Navish Wadhwa, Ph.D.

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Education and Training

Current	**K99 Postdoctoral Fellow** Harvard University
2015	**Ph.D. in Physics** Technical University of Denmark
2012	**M.S. in Engineering Mechanics** Virginia Polytechnic Institute and State University
2008	**B.Tech. in Mechanical Engineering** Indian Institute of Technology Delhi

Research Experience

2016 –	**Postdoctoral Research**, Harvard University Biophysics and mechanobiology of the bacterial flagellar motor Mentors: Dr. Howard Berg and Dr. Ethan Garner
2012-2015	**Graduate Research**, Technical University of Denmark Physics of swimming and sensing in marine organisms Mentors: Dr. Anders Andersen, Dr. Thomas Kiørboe, Dr. Tomas Bohr
2010-2012	**Graduate Research**, Virginia Polytechnic Institute and State University Physics of non-coalescence between fluid jets Mentor: Dr. Sunghwan Jung
2008-2010	**Junior Research Fellowship**, National Centre for Biological Sciences Biomechanics of insect flight Mentor: Dr. Sanjay Sane
2007-2008	**Undergraduate Research**, Indian Institute of Technology Delhi Computational modeling of microscale flows and bubbles in cardiovascular channels Mentor: Dr. Brijesh Eshpuniyani

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)
2016	Advanced Bacterial Genetics course, Cold Spring Harbor Laboratories (3 weeks)
2014	Particle Image Velocimetry course, German Aerospace Center (4 days)

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

Publications

*: equal contribution, ‡: corresponding author

14. 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*.

13. **Wadhwa, N.***‡, & Berg, H. C.*‡. (2021). Bacterial motility: Machinery and mechanisms. *Nature Reviews Microbiology*.

12. **Wadhwa, N.***‡, Sassi, A.*, Berg, H. C., & Tu, Y.‡. (2021). A multi-state dynamical process underpins mechano-adaptation in the bacterial flagellar motor. *bioRxiv*. doi:10.1101/2021.12.22.473861

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).

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 cardiovasculature. *International Journal of Emerging Multidisciplinary Fluid Sciences*, *2*, 143–160.

Invited Talks and Seminars

2022 9th World Congress of Biomechanics, Taipei City, Taiwan

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 (continued)

	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
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*

References

Prof. Howard C. Berg
Herchel Smith Professor of Physics and Professor of Molecular and Cellular Biology
Harvard University
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Prof. Anders P. Andersen
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Prof. Thomas Kiørboe
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