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

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

MS in Ecology and Evolutionary Biology 08/2022—12/2024
Yale University New Haven, CT, USA

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

RESEARCH EXPERIENCE

Graduate Research Fellow (PI: C. Brandon Ogbunugafor) 08/2022—*present*
Department of Ecology & Evolutionary Biology, Yale University

Research Officer (PI: Sebastian Maurer-Stroh) 02/2022—06/2022
Bioinformatics Institute, A*STAR, Singapore

07/2021—01/2022
Research Officer (PI: Swaine Chen)
Genome Institute of Singapore, A*STAR, Singapore

Undergraduate Research (Part II Genetics) Student (PI: John J. Welch) 11/2020—03/2021
University of Cambridge

Undergraduate Research Student (PI: Simon A. Levin) 06/2020—09/2020
International Student Internship Program, Princeton University

Undergraduate Research Student (PI: Wei Leong Chew) 07/2019—08/2019
Genome Institute of Singapore, A*STAR, Singapore

HONOURS AND AWARDS

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

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

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.

1. 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

3. 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.*
2. 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.*
1. 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)

2. **Manivannan, S.N.** *The construction of a metropolis, or the cost of uprooting.* The Yale Environmentalist Spring 2023 (p. 66-67).
1. 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

(Poster) Molecular Mechanisms in Evolution, Gordon Research Conference & Seminar 06/2025
(Invited Talk) Fisher's Fishes 06/2025
(Talk) E&EB Graduate Student Symposium, Yale University 12/2024
(Invited Talk) Bank and Li-Richter lab groups, Institute of Ecology & Evolution, Universität Bern 05/2024

TEACHING EXPERIENCE

Yale University

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

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

PROFESSIONAL DEVELOPMENT

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

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*
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 *(A graduate student organisation)* 2023
International Students' Representative, Women's Campaign, Cambridge Students' Union 2020—2021

International Officer, Homerton Union of Students 2019—2020

Other Service

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