CURRICULUM VITAE

1. Daniel Michael Weinreich, Professor

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2. Home Address

Providence, Rhode Island 02903, USA

3. Education

2014 M.Sc. *ad eundem*. Brown University.

1992 – 1998 Ph.D. in Organismal and Evolutionary Biology (Richard Lewontin, advisor). Harvard University, Cambridge, Massachusetts. Thesis: *The Molecular Clock and the Evolution of OXPHOS Enzymes in Mammals.*

1978 – 1983 B.S. in Computer and Communication Science, with highest honors (John H. Holland, advisor). University of Michigan, Ann Arbor, Michigan.

4. Professional Appointments

2020 – Professor of Biology. Department of Ecology and Evolutionary Biology, and Center for Computational Molecular Biology, Brown University, Providence, RI.

2013 – 2020 Associate Professor of Biology. Department of Ecology and Evolutionary Biology, and Center for Computational Molecular Biology, Brown University, Providence, RI.

2007 – 2013 Assistant Professor of Biology. Department of Ecology and Evolutionary Biology, and Center for Computational Molecular Biology, Brown University, Providence, RI.

2004 – 2006 Postdoctoral Research Associate with Daniel L. Hartl, Organismic and Evolutionary Biology Department, Harvard University, Cambridge, MA.

2000 – 2003 NIH National Research Service Award Postdoctoral Fellow. Sponsors: Dr. Lin Chao, Department of Ecology and Evolution, University of California at San Diego and Dr. Daniel L. Hartl, Organismic and Evolutionary Biology Department, Harvard University, Cambridge, MA.

1998 – 2000 Post-doctoral Research Associate with Dr. David Rand, Department of Ecology and Evolutionary Biology, Brown University, Providence, RI.

1989 – 1992 Software Engineer, Proteon Corporation, Westborough, MA.

1983 – 1989 Software Engineer, Codex Corporation, Canton, MA.

5. Completed Publications

a. Books/Monographs

Weinreich, Daniel M. (2023) *The Foundations of Population Genetics*. MIT Press: Cambridge, Massachusetts.

b. Chapters in Books

Cruzan, Mitchell and **Daniel M. Weinreich**. (2016) *Adaptive Landscapes.* Elsevier's Reference Modules in Life Sciences, Elsevier Publishers: Amsterdam.

Cruzan, Mitchell and **Daniel M. Weinreich**. (2013) *Adaptive Landscapes.* Brenner's Encyclopedia of Genetics 2nd Edition, Elsevier Publishers: Amsterdam.

Weinreich, Daniel M. (2010) *Predicting molecular evolutionary trajectories in principle and in practice*. Encyclopedia of Life Sciences, John Wiley and Sons, Ltd: Chichester.

c. Refereed Journal Articles (Underlined names represent undergraduate collaborators)

Maya Weissman, Yevgeniy Raynes, **Daniel M. Weinreich** (accepted, 11 Dec 2024 American Naturalist) *Beyond the (geometric) mean: stochastic models undermine deterministic predictions of bet hedger evolution*.

Stamp, Julian, Alan DenAdel, **Daniel M. Weinreich** and Lorin Crawford (2023). *Leveraging the Genetic Correlation between Traits Improves the Detection of Epistasis in Genome-wide Association Studies*. Genes, Genomes and Genetics 13 (8):jkad118.

Nemati, Shahla, Abhyudai Singh , Scott D. Dhuey , Armando McDonald , **Daniel M. Weinreich**, Andreas. E. Vasdekis (2022) *Density Fluctuations, Homeostasis, and Reproduction Effects in Bacteria.* Communications Biol 5:397.

da Silva, Gabriel Monteiro, Jordan Yang, Bunlong Leang, Jessie Huang, **Daniel M. Weinreich,** Brenda M. Rubenstein (2022) *Covalent docking and molecular dynamics simulations reveal the specificity-shifting mutations Ala237Arg and Ala237Lys in TEM beta-lactamase* PLoS Computational Biology 18(6): e1009944

Jordan Yang, Nandita Naik, Jagdish Suresh Patel, Christopher S. Wylie, Wenze Gu, Jessie Huang, F. Marty Ytreberg, Mandar T. Naik, **Daniel M. Weinreich**, and Brenda M. Rubenstein (2020) *Predicting the viability of beta-lactamase: How folding and binding free energies correlate with beta-lactamase fitness*. PLoS One 15(5): e0233509. https://doi.org/10.1371/journal.pone.0233509

Raynes, Yevgeniy and **Daniel M. Weinreich** (2019) *Selection on mutators is not frequency-dependent*. eLife 8:e51177 DOI: 10.7554/eLife.51177

Raynes, Yevgeniy, Paul D. Sniegowski and **Daniel M. Weinreich** (2019) *Migration promotes mutator alleles in subdivided populations*. Evolution **73**:600-608 https://doi.org/10.1111/evo.13681

Raynes, Yevgeniy and **Daniel M. Weinreich** (2018) *Genomic clustering of fitness-affecting mutations favors the evolution of chromosomal instability*. Evolutionary Applications 2018;0:1-18 DOI: 10.1111/eva.12717

Ferretti Luca, **Weinreich Daniel M**, Tajima Fumio, Achaz Guillaume (2018) *Evolutionary constraints in fitness landscapes*. Heredity 121(5):466-481. doi: 10.1038/s41437-018-0110-1.

