

Navish Wadhwa, Ph.D.

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Professional Experience and Education

- 2022- **Assistant Professor**
Department of Physics and the Biodesign Center for Mechanisms of Evolution
Arizona State University
- 2016-2022 **Postdoctoral Fellow in Molecular and Cellular Biology**
Harvard University
Mentor: Howard C. Berg
- 2012-2015 **Ph.D. in Physics**
Technical University of Denmark
Mentors: Anders P. Andersen, Thomas Kjørboe, Tomas Bohr
- 2010-2012 **M.S. in Engineering Mechanics**
Virginia Polytechnic Institute and State University
Mentor: Sunghwan Jung
- 2008-2010 **Junior Research Fellowship**
National Centre for Biological Sciences
Mentor: Sanjay Sane
- 2004-2008 **B.Tech. in Mechanical Engineering**
Indian Institute of Technology Delhi

Research Funding

- 2020 – 2025 **NIH K99/R00** Pathway to Independence, National Institute of General Medical Sciences
Identifying the mechanisms of mechanosensing by the bacterial flagellar motor
Direct cost: \$936,640, Role: PI

Honors and Awards

- 2021 **Intersections Science Fellows Symposium** Associate (2nd prize for short talk)
- 2019 **Meselson Prize for the most beautiful experiment of the year**, MCB Harvard
- 2017 Society of General Physiologists Scholar, Marine Biological Laboratory
- 2014 **Young Scientist Award**, European Mechanics Society
Otto Mønsted Foundation Travel Award (\$1340)
- 2013 Best Poster Award, Department of Physics, Technical University of Denmark
- 2012 Otto Mønsted Foundation Travel Award (\$1100)
- 2010 **Milton Van Dyke Award**, American Physical Society Division of Fluid Dynamics
- 2009 Junior Research Fellowship, National Centre for Biological Sciences
- 2006 Keshar Devi Scholarship, Indian Institute of Technology Delhi

Additional Training

- 2021 The Inclusive STEM Teaching Project (5 weeks)
“Lab Dynamics: Management Skills for Scientists”, by Dr. Carl M. Cohen (4 days)

Additional Training (continued)

- 2017 Physiology course, Marine Biological Laboratory (7 weeks)
Visiting Scientist with Dr. Jennifer Lippincott-Schwartz, Janelia Research Campus (2 weeks)
- 2016 Advanced Bacterial Genetics course, Cold Spring Harbor Laboratories (3 weeks)
- 2014 Particle Image Velocimetry course, German Aerospace Center (4 days)

Publications

*: equal contribution, ‡: corresponding author

14. **Wadhwa, N.**, Sassi, A., Berg, H. C., & Tu, Y. (2022). A multi-state dynamic process confers mechano-adaptation to the bacterial flagellar motor. *bioRxiv*. doi:10.1101/2021.12.22.473861
13. Hu, H., Santiveri, M., **Wadhwa, N.**, Berg, H. C., Erhardt, M., & Taylor, N. M. (2021). Structural basis of torque generation in the bi-directional bacterial flagellar motor. *Trends in Biochemical Sciences*, 47(2), 160–172.
12. **Wadhwa, N.*‡**, & Berg, H. C.*‡. (2021). Bacterial motility: Machinery and mechanisms. *Nature Reviews Microbiology*.
11. **Wadhwa, N.‡**, Tu, Y., & Berg, H. C. (2021). Mechanosensitive remodeling of the bacterial flagellar motor is independent of direction of rotation. *Proceedings of the National Academy of Sciences*, 118(15), e2024608118.
10. Santiveri, M., Roa-Eguiara, A., Kühne, C., **Wadhwa, N.**, Hu, H., Berg, H. C., ... Taylor, N. M. (2020). Structure and function of stator units of the bacterial flagellar motor. *Cell*, 183(1), 244–257.e16.
9. **Wadhwa, N.‡**, Phillips, R., & Berg, H. C. (2019). Torque-dependent remodeling of the bacterial flagellar motor. *Proceedings of the National Academy of Sciences*, 116(24), 11764–11769.
8. Andersen, K. H., Berge, T., Gonçalves, R. J., ..., **Wadhwa, N.**, & Kiørboe, T. (2016). Characteristic sizes of life in the oceans, from bacteria to whales. *Annual Review of Marine Science*, 8(1), 217–241.
7. Andersen, A., **Wadhwa, N.**, & Kiørboe, T. (2015). Quiet swimming at low reynolds number. *Physical Review E*, 91, 042712.
6. Martens, E. A.*‡, **Wadhwa, N.*‡**, Jacobsen, N. S., Lindemann, C., Andersen, K. H., & Visser, A. (2015). Size structures sensory hierarchy in ocean life. *Proceedings of the Royal Society B*, 282(1815), 20151346.
5. Kiørboe, T., Jiang, H., Gonçalves, R. J., Nielsen, L. T., & **Wadhwa, N.** (2014). Flow disturbances generated by feeding and swimming zooplankton. *Proceedings of the National Academy of Sciences*, 111(32), 11738–11743.
4. **Wadhwa, N.‡**, Andersen, A., & Kiørboe, T. (2014). Hydrodynamics and energetics of jumping copepod nauplii and copepodids. *Journal of Experimental Biology*, 217(17), 3085–3094.
3. **Wadhwa, N.**, Vlachos, P., & Jung, S. (2013). Noncoalescence in the oblique collision of fluid jets. *Physical Review Letters*, 110, 124502.
2. **Wadhwa, N.**, & Jung, S. (2011). Non-coalescence of jets. *Physics of Fluids*, 23(9), 091105.
1. **Wadhwa, N.**, Jain, V., Fowlkes, J. B., Bull, J. L., & Eshpuniyani, B. (2010). A boundary element model of multiple microcirculatory bubbles in cardiovascular. *International Journal of Emerging Multidisciplinary Fluid Sciences*, 2, 143–160.

