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 Kiørboe, 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

Awards and Honors

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

2010 **Milton Van Dyke Award**, American Physical Society Division of Fluid Dynamics

2009 Junior Research Fellowship, National Centre for Biological Sciences

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
Total cost: $936,640, Role: PI

Additional Training

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

2017 Physiology course, Marine Biological Laboratory (7 weeks)
Visiting Scientist with Dr. Jennifer Lippincott-Schwartz, Janelia Research Campus (2 weeks)

Additional Training (continued)

2016 Advanced Bacterial Genetics course, Cold Spring Harbor Laboratories (3 weeks)

2014 Particle Image Velocimetry course, German Aerospace Center (4 days)

Publications

[#]: corresponding author; [†]: equal contribution

1. **Wadhwa, N.**[#†], & Berg, H. C.[#†]. (2022). Bacterial motility: Machinery and mechanisms. *Nature Reviews Microbiology*, *20*, 161–173.
2. **Wadhwa, N.**[#†], Sassi, A.[†], Berg, H. C., & Tu, Y.[#]. (2022). A multi-state dynamic process confers mechano-adaptation to a biological nanomachine. *Nature Communications*, *13*, 5327.
3. 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.
4. **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.
5. 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.
6. **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.
7. 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.
8. Andersen, A., **Wadhwa**, **N.**, & Kiørboe, T. (2015). Quiet swimming at low reynolds number. *Physical Review E*, *91*, 042712.
9. **Wadhwa, N.**[#†], Martens, E. A.[#†], 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.
10. 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.
11. **Wadhwa, N.**[#], Andersen, A., & Kiørboe, T. (2014). Hydrodynamics and energetics of jumping copepod nauplii and copepodids. *Journal of Experimental Biology*, *217*(17), 3085–3094.
12. **Wadhwa**, **N.**, Vlachos, P., & Jung, S. (2013). Noncoalescence in the oblique collision of fluid jets. *Physical Review Letters*, *110*, 124502.
13. **Wadhwa**, **N.**, & Jung, S. (2011). Non-coalescence of jets. *Physics of Fluids*, *23*(9), 091105.
14. **Wadhwa**, **N.**, Jain, V., Fowlkes, J. B., Bull, J. L., & Eshpuniyani, B. (2010). A boundary element model of multiple microcirculatory bubbles in cardiovasculature. *International Journal of Emerging Multidisciplinary Fluid Sciences*, *2*, 143–160.

Invited Talks

2022 Arizona State University, Center for Immunotherapy, Vaccines, and Virotherapy seminar series

Arizona State University, BII/CME Seminar Series on Mechanisms of Cellular Evolution

Arizona State University, Physics Colloquium

Invited Talks (continued)

Arizona State University, Biodesign Graduate Program seminar series
9th World Congress of Biomechanics, Taipei City, Taiwan
Biological Physics & Physical Biology seminar series
Northeastern University, Department of Biology
Arizona State University, Department of Physics
Purdue University, Department of Physics and Astronomy
Northwestern University, Department of Molecular Biosciences
Johns Hopkins University, Thomas C. Jenkins Department of Biophysics

2021 University of California at Merced, Soft, Living, Active and Adaptive Matter seminar series
Harvard University, Kavli seminar series
École Polytechnique Fédérale de Lausanne, Physics of Living Systems seminar series
Microscale Ocean Biophysics seminar series

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

Conference 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

Conference presentations (continued)

2011 American Physical Society's Division of Fluid Dynamics Meeting, Baltimore, MD

Teaching

At Arizona State University

2022 PHY 121: University Physics I: Mechanics

EVO 501: Current Topics in Evolutionary Biology

PHY 191: Physics Frontiers at ASU (guest lecturer)

MIC 501: Foundations in Microbiology (1-week module)

Before Arizona State University

2014 Experimental Methods and Instrumentation in Physics (Teaching Assistant)

2012 Foundations of Physics Laboratory

2011 Mechanical Behavior of Materials

Dynamics (Teaching Assistant)

2010 Statics (Teaching Assistant)

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

Service to Discipline/Profession

2021 Keynote Session Chair, Bacterial locomotion and signal transduction meeting

2014- *Ad hoc* reviewer: The American Naturalist; Biomolecules; Communications Biology; eLife; Frontiers in Marine Science; Journal of Experimental Biology; Journal of Experimental Marine Biology and Ecology; Journal of Physics D; mBio; National Science Foundation; Nature Communications; Physical Review E; Physical Review Letters; Physical Review X; PLOS One; Proceedings of the National Academy of Sciences

Committees

2022 Community task force on diversity, inclusion and belonging, MCB Harvard

Website and Public Relations Committee, MCB Harvard

Service and outreach (continued)

2016 Finance committee, Harvard FAS postdoctoral association

Outreach

2021 American Physical Society DBIO tweetorial, "A bio-nanomachine that never ceases to amaze"

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

2014 Volunteer, Science in the City (science festival organized by EuroScience Open Forum)