Raynes, Yevgeniy, C. Scott Wylie, Paul D. Sniegowski, and **Daniel M. Weinreich** (2018) *Sign of selection on mutation rate modifiers depends on population size*. Proceedings of the National Academy of Sciences, USA 115(13):3422-3427 https://doi.org/10.1073/pnas.1715996115

Stover, Kristin K., **Daniel M. Weinreich**, Thomas J. Roberts and Elizabeth L. Brainerd (2018). *Patterns of musculoskeletal growth and dimensional changes associated with selection and developmental plasticity in domestic and wild strain turkeys*. Ecology and Evolution 8(6):3229-3239. DOI: 10.1002/ece3.3881

Weinreich, Daniel M., Yinghong Lan, Jacob Jaffe and Robert B. Heckendorn (2018). *The influence of higher-order epistasis on biological fitness landscape topography.* J Statistical Physics 172:208-225. DOI: 10.1007/s10955-018-1975-3

Graves, Christopher J and **Daniel M. Weinreich** (2017). *Variability in fitness effects and the limitations of fitness optimization*. Annual Review of Ecology, Evolution and Systematics 48:399-417. https://doi.org/10.1146/annurev-ecolsys-110316-022722

Knies, Jennifer, Fei Cai, and **Daniel M. Weinreich** (2017). *Enzyme efficiency, not thermostability drives cefotaxime resistance evolution in TEM-1 β-lactamase*. Molecular Biology and Evolution 34(5):1040-1054. https://doi.org/10.1093/molbev/msx053

Ferretti, Luca, Benjamin Schmiegelt, **Daniel M. Weinreich**, Atsushi Yamauchi, Yutaka Kabayashi, Fumio Tajima and Guillaume Achaz (2016) *Measuring epistasis in fitness landscapes: The correlation of fitness effects of mutations*. Journal of Theoretical Biology 396:132-143. https://doi.org/10.1016/j.jtbi.2016.01.037

Baker, Christopher W., Craig Miller, Tanayott Thaweethai, Jeffrey Yuan, Meghan Hollibaugh Baker, Paul Joyce and **Daniel M. Weinreich** (2016). *Genetically determined variation in lysis time variance in the bacteriophage φX174.* Genes, Genomes and Genetics 6:939-955. https://doi.org/10.1534/g3.115.024075

Ogbunugafor, C. Brandon, C. Scott Wylie, Ibrahim Diakite, **Daniel M. Weinreich**, and Daniel L. Hartl (2016). *Adaptive landscape by environment interactions dictate evolutionary dynamics in models of malaria drug resistance.* PLoS Genetics 12 (1): e1004710 https://doi.org/10.1371/journal.pcbi.1004710

Meini, María-Rocía, Pablo E. Tomatis, **Daniel M. Weinreich** and Alejandro J. Vila (2015) *Quantitative description of a protein fitness landscape based on molecular features.* Molecular Biology and Evolution 32 (7): 1774-1787.

Watson, Richard A., Gunter P. Wagner, Mihaela Pavicev, **Daniel M. Weinreich** and Rob Mills (2014). *The evolution of phenotypic correlations and "developmental memory."* Evolution **68**:1124 – 1138.

Weinreich, Daniel M., Yinghong Lan, Christopher S. Wylie and Robert Heckendorn (2013). *Should Evolutionary Geneticists Worry about Higher-Order Epistasis?* Current Opinion in Genetics and Development **23**(6):700-707.

Weinreich, Daniel M. and Jennifer L. Knies (2013). *Fisher's Geometric Model of Adaptation Meets the Functional Synthesis: Data on Pairwise Epistasis for Fitness Yields Insights into the Shape and Size of Phenotype Space.* Evolution **67**:2957 – 2972.

Weinreich, Daniel M., Suzanne Sindi and Richard Watson (2013). *Finding the Boundary between Evolutionary Basins of Attraction, and Implications for Wright's Fitness Landscape Analogy*. Journal of Statistical Mechanics P01001.

Liberles, David A., Sarah A. Teichmann, Ivet Bahar, Ugo Bastolla, Jesse Bloom, Erich Bornberg Bauer, Lucy J. Colwell, A.P. Jason de Koning, Nikolay V. Dokholyan, Julian Echave, Arne Elofsson, Dietlind L. Gerloff, Richard A. Goldstein, Johan A. Grahnen, Mark T. Holder, Clemens Lakner, Nicholas Lartillot, Simon C. Lovell, Gavin Naylor, Tina Perica, David D. Pollock, Tal Pupko, Lynne Regan, Andrew Roger, Nimrod Rubinstein, Eugene Shakhnovich, Kimmen Sjölander, Shamil Sunyaev, Ashley I. Teufel, Jeffrey L. Thorne, Joseph W. Thornton, **Daniel M. Weinreich**, Simon Whelan (2012). *The Interface of Protein Structure, Protein Biophysics, and Molecular Evolution* Protein Science **21**(6):769-785.

