Rohan Maddamsetti

Department of Biochemistry and Microbiology
School of Environmental and Biological Sciences, Rutgers University—New Brunswick
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EMPLOYMENT

Rutgers, The State University of New Jersey, New Brunswick, NJ
Assistant Professor (2025–), Department of Biochemistry and Microbiology, School of Environmental and Biological Sciences

Duke University, Durham, NC
Postdoctoral Research Fellow (2020–2024), Center for Quantitative Biodesign, advised by Prof. Lingchong You

Old Dominion University, Norfolk, VA
Visiting Assistant Professor (2018–2020), Department of Biological Sciences

Harvard Medical School, Boston, MA
Postdoctoral Research Fellow (2016–2018), Department of Systems Biology, advised by Prof. Debora Marks

Indiana University, Bloomington IN
Research Associate (2009), in Prof. Michael Lynch's evolutionary genetics lab.

EDUCATION

Michigan State University, East Lansing MI
PhD (2016), Evolution, Ecology and Behavioral Biology, Department of Integrative Biology, advised by Dr. Richard Lenski

Brown University, Providence RI
Sc.B (2008) with Honors in Computational Biology, advised by Dr. Daniel Weinreich

PREPRINTS AND WORKING PAPERS

Maddamsetti R, Hamrick G, Ha Y, Baig Y, Lu J, Lee C, You L. Emergence of population-level feedback control by transposon-plasmid coevolution. *Submitted.*

Ha Y, **Maddamsetti R**, Chen X, Şimşek E, Lee D, Son H-I, Lee C, Kussell E, You L. Transposon-plasmid nesting enables fast response to fluctuating environments. https://doi.org/10.1101/2025.06.04.657954 In review at *Nature Ecology and Evolution*.

Shahzadi I, Xue W, **Maddamsetti R**, You L, Wang T. Predicting plasmid copy number with machine learning. In review at *Nature Computational Science*.

Lu J, Luo N, Liu S, Sahu K, **Maddamsetti R**, Baig Y, You L. Discovery of interpretable patterning rules by integrating mechanistic modeling and deep learning. https://doi.org/10.1101/2024.09.02.610872 In review at *Nature Chemical Biology*.

PEER-REVIEWED PUBLICATIONS

Maddamsetti R, Shyti I, Wilson ML, Son HI, Baig Y, Zhou Z, Lu J, You L. Scaling laws of plasmids across the microbial tree of life. *Nature Communications*. https://doi.org/10.1038/s41467-025-61205-2

Maddamsetti R, You L. 2025. The Abundance of Viroid-Like RNA *Obelisk-S.s* in *Streptococcus sanguinis SK36* May Suffice for Evolutionary Persistence. *Journal of Molecular Evolution.* https://doi.org/10.1007/s00239-025-10250-y

Tsoi R, Son H, Hamrick GS, Tang K, Bethke JH, Lu J, **Maddamsetti R**, You L. 2025. A predatory gene drive for targeted control of self-transmissible plasmids. *Science Advances*.

Hamrick G, **Maddamsetti R**, Son H, Wilson M, Davis H, You L. 2024. Programming dynamic division of labor using horizontal gene transfer. *ACS Syn. Bio.* https://doi.org/10.1021.acssynbio.3c00615

Maddamsetti R, Yao Y, Wang T, Gao J, Huang V, Hamrick G, Son H, You L. 2024. Duplicated antibiotic resistance genes reveal ongoing selection and horizontal gene transfer in bacteria. *Nature Communications*. https://doi.org/10.1038/s41467-024-45638-9

Benham S, Dutta S, **Maddamsetti R**, Wright C, Anderson A, Gauthier D, Gaff H. 2024. Contrasting tick species behaviors: A course-based undergraduate research experience (CURE). *SPORA: A Journal of Biomathematics*. https://doi.org/10.61403/2473-5493.1081

Maddamsetti R*, Grant N*. 2022. Discovery of positive and purifying selection in metagenomic time series of hypermutator microbial populations. *PLOS Genetics.* https://doi.org/10.1371/journal.pgen.1010324.

Maddamsetti R. Idiosyncratic purifying selection on metabolic enzymes in the long-term evolution experiment with *Escherichia coli*. 2022. *Genome Biology and Evolution.* https://doi.org/10.1093/gbe/evac114

Yao Y, **Maddamsetti R**, Weiss A, Ha Y, Wang T, Wang S, You L. Intra- and interpopulation transposition of mobile genetic elements driven by antibiotic selection. 2022. *Nature Ecology & Evolution*. https://doi.org/10.1038/s41559-022-01705-2

Maddamsetti R. Selection maintains protein interactome resilience in the long-term evolution experiment with *Escherichia coli*. 2021. *Genome Biology and Evolution.* https://doi.org/10.1093/gbe/evab074

Maddamsetti R. Universal constraints on protein evolution in the long-term evolution experiment with *Escherichia coli*. 2021. *Genome Biology and Evolution*. https://doi.org/10.1093/gbe/evab070

Grant N, **Maddamsetti R**, Lenski RE. 2021. Maintenance of metabolic plasticity despite relaxed selection in a long-term evolution experiment with *Escherichia coli*. *The American Naturalist*. https://doi.org/10.1086/714530

Green AG, Elhabashy H, Brock KP, **Maddamsetti R**, Kohlbacher O, Marks DS. 2021. Large-scale discovery of protein interactions at residue resolution using co-evolution calculated from genomic sequences. *Nature Communications*. **12**: 1–12.

