

Navish Wadhwa, Ph.D.

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Current position

- 2020 – **Principal Investigator** of NIH K99/R00 Award (NIGMS K99GM134124)
- 2016 – Postdoctoral fellow, Harvard University
Advisors: Dr. Howard Berg and Dr. Ethan Garner

Education

- 2012 – 2015 Ph.D., Physics, Technical University of Denmark
Thesis: *Zooplankton hydrodynamics – An investigation into the physics of aquatic interactions.*
Advisors: Dr. Anders Andersen, Dr. Thomas Kjørboe, Dr. Tomas Bohr
- 2010 – 2012 M.S., Engineering Mechanics, Virginia Tech.
Thesis: *Non-coalescence of jets.*
Advisor: Dr. Sunghwan Jung
- 2004 – 2008 B.Tech., Mechanical Engineering, Indian Institute of Technology Delhi.
Thesis: *Boundary element method (BEM) modeling of cardiovascular bubble dynamics.*
Advisor: Dr. Brijesh Eshpuniyani

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: \$950,000, Role: PI.

Select Awards and Honors

- 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 Fluid Mechanics Conference.
- 2010 **Gallery of Fluid Motion Winner**, American Physical Society.
Milton Van Dyke Award, American Physical Society.
- 2009 Junior Research Fellowship, National Centre for Biological Sciences.

Training and Courses

- 2017 Visiting Scientist, Janelia Research Campus
Advisor: Jennifer Lippincott-Schwartz
Student, Physiology course, Marine Biological Laboratory.
Supervisors: Rob Phillips, Jennifer Lippincott-Schwartz, Wallace Marshall
- 2016 Student, Advanced Bacterial Genetics course, Cold Spring Harbor Laboratories.
Supervisors: Andrew Camilli, Lionello Bossi, Houra Merrikh
- 2008-2010 Junior Research Fellow, National Centre for Biological Sciences.
Supervisors: Sanjay Sane

Publications and preprints

‡corresponding author, * co-first author

- 1 **Wadhwa, N.**[‡], Tu, Y., & Berg, H. C. (2021). Mechanosensitive remodeling of the bacterial flagellar motor is independent of direction of rotation. *bioRxiv*. [doi:10.1101/2021.01.19.427295](https://doi.org/10.1101/2021.01.19.427295)
- 2 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. [doi:10.1016/j.cell.2020.08.016](https://doi.org/10.1016/j.cell.2020.08.016)
- 3 **Wadhwa, N.**[‡], Phillips, R., & Berg, H. C. (2019). Torque-dependent remodeling of the bacterial flagellar motor. *Proc. Natl. Acad. Sci.*, 116(24), 11764–11769. [doi:10.1073/pnas.1904577116](https://doi.org/10.1073/pnas.1904577116)
- 4 Andersen, K., Berge, T., Gonçalves, R., Hartvig, M., Heuschele, J., Hylander, S., ... Kjørboe, T. (2016). Characteristic sizes of life in the oceans, from bacteria to whales. *Annu. Rev. Mar. Sci.*, 8(1), 217–241. [doi:10.1146/annurev-marine-122414-034144](https://doi.org/10.1146/annurev-marine-122414-034144)
- 5 Andersen, A., **Wadhwa, N.**, & Kjørboe, T. (2015). Quiet swimming at low reynolds number. *Phys. Rev. E*, 91, 042712. [doi:10.1103/PhysRevE.91.042712](https://doi.org/10.1103/PhysRevE.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. *Proc. R. Soc. B*, 282(1815), 20151346. [doi:10.1098/rspb.2015.1346](https://doi.org/10.1098/rspb.2015.1346)
- 7 Kjørboe, T., Jiang, H., Gonçalves, R. J., Nielsen, L. T., & **Wadhwa, N.** (2014). Flow disturbances generated by feeding and swimming zooplankton. *Proc. Natl. Acad. Sci.*, 111(32), 11738–11743. [doi:10.1073/pnas.1405260111](https://doi.org/10.1073/pnas.1405260111)
- 8 **Wadhwa, N.**[‡], Andersen, A., & Kjørboe, T. (2014). Hydrodynamics and energetics of jumping copepod nauplii and copepodids. *J. Exp. Biol.*, 217(17), 3085–3094. [doi:10.1242/jeb.105676](https://doi.org/10.1242/jeb.105676)
- 9 **Wadhwa, N.**, Vlachos, P., & Jung, S. (2013). Noncoalescence in the oblique collision of fluid jets. *Phys. Rev. Lett.*, 110, 124502. [doi:10.1103/PhysRevLett.110.124502](https://doi.org/10.1103/PhysRevLett.110.124502)
- 10 **Wadhwa, N.**, & Jung, S. (2011). Non-coalescence of jets. *Phys. Fluids*, 23(9), 091105. [doi:10.1063/1.3640005](https://doi.org/10.1063/1.3640005)
- 11 **Wadhwa, N.**, Jain, V., Fowlkes, J. B., Bull, J. L., & Eshpuniyani, B. (2010). A boundary element model of multiple microcirculatory bubbles in cardiovascular. *Int. J. Emerg. Multidiscip. Fluid Sci.*, 2, 143–160.

Recent invited and conference talks

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| 2021 | École polytechnique fédérale de Lausanne, Physics of Living Systems Seminar (Invited)
Microscale Ocean Biophysics Seminar Series (Invited)
Annual March meeting of the American Physical Society, Online |
| 2020 | Physics of Living Matter 15, Online |
| 2019 | Princeton University, Center for the Physics of Biological Function (Invited)
Annual ASCB EMBO Meeting, Washington, DC
Brandeis University, Materials Research Science and Engineering Center (Invited) |
| 2018 | Brown University, Division of Applied Mathematics Fluids and Thermal Sciences (Invited) |

Service

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| 2021 | Keynote Session Chair, Bacterial locomotion and signal transduction meeting |
| 2016 | Finance Committee, Harvard FAS Postdoctoral Association |

Service (continued)

Ad hoc 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*, *American Naturalist*, *Communications Biology*, *Biomolecules*, *Journal of Physics D*, and *Journal of Experimental Marine Biology and Ecology*

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
- 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

Supervision

- 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: Undergrad at Harvard U.
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 Ph.D. student at Hong Kong U. Sci. Tech.

Outreach

- 2020 Judge, ENVISION (proposal-writing competition organized by Women in STEM)
- 2019 Social media contributor, Biophysical Journal
- 2017 Judge, Massachusetts State Science & Engineering Fair
- 2014 Volunteer, Science in the City (science festival organized by EuroScience Open Forum)