Watson, Richard A., **Daniel M. Weinreich** and John Wakeley (2010). *Genome Structure and the Benefit of Sex.* Evolution **65**:523 – 536.

O'Keefe, Kara J., Olin K. Silander, Helen McCreery, **Daniel M. Weinreich**, Kevin M. Wright, Lin Chao, Scott V. Edwards and Paul E. Turner. (2010) *Biogeography of sexual reassortment in RNA phages*. Evolution **64**:3010-3023.

Rand, David M., **Daniel M. Weinreich,** Daniel Lerman, Donna Folk and George Gilchrist (2010). *Three selections are better than one: clinal variation of thermal QTL from independent selection experiments in Drosophila*. Evolution **64**:2921 – 2934.

Christin, Pascal-Antoine, **Daniel M. Weinreich** and Guillaume Besnard (2010). *The Causes and Evolutionary Significance of Genetic Convergence.* Trends in Genetics **26**:400-405.

Brown, Kyle M., Mark A. DePristo, **Daniel M. Weinreich** and Daniel Hartl (2009). *Temporal constraints on the incorporation of regulatory mutants in evolutionary pathways.* Molecular Biology and Evolution **26**:2455-2462.

Lozovsky, Elena, Thanat Chookajorn, Kyle Brown, Mallika Imwong, Philip J. Shaw, Sumalee Kamchonwongpaisan, Daniel E. Neafsey, **Daniel M. Weinreich** and Daniel Hartl (2009). *Stepwise acquisition of pyrimethamine resistance in the malaria parasite.* PNAS 106:12015 – 12030.

DePristo, Mark A., Daniel L. Hartl and **Daniel M. Weinreich** (2007). *Mutational reversions during adaptive protein evolution*. Molecular Biology and Evolution **8**:1608-1610.

Poelwijk, Frank J., Daniel J. Kivet, **Daniel M. Weinreich** and Sander J. Tans (2007) *Empirical fitness landscapes reveal accessible paths*. Nature **445**:383-386.

Polz, Martin, Dana E. Hunt, Sarah P. Preheim and **Daniel M. Weinreich** (2006) *Patterns and mechanisms of genetic and phenotypic differentiation in marine microbes*. Phil. Trans. Roy. Soc. B **361**:2009-2021 doi 10.1098/rstb.2006.1928

Watson, Richard A., **Daniel M. Weinreich**, and John Wakeley (2006) *Effects of Intra-gene Epistasis on the Benefit of Sexual Recombination*. Biochemical Society Transactions **34**:560-561.

Weinreich, Daniel M., Nigel Delaney, Mark A. DePristo and Daniel L. Hartl (2006). *Darwinian evolution can follow only very few mutational paths to fitter proteins.* Science **312**:111-114.

Silander, Olin*, **Daniel M. Weinreich***, Kevin Wright, Kara O'Keefe, Camilla U. Rang, Paul Turner and Lin Chao (2005). *Widespread genetic exchange among terrestrial bacteriophage.* Proc. Nat. Acad. Sci. USA **102**:19009-19014.

*These authors contributed equally to this work.

Weinreich, Daniel M. (2005). *The Rank Ordering of Genotypic Fitness Values Predicts Genetic Constraint on Natural Selection on Landscapes Lacking Sign Epistasis*. Genetics **171**(3): 1397-1405.

DePristo, Mark A, **Daniel M. Weinreich** and Daniel L. Hartl (2005). *Missense meanderings through sequence space: a biophysical perspective on protein evolution*. Nature Reviews Genetics **6**(8):678-687.

Weinreich, Daniel M., Richard A. Watson and Lin Chao (2005). *Perspectives: Sign epistasis and constraint on evolutionary trajectories.* (Cover article) Evolution **59**:1165-1174.

Weinreich, Daniel M. and Lin Chao (2005). *Rapid evolutionary escape by large populations from local peaks is likely in nature*. Evolution: **59**:1175-1182.

Sheldahl, Lea, **Daniel M. Weinreich** and David M. Rand. (2003). *Recombination, dominance and selection on amino acid polymorphism in the Drosophila genome: Contrasting patterns on the X and fourth chromosomes.* Genetics **165**: 1195-1208.

Rand, David M, **Daniel M. Weinreich** and Brent O. Cezairliyan (2001). *Neutrality tests of conservative-radical amino acid changes in nuclear- and mitochondrially-encoded proteins*. Gene **261**: 115-125.

Weinreich, Daniel M. (2001). *The rates of molecular evolution in rodent and primate mitochondrial DNA.* J Molecular Evolution **52**: 40-50.

Weinreich, Daniel M. and David M. Rand (2000). *Contrasting patterns of non-neutral evolution in proteins encoded in nuclear and mitochondrial genomes.* Genetics **156:** 385-399.