Maddamsetti R, Grant N. 2020. Divergent evolution of mutation rates and biases in the long-term evolution experiment with Escherichia coli. *Genome Biology and Evolution*. **12**: 1591–1603.

Blount ZD*, **Maddamsetti R***, Grant N*, Ahmed ST, Jagdish T, Sommerfeld BA, Tillman A, Moore J, Slonczewski JL, Barrick JE, Lenski RE. 2020. Genomic and phenotypic evolution of *Escherichia coli* in a novel citrate-only resource environment. *eLife*. **9:** e55414.

Schubert B*, **Maddamsetti R***, Nyman J, Farhat MR, Marks DS. 2019. Genome-wide discovery of epistatic loci affecting antibiotic resistance in *Neisseria gonorrhoeae* using evolutionary couplings. *Nature Microbiology*. **4:** 328–338.

Maddamsetti R, Johnson DT, Spielman SJ, Petrie KL, Marks DS, Meyer JR. 2018. Gain-of-function experiments with bacteriophage lambda uncover residues under diversifying selection in nature. *Evolution*. **72:** 2234–2243.

Maddamsetti R, Lenski RE. 2018. Analysis of bacterial genomes from an evolution experiment with horizontal gene transfer shows that recombination can sometimes overwhelm selection. *PLOS Genetics*.**14:** e1007199.

Maddamsetti R, Hatcher PJ, Green A, Williams BJ, Marks DS, Lenski RE. 2017. Conserved core genes evolve rapidly in a long-term experiment with *Escherichia coli*. *Genome Biology and Evolution* doi: 10.1093/gbe/evx064.

Maddamsetti R. Gene flow in microbial communities could explain unexpected patterns of synonymous variation in the *Escherichia coli* core genome. 2016. *Mobile Genetics Elements*. **6:** e1137380.

Stapleton JA, Kim J, Hamilton JP, Wu M, Irber LC, **Maddamsetti R**, Briney B, Newton L, Burton DR, Brown CT et al. 2016. Haplotype-phase synthetic long reads from short-read sequencing. *PLOS One*. **11**: e0147229.

Lenski RE, Wiser MJ, Ribeck N, Blount ZD, Nahum JR, Morris JJ, Zaman L, Turner CB, Wade BD, **Maddamsetti R** et al. 2015. Sustained fitness gains and variability in fitness trajectories in the long-term evolution experiment with *Escherichia coli*. *Proceedings of the Royal Society B* **282:** 20152292.

Maddamsetti R, Hatcher PJ, Cruveiller S, Médigue C, Barrick JE, Lenski RE. 2015. Synonymous genetic variation in natural isolates of *Escherichia coli* does not predict where synonymous substitutions occur in a long-term experiment. *Molecular Biology and Evolution* **32**: 2897–2904.

Maddamsetti R, Lenski RE, Barrick JE. 2015. Adaptation, clonal interference, and frequency-dependent interactions in a long-term evolution experiment with *Escherichia coli*. *Genetics* **200**: 619–631.

Lucas-Lledó JI, **Maddamsetti R**, Lynch M. 2011. Phylogenomic analysis of the uracil-DNA glycosylase superfamily. *Molecular Biology and Evolution* **28**: 1307–1317.

Rinaudo, K., Bleris, L., **Maddamsetti, R**., Subramanian, S., Weiss, R., & Benenson, K. 2007. A universal RNAi-based logic evaluator that operates in mammalian cells. *Nature Biotechnology* **25**: 795–801.

