

Swathi Nachiar Manivannan

PhD candidate in Ecology and Evolutionary Biology, Yale University
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I am an evolutionary biologist interested in understanding the underlying mechanisms that shape the capacity of microbes to adaptively evolve.

EDUCATION

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| PhD in Ecology and Evolutionary Biology Yale University | 08/2022—present (Expected 05/2028) New Haven, CT, USA |
| Proposed thesis: <i>The path(s) to optimality: towards a mechanistic understanding of evolvability in (pathogenic) microbes</i> Thesis Committee: C. Brandon Ogbunugafor (advisor), Richard O. Prum, Günter P. Wagner, Jeremy Draghi | |
| MS in Ecology and Evolutionary Biology Yale University | 08/2022—12/2024 New Haven, CT, USA |

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| BA (Hons) in Natural Sciences (Genetics) Homerton College, University of Cambridge | 10/2018—06/2021 Cambridge, UK |
| Thesis: <i>The genetics of hybridisation: What systems biology-based models can tell us</i> (Advised by John J. Welch) | |

RESEARCH EXPERIENCE

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| Graduate Research Fellow (PI: C. Brandon Ogbunugafor) Department of Ecology & Evolutionary Biology, Yale University | 08/2022—present |
| Research Officer (PI: Sebastian Maurer-Stroh) Bioinformatics Institute, A*STAR, Singapore | 02/2022—06/2022 |
| Research Officer (PI: Swaine Chen) Genome Institute of Singapore, A*STAR, Singapore | 07/2021—01/2022 |
| Undergraduate Research (Part II Genetics) Student (PI: John J. Welch) University of Cambridge | 11/2020—03/2021 |
| Undergraduate Research Student (PI: Simon A. Levin) International Student Internship Program, Princeton University | 06/2020—09/2020 |
| Undergraduate Research Student (PI: Wei Leong Chew) Genome Institute of Singapore, A*STAR, Singapore | 07/2019—08/2019 |

HONOURS AND AWARDS

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| CRC Mellon Pedagogy Fellow, RITM, Yale University | 2025 |
| Sterling Prize Fellowship, Yale University | 2022—2024 |
| A*STAR National Science Scholarship (PhD) | 2022—present |
| David Thompson Scholarship, Homerton College, University of Cambridge | 2019 |
| A*STAR National Science Scholarship (BS) | 2018—2021 |

GRANTS

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| Yale Institute for Biospheric Studies (YIBS) Small Early Grant (\$3000) | 2023 |
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PUBLICATIONS

Peer-reviewed articles

3. **Manivannan, S.N.**, Diaz Arenas, C., Grubaugh, N.D. & Ogbunugafor, C.B. (2025). *The importance of epistasis in the evolution of viral pathogens*. Virus Evolution, 11(1), veaf091.
2. **Manivannan, S.N.**, Levin, S.A. (2023). *Modelling the evolutionary dynamics of an infectious disease with an initial asymptomatic stage with recovery*. SIAM Undergraduate Research Online, 16.

- Chen, L., Park, J.E., Paa, P., Rajakumar, P.D., Prekop, H-T., Chew, Y.T., **Manivannan, S.N.**, & Chew, W.L. (2021). *Programmable C:G to G:C genome editing with CRISPR-Cas9-directed base excision repair proteins*. Nature Communications, 12(1).

In review

- Manivannan, S.N.** & Ogbunugafor, C.B. *Deconstructing empirical fitness seascapes across scales of granularity*.
- Surasinghe, S.*, **Manivannan, S.N.***, Crawford, L. & Ogbunugafor, C.B. *Classification and regression trees clarify the role of epistasis and environment in genotype–phenotype maps*.
- Ogbunugafor, C.B., Kabengele, K., **Manivannan, S.N.**, Surasinghe, S., Crawford, L. & Scarpino, S.V. *The identifiability challenge of implementing social determinants into computational epidemiology*.
- Surasinghe, S., **Manivannan, S.N.**, Scarpino, S.V., Crawford, L., Ogbunugafor, C.B. *Structural causal influence (SCI) captures the forces of social inequality in models of disease dynamics*.