Nielson, Rasmus and **Daniel M. Weinreich** (1999). *The age of nonsynonymous and synonymous mutations in animal mtDNA and implications for the mildly deleterious theory.* Genetics **153**: 497-506

d. Non-refereed Journal Articles

Weinreich, Daniel M. (2022) *Protease Inhibitors: Developing evolution-resistant drugs for COVID-19*. eLife 11:e81334.

Weinreich, Daniel M. (2021) *Herding an evolving biological population with quantum control tools.* Nature Physics **17**:17-19 10.1038/s41567-020-01050-w.

Weinreich, Daniel M. (2011) *High-throughput identification of genetic interactions in HIV-1*. Nature Genetics **43**: 398-400.

e. Book Reviews

None

f. Abstracts

Monteiro da Silva, Gabriel, Yang, Jordan, Leang, Bunlong, Huang, Jessie, **Weinreich, Daniel M**, Stiffler, Michael, Rubenstein, Brenda M.(2021) *Covalent Docking and Molecular Dynamics Simulations Reveal the Resistance-Granting Mutations A237R/K in TEM Beta-Lactamase* Biophysical Journal **120**(3):297a

Nemati, Shahla, **Daniel M. Weinreich** and Andreas E. Vasdekis (2020). *Cellular Noise and*

Response to Antibiotics. Biophysical Journal **118**(3):452a.

Lake-Bakaar, Gerrond, Linda Ruffini and **Daniel M. Weinreich**. (2002). *Ultra-rapid molecular evolution of hepatitis C virus E2-HRV1 sequences after interferon and ribavirin.* Gastroenterology **122**: 473Suppl.

g. Invited Lectures

Laboratoire Charles Coulomb, CNRS and Montpellier Université, December 17, 2024

Centre Interdisciplinaire de Recherche en Biologie, Collège de France, Paris, December 10, 2024

Institut des Sciences de l'Évolution de Montpellier, France, November 29, 2024

Génétique et Ecologie Evolutive, CNRS, Montpellier, France September 16, 2024

Society for Modeling and Theory in Population Biology, Banff International Research Station, Banff, Canada, May 23, 2024.

Earlham College, Richmond, Indiana, April 9, 2024.

Department of Ecology and Evolutionary Biology, University of California at San Diego, San Diego, California, April 5, 2024.

Centre de Biologie Structurale, CNRS Montpellier, France, June 23, 2022.

Cologne Evolution Colloquium, University of Cologne, Cologne, Germany, April 28, 2021.

LabEx Centre Méditerranéen de l'Environnement et de la Biodiversité, Montpellier, France, March 5, 2021.

Institut Henri Poincaré, Paris, France, February 4, 2021.

Lefschetz Center for Dynamical Systems, Brown University, Providence, RI, March 2, 2020.

Department of Biology and Biochemistry, University of Houston, Houston, Texas, March 29, 2019.

Green Center for Systems Biology, University of Texas Southwestern Medical Center, Dallas, Texas, March 27, 2019

Ecology and Evolutionary Biology Department, University of Chicago, January 7, 2019.

Biology Department, Boston College, Newton, MA, April 24, 2018.

Evolutionary Systems Biology Conference, Wellcome Genome Campus, Hinxton, Cambridge, UK, April 11 – 13, 2018.

Society for Molecular Biology and Evolution Annual Meeting, Austin, TX, July 2 – 6, 2017.

Biology Department, Temple University, Philadelphia, PA, April 3, 2017.

Quantitative and Systems Biology Seminar Series, University of California at Merced, Merced, CA. March 17, 2017.

Workshop on coevolution, fitness landscapes and epistasis. Muséum National d'Histoire Naturelle, Paris. March 1 – 3, 2017.

Department of Ecology and Evolutionary Biology, Yale University, New Haven, CT. September 23, 2015.

Boston Evolution Supergroup, Harvard Medical School, Boston, MA May 8, 2015.

Ecology and Evolution Graduate Program, Rutgers University, New Brunswick, NJ April 9, 2015.

Kavli Institute for Theoretical Physics, UC Santa Barbara, CA September 9, 2014.

Kavli Institute for Theoretical Physics, UC Santa Barbara, CA July 28, 2014.

First American Society for Microbiology Conference on Experimental Microbial Evolution, Washington, DC June 18 – 21, 2014.

Wilhelm und Else Heraeus-Stiftung 556. WE-Heraeus-Seminar, Bad Honnef, Germany, June 15 – 18, 2014.

Society of Molecular Biology and Evolution Annual Meeting, San Juan, Puerto Rico June 8 – 12, 2014.

American Physical Society March Meeting, Denver, CO March 3 – 7, 2014.

Microbial Systems Seminar Series, Massachusetts Institute of Technology, Cambridge, MA. May 1, 2013.

Institute for Bioinformatic and Evolutionary Studies, University of Idaho, Moscow, ID. August 9, 2012.

Department of Ecology and Evolutionary Biology, University of Pennsylvania, Philadelphia, PA. March 29, 2012.

Department of Ecology and Evolutionary Biology, Kansas University, Lawrence, KS. March 27, 2012.

Cologne Spring Meeting, University of Cologne, Cologne, Germany. February 22 - 25, 2012.