*Equal contribution

TALKS

Invited Speaker, Department of Microbiology and Biochemistry, Rutgers University–New Brunswick, 2024, New Brunswick NJ
Invited Speaker, Gordon Research Seminar on Microbial Population Biology, 2023, Andover NH
Invited Speaker, South Texas Center for Emerging Infectious Diseases Seminar, University of Texas at San Antonio, 2022, San Antonio TX.
Invited Speaker, Departmental Seminar, Trinity University, 2022, San Antonio TX.
Invited Speaker, EEBio Seminar, University of Virginia, 2020, Charlottesville VA.
Invited Speaker, Departmental Seminar, Old Dominion University 2019, Norfolk VA.
Invited Speaker, BioMath Seminar, College of William and Mary, 2019.
Speaker, Southeastern Population Ecology and Evolutionary Genetics (SEPEEG) conference 2018.
Invited Speaker, Special Seminar, Old Dominion University 2018, Norfolk VA.
Invited Speaker, W.D. Hamilton symposium, Society for the Study of Evolution 2016, Austin TX.
Speaker, Gordon Research Seminar on Microbial Population Biology 2015, Andover NH
Speaker, Society for the Study of Evolution 2014, Raleigh, NC, 6/20/2014.
Speaker, 2013 Environmental Science and Policy Program Research Symposium 2013, Michigan State University, East Lansing, MI
Speaker, BEACON Center for the Study of Evolution in Action, Michigan State University, East Lansing, MI, 10/4/2013.

AWARDS, FELLOWSHIPS, GRANTS

NIH NIGMS Award Supplement, July 2023: $78,382.62 award for purchase of Illumina MiniSeq.

Duke Microbiome Center Voucher grant, December 2021: "Mobile genetic elements promote specific evolutionary paths to high-level tetracycline resistance": $10,000 award for whole-genome sequencing.

Duke University Compact for Open Access Publishing Equity (COPE) Grant: $2000 award to cover page charges in PLOS Genetics for "Discovery of positive and purifying selection in metagenomic time series of hypermutator microbial populations".

ODU CURE grant, May 2019: "Active learning of bioinformatics algorithms through coding and research": $2000 award for undergraduate research-based course development.

Finalist for W.D. Hamilton Award 2016: Invited talk in W.D. Hamilton Award symposium at Evolution 2016: $500 travel award from the Society for the Study of Evolution.

2016 Centennial Award for outstanding Population & Evolutionary Genetics article published in *Genetics*: for article "Adaptation, Clonal Interference, and Frequency-Dependent Interactions in a Long-Term Evolution Experiment with *Escherichia coli*"

MSU College of Natural Sciences Dissertation Completion Fellowship 2016: PhD support during final semester

NSF BEACON grant "Studying recombination in evolution experiments with long-read genome sequencing technologies" 2015: research funds, travel funds, and five months of PhD support

MSU College of Natural Sciences Dissertation Continuation Fellowship 2015: one summer of PhD support

MSU EEBB Summer Travel Fellowships 2011-2015: travel funds to present research at conferences

National Defense Science and Engineering Graduate Fellowship 2011: three years of PhD support

MSU Distinguished University Fellowship 2009: two years of PhD support

National Merit Scholar 2004

TEACHING

Research Mentor, You Lab, Duke University
2020–: Mentored one graduate student and two undergraduates on three separate research projects.

Visiting Assistant Professor, Old Dominion University
BIOL 451/551 Bioinformatics and Genomics
Fall 2019: Designed and taught a research-based undergraduate seminar on bioinformatics and genomics.

Visiting Assistant Professor, Old Dominion University
BIOL 123N/124N Biology I/II Lecture
Fall 2018-Spring 2020: taught first-year Biology to 40-90 students per semester.

Visiting Assistant Professor, Old Dominion University
BIOL 121N/122N Biology I/II Lab

Fall 2018-Spring 2019: taught laboratory sections of Introductory Biology to 30-60 students per semester.

Research Mentor, Lenski Lab
2010-2012: Mentored an undergraduate (currently postdoc at Stanford after PhD at Columbia University) in a genetic engineering research project.

Program in Undergraduate Research Learning
2010-2011: Mentored three undergraduates in computational research over three semesters.

Teaching Assistant, Michigan State University
ISB208L Applications in Biological Science Laboratory, Spring 2011

Teaching Assistant, Michigan State University
ZOL320 Developmental Biology, Fall 2010

Teaching Assistant, Brown University
CSCI0196 Algorithmic Foundations of Computational Biology, Spring 2008

SERVICE

Evolutionary Medicine Cluster Faculty Search Committee, Rutgers University 2025-2026

Biochemistry & Microbiology, Rutgers University: Microbial Biology Interview Committee 2025

Professional societies: Society for Molecular Biology and Evolution (lifetime member)
2022-2023 committee work on SMBE IDEA (Inclusion, Diversity, Equity and Access) Initiative

Biomedical Engineering, Duke University: Diversity, Equity, and Inclusion Committee 2024-2025

Ad-hoc reviewer for: *Nature Microbiology, Nature Ecology & Evolution, Nature Communications, eLife, PLOS Biology, PLOS Genetics, Genetics, Genome Research, Genome Biology and Evolution, Entropy, Genes, Journal of Theoretical Biology, Heredity, Bioinformatics, ACS Synthetic Biology, ACS Omega, mSystems, BMC Genomics, Cell Reports*