Invited Talks and Seminars

- 2022 9th World Congress of Biomechanics, Taipei City, Taiwan
Biological Physics & Physical Biology Seminar series
- 2021 University of California at Merced, Soft, Living, Active and Adaptive Matter seminars
Harvard University, Kavli seminars
École Polytechnique Fédérale de Lausanne, Physics of Living Systems seminars
Microscale Ocean Biophysics seminars
- 2020 Yale Quantitative Biology Institute (cancelled due to Covid-19)
- 2019 Princeton University, Center for the Physics of Biological Function
Brandeis University, Materials Research Science and Engineering Center
- 2018 Brown University, Division of Applied Mathematics Fluids and Thermal Sciences
- 2015 Cambridge Department of Applied Mathematics and Theoretical Physics
Max Planck Institute for Terrestrial Microbiology
- 2014 Harvard School of Engineering and Applied Sciences
- 2012 Jawaharlal Nehru Centre for Advanced Scientific Research

Presentations

- 2021 Gordon Research Conference - Stochastic Physics in Biology, Ventura, CA
American Physical Society March Meeting, virtual
Biophysical Society Meeting, virtual
- 2020 Physics of Living Matter 15, virtual
Gordon Research Conference - Sensory Transduction in Microorganisms, Ventura, CA
- 2019 American Society of Cell Biology Conference, Washington, DC
Bacterial Locomotion and Signal Transduction Conference, New Orleans, LA
- 2017 American Society of Cell Biology Conference, Philadelphia, PA
Bacterial Locomotion and Signal Transduction Conference, New Orleans, LA
- 2014 American Physical Society's Division of Fluid Dynamics Meeting, San Francisco, CA
European Fluid Mechanics Conference, Kgs. Lyngby, Denmark
Active Fluids Workshop, Mariehamn, Åland
- 2013 International workshop on Trait-based approaches to Ocean Life, Copenhagen, Denmark
Complex Motion in Fluids Summer School, Humlebæk, Denmark
Microscale interactions in aquatic environments, Les Houches, France
- 2012 American Physical Society's Division of Fluid Dynamics Meeting, San Diego, CA
- 2011 American Physical Society's Division of Fluid Dynamics Meeting, Baltimore, MD

Teaching

- 2020 Guest lecturer, *Freshman Seminars: Physics*, Emory University
- 2014 Instructor, "Consulting project", Technical University of Denmark
Teaching Assistant, *Experimental Methods and Instrumentation in Physics*, Technical University of Denmark
- 2013 Guest lecturer, *Introduction to Biophysics*, Technical University of Denmark
Guest lecturer, *Physical Oceanography*, Technical University of Denmark

Teaching (continued)

- 2012 Instructor, *Foundations of Physics Laboratory*, Virginia Tech
2011 Instructor, *Mechanical Behavior of Materials*, Virginia Tech
Teaching Assistant, *Dynamics*, Virginia Tech
2010 Teaching Assistant, *Statics*, Virginia Tech

Mentoring

- 2019 Jinming Yang (visiting student). After: Ph.D. student at Yale U., Physics
Sophia Belser (visiting student). After: M.Phil. student at U. Cambridge, Biotechnology
2018 Olenka Jain (undergraduate researcher). After: Ph.D. student at Princeton U., Quantitative and Computational Biology
Daozheng Gong (visiting student). After: Ph.D. student at U. Chicago, Biophysics
Siyu He (visiting student). After: Ph.D. student at Columbia U., Biomedical Engineering
2017 Isabel Esain Garcia (visiting student). After: Ph.D. student at U. Cambridge, Chemistry
2016 Ying Zuo (visiting student). After: Ph.D. student at Hong Kong U. Sci. Tech.

Service and outreach

- 2021- Community task force on diversity, inclusion and belonging, MCB Harvard
Website and Public Relations Committee, MCB Harvard
2021 American Physical Society DBIO tweetorial, “A bio-nanomachine that never ceases to amaze”
Keynote Session Chair, Bacterial locomotion and signal transduction meeting
2020 Judge, ENVISION (proposal-writing competition for high-school girls, organized by Women in STEM)
2019 Social media contributor, Biophysical Journal
2017 Judge, Massachusetts State Science & Engineering Fair
Panelist, Harvard iGEM club, SynBio Research Panel
2016 Finance committee, Harvard FAS postdoctoral association
2014 Volunteer, Science in the City (science festival organized by EuroScience Open Forum)
2011 Volunteer, ‘Imagination Camp’ (STEM outreach program at Virginia Tech, targeted at middle-school students)
2014- Reviewer: *PLOS One*, *eLife*, *Physical Review Letters*, *Nature Communications*, *Proceedings of the National Academy of Sciences*, National Science Foundation, *Physical Review X*, *Physical Review E*, *Frontiers in Marine Science*, *The American Naturalist*, *Communications Biology*, *Biomolecules*, *Journal of Physics D*, and *Journal of Experimental Marine Biology and Ecology*