Institute for Atomic and Molecular Physics (AMOLF), Dutch Foundation for Fundamental Research on Matter (FOM), Amsterdam, The Netherlands. Feburary 20, 2012.

Department of Biochemistry and Molecular Pharmacology, University of Massachusetts Medical School, Worcester, MA. January 11, 2012.

Josephine Bay Paul Center, Marine Biological Labs, Woods Hole, MA. December 9, 2011.

European Society of Evolutionary Biologists Annual Meeting, Tübingen, Germany. August 21 – 25, 2011.

Society for the Study of Evolution Annual Meeting, Norman, Oklahoma. President's Symposium. June 18 – 21, 2011.

Santa Fe Institute, Santa Fe, NM. June 7, 2011.

Green Center for Systems Biology, University of Texas Southwestern Medical Center, Dallas, TX. May 19, 2011.

Portugaliae Genetica 14 Edition, IPATIMUP, University of Porto, Portugal. March 17 – 18, 2011.

Institute for Bioinformatic and Evolutionary Studies, University of Idaho, Moscow, ID. February 10, 2011.

Kavli Institute for Theoretical Physics Workshop on Microbial and Viral Evolution, University of California, Santa Barbara, Goleta, CA. January 4 – 21, February 14 - 25, 2011.

Quantitative Biology Graduate Program *Science at the Edge* seminar series, Michigan State University, East Lansing, MI. December 10, 2010.

Society for Industrial and Applied Mathematics, Conference on Discrete Mathematics Conference, Austin, TX, June 14 – 17, 2010.

Department of Biology, University of Nebraska, Lincoln, NE. March 4, 2010.

Department of Chemistry, Harvard University, Cambridge, MA. February 24, 2010

Aspen Center for Physics Winter Conference: Populations, Evolution and Physics. Aspen, CO. January 3 – 9, 2010.

Department of Biology, University of Rochester, Rochester, NY. December 11, 2009.

Gordon Research Conference on Microbial Population Biology, Andover, NH. July 19 – 24, 2009.

Department of Molecular and Cellular Biology and Biochemistry, Brown University, Providence, RI. Graduate Trainer Seminar. May 20, 2009.

Department of Ecology and Evolutionary Biology, State University of New York, Stony Brook,

NY. May 6, 2009.
Life Sciences Institute Eighth Annual Symposium, University of Michigan, Ann Arbor, MI. April 28, 2009
Instituto Gulbenkian de Ciência, Oeiras, Portugal. March 23, 2009.
Portugaliae Genetica 12 Edition, IPATIMUP, University of Porto, Portugal. Keynote Speaker. March 19 – 20, 2009.
Indiana University Department of Biology, Bloomington, IN. Graduate student invited speaker, January 16, 2009.
Biology New England South (BioNES) Meeting, Roger Williams University, Bristol, RI. December 2, 2008
Gordon Research Conference on Molecular Evolution, Ventura, CA. February 3 – 8, 2008.
University of Massachusetts Medical School Department of Molecular Genetics and Microbiology. Worchester, MA. November 30, 2007.
University of Washington Department of Biology. Seattle, WA. November 9, 2007.
Duke University Department of Biology. Durham, NC. Graduate student invited speaker October 25, 26, 2007.
American Society for Microbiology General Meeting, Toronto, Canada. May 21-25, 2007.
Centre d'Ecologie Fonctionnelle et Evolutive (CEFE), Centre National de la Recherche Scientifique (CNRS), Montpellier, France. May 7, 2007.
Jacques Monod Conference on Evolutionary Genomics, Roscoff, France. May 2 – 6, 2007.
Marine Biological Laboratory, Josephine Bay Paul Center, Woods Hole, MA. January 19, 2007.
New England Molecular Evolutionary Biologists Meeting, Amherst, MA. November 4, 2006.
Brown University Department of Molecular Biology, Cell Biology and Biochemistry, Providence, RI. June 13, 2006.
Brown University Center for Computational Molecular Biology, Providence, RI. March 20, 2006.
Harvard University Faculty of Arts and Sciences Systems Biology Initiative, Cambridge, MA. March 15, 2006.
Harvard Medical School Department of Microbiology and Molecular Genetics, Boston, MA. February 2, 2006.
Broad Institute of MIT and Harvard Infectious Disease Initiative, Cambridge, MA. January 5, 2006.
University of Massachusetts Department of Microbiology, Amherst, MA. November 7, 2005.
University of New Hampshire Department of Microbiology, Durham, NH. October 25, 2005.
Yale University Department of Ecology and Evolution, New Haven, CT, September 21, 2005.
Broad Institute of MIT and Harvard Medical Population Genetics Group, April 28, 2005.
University of Iowa Biology Department of Biology, Iowa City, IA. January 13, 2005.
University of North Carolina Department of Biology, Chapel Hill, NC. March 26, 2004.
University of Albany, SUNY Department of Biology, Albany, NY. February 26, 2002.
University of California Department of Evolution and Ecology, Davis. Davis, CA May 15, 2001.

