hole, MA.
Physical Biology of the Cell Course. **Research Advisor:** Jane Kondev.
Instructors: Rob Phillips, Julie Theriot, Hernan Garcia.
- May 2013 - Oct. 2013** **Research Fellow:** The Medical College of Wisconsin, Milwaukee, WI 53226.

- Aug. 2008 - April 2013** **PhD:** Molecular Microbiology. **Primary Advisor:** Mark J. McBride. University of Wisconsin-Milwaukee, WI 53211. Recipient of *Ruth Walker award*.
- July 2006 - May 2008** **MSc:** Biochemistry. MS University of Baroda, India. Recipient of *Junior Research Fellowship (JRF-NET)*, Center of Scientific and Industrial Research (*CSIR*), *New Delhi, India*.
- July 2003 - May 2006** **BSc:** Biotechnology. SP University, India. Graduated with Distinction.

Publications

2020.

1. **Shrivastava A.** and Berg H. C. A molecular rack and pinion actuates a cell-surface adhesin and enables bacterial gliding motility. *Science Advances*, **2020**, 6 (10) eaay6616.

2018-2019.

2. **Shrivastava A****, Patel V., Tang Y., Yost S.C., Dewhirst F.E., and Berg H.C**. Cargo transport shapes the spatial organization of a microbial community. *Proc Natl Acad Sci*, **2018**. August 115(34) 8633-8638. *Featured by NIH-NIDCR News & Harvard MCB News*. ** Corresponding Authors.
3. Johnston J.J.*, **Shrivastava A.***, and McBride M.J. Untangling *Flavobacterium johnsoniae* gliding motility and protein secretion. *Journal of Bacteriology*. **2018** January 200, no.2 e00362-17. * Equal Contribution.

2016-2017.

4. **Shrivastava A.****, Roland T., Berg H. C.** The screw-like movement of a gliding bacterium is powered by spiral motion of a cell-surface adhesin. *Biophysical Journal*. **2016** September, 111(5): 1008-13. *Featured on the Cover of Biophysical Journal. Featured by: Microbial Sciences Initiative (MSI) News*. ** Corresponding Authors.

5. Lele P. P., Roland T., **Shrivastava A.**, Chen Y and Berg H. C. The flagellar motor of *Caulobacter crescentus* generates more torque when a cell swims backwards. *Nature Physics*. **2016** February; 12(2): 175-178.

2014-2015.

6. **Shrivastava A.**, and Berg H. C. Towards a model for *Flavobacterium* gliding. *Current Opinions in Microbiology*. **2015** October, 28: 93-97.
7. Lele P. P., **Shrivastava A.**, Roland T and Berg H.C. Response thresholds in bacterial chemotaxis. *Science Advances*. **2015** October; 1(9) e1500299.
8. **Shrivastava A.**, Lele P. P. and Berg H. C. A rotary motor drives *Flavobacterium* gliding. *Current Biology*, **2015** February; 25(3): 338-341. *Featured by: Harvard Gazette*.

2010-2013.

9. **Shrivastava A.**, Johnston J. J., van Baaren J. M. and McBride M. J. *Flavobacterium johnsoniae* GldK, GldL, GldM, and SprA are required for secretion of the cell-surface gliding motility adhesins SprB and RemA. *Journal of Bacteriology*, **2013** July; 195(14): 3201-3212
10. **Shrivastava A.**, Rhodes R. G., Nakane D, Pochiraju S and McBride M. J. *Flavobacterium johnsoniae* RemA is a mobile cell surface lectin involved in gliding. *Journal of Bacteriology*, **2012** Jul; 194(14):3678-88.
11. Rhodes R.G., Samarasan M.N., **Shrivastava A.**, van Barren J. M., Pochiraju S, Bolampalli S and McBride M. J. *Flavobacterium johnsoniae* *gldN* and *gldO* are partially redundant genes required for gliding motility and surface localization of SprB. *Journal of Bacteriology*, **2010** Mar; 192(5):1201-11

