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 May 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

Sterling Prize Fellowship, Yale University 2022
A*STAR National Science Scholarship (PhD) 2022
David Thompson Scholarship, Homerton College, University of Cambridge 2019
A*STAR National Science Scholarship (BS) 2018

GRANTS

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

PUBLICATIONS

Peer-reviewed articles

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 (SIURO), Volume 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

2. **Manivannan, S.N,** Diaz Arenas, C., Grubaugh, N.D., Ogbunugafor, C.B. *The importance of epistasis in the evolution of viral pathogens.*
1. Surasinghe, S., **Manivannan, S.N,** Diaz Arenas, C., Grubaugh, N.D., Ogbunugafor, C.B. 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).

*contributed equally

INVITED/CONTRIBUTED PRESENTATIONS

Contributed

1. **Manivannan, S.N,** Ogbunugafor, C.B. *Measuring evolvability in fitness landscapes: What do mutations tell us about "evolvability potential"?* Graduate Student Symposium, Ecology & Evolutionary Biology, Yale University (Dec 2024)

Invited

1. **Manivannan, S.N,** Diaz Arenas, C., Grubaugh, N.D., Ogbunugafor, C.B. *Does epistasis belong in the canon of viral genomic epidemiology?* Bank and Li-Richter lab groups, Institute of Ecology and Evolution, Universität Bern (May 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 — 10/2024
American Natural History Museum and Ben Haller, Cornell University — *New York City, NY, USA*

Complexity Global School for Emerging Political Economics — 07—08/2024
Santa Fe Institute and Universidad de los Andes — *Bogotá, Colombia*

Evolutionary Biology Graduate Student Workshop — 07/2023
Department of Biology, University of Virginia — *Mountain Lake Biological Station, VA, USA*

MENTORSHIP

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

Women in Science at Yale (WISAY)
1 undergraduate, 2 Master's students

LEADERSHIP & OUTREACH EXPERIENCE

University

International Committee Chair and Student Representative (E&EB) — 05/2024—*present*
Graduate Student Assembly, Yale University

Student Organiser, Hutchinson Speaker seminars — 06/2023—05/2024
Department of Ecology and Evolutionary Biology, Yale University

Talk Coordinator for Science in the News 02/2023—05/2023
Yale Science Communication *(A graduate student organisation)*

International Students' Representative 10/2020—06/2021
Women's Campaign, Cambridge Students' Union

International Officer 09/2019—06/2020
Homerton Union of Students

Others

Tamil Translator 07/2020—09/2021
Covid-19 Migrant Support Coalition (CMSC) in Singapore

Contributing Writer 04/2020—06/2021
Varsity (Features); The Cambridge Language Collective