h. Papers Read

None

i. Works in Review and Revision

Maya Weissman, Dafeng Zhang, Rebecca Kartzinel, **Daniel M. Weinreich** (submitted 16 December 2024, American Journal of Botany) *Balancing the risks of mating: biogeographic evidence of cleistogamy as a bet hedging strategy*. https://www.biorxiv.org/content/10.1101/2024.03.28.587200v1

Daniel M. Weinreich, Thomas Sgouros, Ignacio G. Bravo, Yeveniy Raynes, Hlib Burtsev, Edison Chang, Sanyu Rajakumar, and Csenge Peták (submitted 11 January, 2025, Nature Ecology and Evolution) *The Population Genetics of Biological Noise https://www.biorxiv.org/content/10.1101/2025.01.11.632402v1*

Julian Stamp, Samuel Pattillo Smith, **Daniel Weinreich**, Lorin Crawford *Sparse modeling of interactions enables fast detection of genome-wide epistasis in biobank-scale studies https://www.biorxiv.org/content/10.1101/2025.01.11.632557v1*

j. Works in Progress

6. Research Grants

a. Current Grants

None.

b. Completed Grants

NSF Division of Environmental Biology, Evolutionary Genetics Cluster DEB-1556300 award. *Collaborative Proposal: Risk and reward of high mutation rate: why large populations favor mutators while small populations inhibit them*. Mar 1, 2016 – Feb 28, 2022. Weinreich PI $750,000 D&IC to Brown University.

NSF EPSCoR Research Infrastructure Improvement Program: Track-2 Focused EPSCoR Collaboration award 1736253: *Using biophysical protein models to map genetic variation to phenotypes*. August 1, 2017 – July 31, 2021. $6,000,000 total D&IC; $1,396,109 D&IC to Brown University. Weinreich co-PI.

NSF Research Experience for Teachers, supplement to DEB 9981497. June 1, 2017 – Feb 28, 2021. Weinreich PI $21,000 direct to Brown.

NIH R01GM095728. *Developing and Testing a Novel Geometric Model of Protein Evolution.* Sept 15, 2011 – Aug 31, 2018. Sole PI: DMW. $1,414,522.

Brown University Office of the Vice President of Research Seed Proposal: *Developing a novel, high-throughput platform to study enzyme promiscuity*. Jan 1, 2016 – June 30, 2017. $50,000 direct costs only.

NSF Award 1501355. DISSERTATION RESEARCH*: Quantitative test of evolutionary bet-hedging theory in a microbial model system*. June 1, 2015 – May 31, 2017. $21,125 Direct costs.

NSF Emerging Frontiers Award 1038657. *Inferring Biological Mechanism from Mutational Interactions.* Sept 15, 2010 – Aug 31, 2014. Sole PI: DMW. $259,079.

Brown University Salomon Faculty Research Award *The genetic basis of adaptation to novel environments in laboratory microbial populations.* Feb 1, 2008 – June 30, 2009. Sole PI: DMW. $16,000.

NIH 5RO1GM079536. *The Evolution of Malarial Antifolate Resistance.* Mar 1, 2007 – Feb 29, 2012. Author and co-investigator: DMW. PI: Dr. Daniel L. Hartl. $1,600,000.

NSF Population Biology DEB Award 0343598. *Molecular evolvability in theory and in a bacterial drug-resistance gene.* Feb 1, 2004 – Jan 31, 2007. Author and Co-investigator: DMW PI: Dr. Daniel L. Hartl. $236,000.

NIH National Research Service Award F32 GM20736. *Molecular evolution in the bacteriophage* ϕ6 Aug 1, 2000 – Jul 31, 2003. Sole PI: DMW. $109,164

NSF Population Biology DEB Award 9981497. *Recombination, dominance, and selection on amino acid mutations*. Mar 1, 2000 – Feb 28, 2002. Co-author and co-investigator: DMW PI: Dr. David Rand. $172,367

NIH National Research Service Award *Animal mtDNA and a novel model of molecular evolution*. Awarded Jul 1998; declined. Sole PI: DMW. $79,312.

NSF Doctoral Dissertation Improvement Grant Award DEB-97000982. Oct 1, 1997 – June 1, 1998. Sole PI: DMW. $7,940.

Harvard University Department of Organismic and Evolutionary Biology Departmental Student Research Grant. Jan 1, 1997. Sole PI: DMW. $3,500.

NIH Genetics Training Grant GM07620. PI: Nancy Kleckner. Sept 1, 1992 – Aug 31, 1997.

c. Proposals Submitted but not funded

Templeton Foundation *The evolution of genes that determine the fidelity of information transmission.* Submitted Aug 16, 2019, $953,127 Direct costs; $478,756 direct to Brown. Weinreich: PI. Declined.

NIGMS RM1 *The phenotypic consequences of genetic interactions at multiple genomic scales*. Submitted Jan 25, 2018, $ 6,992,295.37 D&IC to Brown. Weinreich: MPI. Declined.

NIGMS RM1 *The phenotypic consequences of genetic interactions at multiple genomic scales*. Submitted May 25, 2018, $7,221,561.27 D&IC to Brown. Weinreich: MPI. Declined.