Awards and Honors

1. **Scialog Fellow:** to participate in an initiative jointly sponsored by RCSA, the Allen Frontiers Group, and the Cottrell foundation. 2021.
2. **NIH K99/R00 Pathway to Independence Award:** To study the modes of motility, sensory transduction, protein secretion and spatial organization of the subsequent biofilm formation by bacteria of the human microbiome. 2017-2023
3. **Marine Biological Laboratories Scholarship:** MBL, Woods Hole, MA. 2016.
4. **Travel Award:** Annual Biomedical Research Conference for Minority Students, Tampa, FL, 2016
5. **Postdoctoral Fellow Best Poster Award:** MCB Retreat, Harvard University. 2014.
6. **Ruth Walker Grant in Aid:** University of Wisconsin-Milwaukee. 2012, 2010.
7. **Chancellors Graduate Award:** University of Wisconsin-Milwaukee. 2008-2012.
8. **Graduate School Travel Award:** University of Wisconsin-Milwaukee. 2012, 2010.
9. **Department of Bio Science Travel Award:** University of Wisconsin-Milwaukee. 2010.
10. **Junior Research Fellowship (JRF-NET):** Council of Scientific and Industrial Research (CSIR), New Delhi, India. 2008.

Research Talks

Invited Research Talks

1. Department of Microbiology, the Ohio State University, February 2021.
2. Chair of the 'microbial interactions and communities' session of the 16th Bacterial Locomotion and Sensory Transduction (BLAST) conference. January 2021.
3. Virtual Advanced Imaging Series, Biomedicine Discovery Institute, Monash University, Australia. December 2020.
4. Parsons Microbial Systems Seminar, Department of Civil & Environmental Engineering, Massachusetts Institute of Technology (MIT), Cambridge, MA 02139. April 2019.

5. Department of Basic Science and Craniofacial Biology, New York University, New York, NY 10010. April 2019.
6. Division of Gastroenterology, Department of Medicine, University of Wisconsin Madison, WI 53705. Feb. 2019.
7. Department of Microbiology, University of Chicago, IL 60637. Feb. 2019.
8. The Biodesign Institute and School of Life Sciences, Arizona State University, Tempe, AZ 85281. Jan. 2019.
9. Department of Biology, Virginia Tech University, Blacksburg, VA 24061. Jan. 2019.
10. Department of Microbiology and Molecular Genetics, McGovern Medical School, University of Texas Health Science Center, Houston, TX 77030. Dec. 2018.
11. Department of Biology, University of Delaware, Newark DE. 19716. Nov. 2018.
12. Microbial Science Initiative (*MSI*) chalk-talk, Harvard University, Cambridge, MA, Oct. 2018.
13. The Forsyth Institute, Cambridge, MA 02138. July 2018.
14. Department of Molecular and Cellular Biology Retreat, Harvard University, Cambridge, MA. September 2017
15. American Physical Society (*APS*) March Meeting. Baltimore, MD. March 2016.
16. National Center for Biological Sciences-Tata Institute of Fundamental Research (*NCBS-TIFR*), Bangalore, India. April 2016.
17. Department of Biology, Indiana University, Bloomington, IN. November 2015.
18. The Forsyth Institute, Harvard School of Dental Medicine, Cambridge, MA. October 2015.
19. Milwaukee Microbiology Society Seminar Series, Great Lakes Water Institute. 2012.

Contributed Research Talks

20. General Session of the International Association of Dental Researchers (*IADR*), London, UK, July 2018. Session *Co-chair: Microbiome Session*.
21. Beneficial Microbes Meeting. Madison, WI, July 2018.

22. Boston Bacterial Meeting. Cambridge, MA, June 2018.
23. The Biophysical Society Annual Meeting. San Francisco, CA. February 2018.
24. Winter Quantitative Biology Conference, Maui, HI, February 2018.
25. Bacterial Locomotion and Sensory transduction (*BLAST*) meeting. New Orleans, LA. January 2017.
26. American Society for Microbiology (*ASM*) Microbe 2016. Boston, MA. June 2016
27. Flavobacterium meeting. Auburn, AL. October 2015.
28. Molecular Genetics of Bacteria and Phages meeting. Madison, WI. August 2015.
29. Boston Bacterial Meeting, Cambridge, MA. June 2015
30. Bacterial Locomotion and Sensory transduction (*BLAST*) meeting. Tucson, AZ. January 2015.