Magazine article(s)

- Manivannan, S.N.** *The construction of a metropolis, or the cost of uprooting*. The Yale Environmentalist Spring 2023 (p. 66-67).
- Giovanetti-Singh, G.*, Kent, R.*., **Manivannan, S.N.*** October 2021. *Hidden Figures*. BlueSci Issue 52 (p.18-23).

*denotes shared first author

TALKS AND POSTERS

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| (Lightning Talk) Ecology and Evolution of Infectious Diseases Early Career Researchers Symposium, Yale University | 02/2026 |
| (Lightning Talk) Graduate Research in Ecology, Behaviour and Evolutionary Biology, Rutgers University | 02/2026 |
| (Poster) Molecular Mechanisms in Evolution, Gordon Research Conference & Seminar | 06/2025 |
| (Invited Talk) Fisher's Fishes | 06/2025 |
| (Talk) Ecology & Evolutionary Biology Graduate Student Symposium, Yale University | 12/2024 |
| (Invited Talk) Li-Richter lab group, Institute of Ecology & Evolution, Universität Bern | 05/2024 |

TEACHING EXPERIENCE**Yale University**

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| McDougal Graduate Teaching Fellow Poorvu Center for Teaching and Learning, Yale University | 2024—present |
| Teaching Fellow Evolution and Medicine (E&EB 335) , Yale University | 2023 |
| Teaching Fellow Principles of Ecology and Evolutionary Biology (BIOL 104) , Yale University | 2023 |
| Teaching Fellow Biology of Terrestrial Arthropods (E&EB250, E&EB251L) , Yale University | 2022 |

University of Cambridge

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| Volunteer Teaching Assistant A Level Chemistry Long Road Sixth Form College (STIMULUS Cambridge) | 10/2019—03/2020 |
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PROFESSIONAL DEVELOPMENT

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| SLiM Workshop , American Natural History Museum | 10/2024 |
| Complexity Global School for Emerging Political Economics , Santa Fe Institute and Universidad de los Andes | 07/2024 |
| Evolutionary Biology Graduate Student Workshop , Department of Biology, University of Virginia | 07/2023 |

MENTORSHIP**Undergraduate Senior Thesis**

Kemper Lowry (Yale Anthropology and E&EB'25)

Women in Science at Yale (WISAY)

1 undergraduate, 2 Master's students

PROFESSIONAL SERVICE**Contributing Writer**

The Yale Environmentalist, BlueSci, Varsity (Features), The Cambridge Language Collective

Institutional Service

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| Organising Team, Spring Teaching Forum , Poorvu Center for Teaching and Learning, Yale University | 2026 |
| Co-organiser, Graduate Student Symposium , Department of Ecology and Evolutionary Biology, Yale University | 2026 |
| Organising Team, Complexity Coffee , Complexity Global School, Santa Fe Institute | 2025—present |

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| Organising Team, Spring Teaching Forum , Poorvu Center for Teaching and Learning, Yale University | 2025 |
| International Committee Chair and Student Representative (E&EB) , Graduate Student Assembly, Yale University | 2024—2025 |
| Organiser, Hutchinson Speaker seminars , Department of Ecology and Evolutionary Biology, Yale University | 2023—2024 |
| Talk Coordinator for Science in the News , Yale Science Communication (<i>A graduate student organisation</i>) | 2023 |
| International Students' Representative , Women's Campaign, Cambridge Students' Union | 2020—2021 |
| International Officer , Homerton Union of Students, Homerton College, University of Cambridge | 2019—2020 |

Other Service

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| Tamil Translator , Covid-19 Migrant Support Coalition (CMSC) in Singapore | 2020—2021 |
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