NSF-Simons Research Centers for Mathematics of Complex Biological Systems *Biological Organization in Time and Space: A Center for the Mathematical Biosciences at Brown University*. Submitted September 29, 2017 $9,942,395 D&IC to Brown. Weinreich Senior Personnel. Declined.

NSF *NRT-DESE Training data-enabled scientists in industry engineering practices: applications to evolutionary genomics*. Submitted February 9, 2016 $2,999,524 D&IC to Brown. Weinreich co-PI. Declined.

Human Frontiers in Science Program *Using Learning Theory to Understand How Phenotypic Plasticity 'Teaches' Genomes to Evolve*. Letter of Intent submitted Mar 31, 2015. Full proposal submitted Sept 14, 2015 $1,350,000 D&IC Weinreich co-PI $394,465 to Brown University. Declined.

NSF Division of Environmental Biology, Evolutionary Genetics Cluster. *Preliminary Proposal: Survival of the roundest: why occupied fitness peaks are domes and not volcanoes.* Weinreich PI Preliminary proposal submitted Jan 20, 2015. Full proposal submitted Aug 1,

2015 $807,314 D&C. Declined.

Brown University Office of the Vice President of Research Salomon Proposal: *Examining the evolutionary dynamics of adaptation in changing environments.* Submitted Nov. 3, 2014. $14,778 direct costs only. Declined.

NIH National Cancer Institute R21 Proposal: *A novel microbial model system to study the evolution of chromosomal instability*. Submitted Feb. 27, 2014 $415,098 D&IC. Declined.

NSF Division of Environmental Biology, Evolutionary Genetics Cluster. *Preliminary Proposal: Generalized mutator evolution and the evolution of stress resistance in asexual genomes.* Submitted January 17, 2014. Declined.

NSF Division of Environmental Biology, Evolutionary Genetics Cluster. *Preliminary Proposal: Beyond SNP-based models of protein evolution: Testing the epistatic consequences of protein folding.* Submitted January 21, 2014. Declined

Joint DMS/NIGMS Initiative to Support Research at the Interface of the Biological and Mathematical Sciences. *Integrating Molecular Evolution and Molecular Biophysics*. Submitted September 23, 2013. Declined.

NSF Division of Environmental Biology, Evolutionary Genetics Cluster. *Preliminary Proposal: Experimental Test of Life History Effects on Fixation Probabilities*. Submitted January 23, 2013 with Christina Burch, University of North Carolina. Declined

NSF Division of Environmental Biology, Evolutionary Genetics Cluster. *Preliminary Proposal: From Physics to Fitness: Testing the Epistatic Consequences of Protein Folding Thermodynamics*. Submitted January 21, 2013. Declined

NSF Division of Environmental Biology, Evolutionary Genetics Cluster. *Collaborative Research: Experimental Test of Life History Effects on Fixation Probabilities*. DMW Co-PI with Christina Burch, University of North Carolina. Submitted August 2, 2012. $566,535 D&IC to Brown. Declined.

NSF Division of Environmental Biology, Evolutionary Genetics Cluster. *Developing and Testing a Novel Geometric Model of Protein Evolution*. Submitted July 9, 2009. Sole PI: DMW. $427,551. Declined.

NSF Division of Biology, Population and Evolutionary Processes Cluster. *The Genetics of Adaptation: Inferring Shared Pleiotropy from Mutational Epistasis in Theory and in Two Experimental Systems*. Submitted July 9, 2008. Sole PI: DMW. $597,529. Declined.

Brown University SEED Proposal. *Understanding Bacterial Survival to Enhance Antibiotics Development*. Submitted December 4, 2007. Co-PI: DMW. $25,000 to DMW. Declined.

NSF Division of Mathematical Sciences, Mathematical Biology Cluster. *The Combinatorics of Molecular Evolution*. Submitted Oct 1, 2007. Sole PI: DMW. $361,396. Declined.

Arnold and Mabel Beckman Foundation, Beckman Young Investigator Proposal. *The Combinatoric, Mechanistic Dissection of Taxol Resistance Evolution.* Submitted September 27, 2007. Sole PI: DMW. Declined.

NSF Emerging Frontiers in Theoretical Biology. *Epistasis, Evolutionary Trajectories and the Permutahedron*. Submitted July 3, 2007. Sole PI: DMW. $366,649. Declined.

NSF Frontiers in Integrative Biology. *FIBR: How Do Microevolutionary Processes Determine the Organization of Genetic and Phenotypic Diversity of Bacteria in Space and Time?* Submitted February 16, 2007. Co-PI: DMW. PI: Martin Polz (MIT). $293,641 to Brown. Declined.

David and Lucille Packard Fellowship for Science and Engineering. Submitted February 6, 2007.

Sole PI: DMW. Declined.

NSF Division of Biology, Population and Evolutionary Processes Cluster. *The Systems Biology of β-lactamase*. Submitted July 9, 2006. Sole PI: DMW. $454,676. Declined.