Selected Poster Presentations

1. Cargo Transport Shapes the Spatial Organization of a Microbial Community. *ASM Biofilms Meeting*, Washington D.C. October 2018.
2. A Molecular Rack and Pinion Machinery Drives Surface Translocation. *Gordon Research Conference on Sensory Transduction in Microorganisms*. Ventura, CA. January 2018.
3. Bacterial Rock and Roll. *Gordon Research Conference on Sensory Transduction in Microorganisms*. Ventura, CA. January 2016.
4. Surface Navigation by Bacteria. *MCB Retreat*, Marine Biological Labs, Woods Hole, MA. September 2014. **Best poster award.**
5. Bacterial Surface Translocation and Type IX Secretion System. *Boston Bacterial Meeting*, Cambridge, MA. June 2014.
6. Bacterial Gliding Machinery. *Gordon Research Conference on Sensory Transduction in Microorganisms*. Ventura, CA. January 2014.
7. Identification of a Mobile Cell-surface Adhesin. *Gordon Research Conference on Bacterial Cell Surfaces*. Dover, VT. June 2012.
8. The Type IX Secretion System: A Novel Protein Translocation Machinery. *American Society for Microbiology (ASM) General meeting*, San Diego, CA. May 2010.

Teaching, service, and mentoring

After joining ASU.

(a) Teaching.

1. **Spring 2021.** BIO/MIC 498/591 titled '*Programming for Biologists*' (Python)
2. **Fall 2021.** Served as an instructor for MIC 501, Foundations in Microbiology.
3. **Spring 2020.** Developed and taught a new course BIO/MIC 498/591 titled '*Programming for Biologists*' (MATLAB and Python)
4. **Fall 2019.** Served as a reader for MIC 401.

(b) Service.

1. Served on the SOLS Microbiology graduate admissions committee.
2. Served as a member of the SOLS MCB graduate executive/admissions committee.

(c) **Mentorship.** I am currently mentoring 2 postdoctoral fellows, 2 PhD students, and 4 undergraduate researchers.

Before joining ASU.

1. **2013-2019.** Mentored seven undergraduate students in Independent Research at Harvard University, Cambridge, MA.. Mentored the following Summer Research Students that were **Biology, Physics** and **Engineering** majors. These students performed interdisciplinary research, under my supervision.
2. Served as a Judge to evaluate presentations by Undergraduate Students in the field of *Molecular and Computational Biology* at the Annual Biomedical Research Conference for Minority Students, Tampa, FL. 2016.
3. Co-chair, Career Development Committee, Faculty of Arts and Sciences Postdoctoral Association, Harvard University, Cambridge, MA.
4. Coach for Cellular Dynamics seminar series at MCB Dept., Harvard University. Cambridge, MA. 2013.

5. **2008-2013.** Trained 4 undergraduate students in independent research and mentored new graduate students at University of Wisconsin-Milwaukee, Milwaukee, WI.
6. Graduate Teaching Assistant, UW-Milwaukee. Courses taught: BIO SCI 383: General Microbiology laboratory: Fall 2010, Fall 2009, Spring 2008 BIO SCI 698: Independent Study in Microbiology: Spring 2010.

Selected Courses and Workshops Attended

1. **Physical Biology of the Cell**, Marine Biological Laboratories, Woods Hole, MA, 2016.
2. **Harvard Center for Biological Imaging Workshops**, MCB Dept., Cambridge, MA. 2016.
3. **DIY Microbiomes and Metabolomes:** American Society for Microbiology Meeting, Boston, MA 2016.
4. **Data Visualization with Python**, Institute for Advanced Computational Sciences (IACS), Harvard University, Cambridge, MA, 2016.

Ad hoc Reviewer

2019-2020:

Nature Microbiology, Proc. Nat. Acad. Sci. (PNAS), Applied Environmental Microbiology, Communications Biology, Microorganisms, Anaerobe, French National Research Agency (ANR).

2013-2018.

Proc. Nat. Acad. Sci. (PNAS), Biophysical Journal, International Society for Microbial Ecology (ISME) Journal, FEMS Microbiology Letters, Bioresource Technology, Microbial Cell Factories, Anaerobe, Computational and Structural Biotechnology, Scientific Reports.