7. Service

a. To the University

2023 –	Vice Chair, Department of Ecology, Evolutionary and Organismal Biology
2022 – 2024	Direct, Center for Computational Molecular Biology
2022 –	Data Science Initiative Executive Committee member
2020	*Ad hoc* Investigation Committee member, Office of Research Integrity
2018 – 2019	Interim Director, Center for Computational Molecular Biology
2018 – 2019	Data Science Initiative Executive Committee member
2018	Computer Science Department Internal Review Committee member
2018 - 2019	Goldwater Scholarship Review Committee
2017 –	Office of the VP of Research, Research Advisory Board
2017 – 2020	Co-director of Graduate Studies, Center for Computational Molecular Biology
2016	Office of the VP of Research Seed Proposal reviewer
2016	Office of the VP of Research Salomon Proposal reviewer
2014 –	Division of Biology and Medicine, Space Committee
2014	Molecular Microbiology and Immunology, Search Committee
2014	Career Development Center Panelist, *Negotiating the Job Offer in the Sciences*. February 27, 2014.
2013 – 2016	Salomon Faculty Research Proposal Review Committee
2013 – 2020	Co-director of Graduate Studies, Ecology and Evolutionary Biology Department
2013	Science Center Panelist, *How to go to Graduate School in Biology* November 5, 2013.
2013	Career Development Center Panelist, *Negotiating the Job Offer in the Sciences*. February 11, 2013.
2012 – 2013	Director of Postgraduate Studies, Ecology and Evolutionary Biology Department
2012 – 2013	EEB Plant Evolutionary Biology Faculty Search Committee
2011 – 2013	Computational Biology Ph.D. Admissions Committee
2010 – 2013	First-Year, Sophomore Advisor
2010	Ecology and Evolutionary Biology Undergraduate Curriculum Committee
2010	Career Development Center Panelist, *Finding the Right Postdoc*. August 30, 2010
2009 –	Molecular, Cellular Biology and Biochemistry graduate trainer.
2009	Sheridan Center for Teaching and Learning Panelist, *Preparing for Your First Year as a Faculty Member*.
2009 – 2015	Faculty Review Board, The Triple Helix Science and Society Review (an international undergraduate-level journal of science, society, and law).
2008 – 2010	Computational Biology Ph.D. Admissions Committee
2008 – 2009	Center for Computational Molecular Biology Faculty Search Committee.
2007 – 2008	Center for Computational Molecular Biology Faculty Search Committee.

2007 – Center for Computational Molecular Biology Executive Committee.

b. To the Profession

Manuscripts reviewed for:

American Naturalist
Antimicrobial Agents and Chemotherapy
Aquatic Microbial Ecology
Biochemical Journal
BioEssays
Bioinformatics
Biology Letters
Biophysics Journal
BioSystems
BMC Evolutionary Biology
BMC Genomics
Cell
Chaos Journal
Chinese Physics B
Communications Biology
Current Biology
eLife
Evolution
Evolution: Education and Outreach
Evolution, Medicine and Public Health
FEMS Yeast Research
Genes
Genes, Genomes and Genetics
Genetics
Genome Biology
Genome Biology and Evolution
Integrative Biology
ISME Journal
Journal of Computational Biology
Journal of Evolutionary Biology
Journal of Experimental Zoology Part B: Molecular and Developmental Evolution
Journal of Molecular Biology
Journal of Molecular Evolution
Journal of Physics A: Mathematical and Theoretical
Journal of Statistical Mechanics
Journal of Statistical Physics
Journal of Theoretical Biology
mBio
Microbiology and Molecular Biology Letters
Molecular Biology and Evolution
Molecular Ecology
Nature
Nature Biotechnology
Nature Communications
Nature Ecology and Evolution
Nature Genetics
Nature Physics
Nature Reviews Genetics
Nature Reviews Molecular Cell Biology
Nature Structural Biology
Peer Community in (PCI) Evolutionary Biology
Philosophical Transactions of the Royal Society, B
PLoS Computational Biology
PLoS Genetics
PLoS One
PLoS Pathogens
Proceedings of the National Academy of Sciences, USA
Proceedings of the Royal Society, B
PRX Life
Quarterly Review of Biology
Science
Scientific Research and Essays
Statistica Sinica
Theoretical Population Biology
Trends in Ecology and Evolution
Trends in Genetics

Associate Editor for:

Genetics 2014 – 2024

Guest Associate Editor for:
- eLife
- G3: Genes|Genomes|Genetics
- PLoS Computational Biology
- PLoS Genetics
- Proceedings of the National Academy of Science, USA

Ad hoc Grant Reviewer:
- Australian Research Foundation (ARC)
- Austrian Science Fund (FWF)
- Canadian Foundation for Innovation (CFI)
- European Research Council (ERC)
- Human Frontiers Science Program (HFSP)
- National Sciences and Engineering Research Council of Canada (NSERC)
- Netherlands Organization for Scientific Research (NWO)
- NSF Population Biology cluster, Division of Environmental Biology
- NSF Cellular Systems Cluster, Molecular and Cellular Biosciences
- NSF Genes and Genomes Cluster, Molecular and Cellular Biosciences
- Swiss National Science Foundation (SNSF)
- John Templeton Foundation
- University of Houston Grants to Advance Research (GEAR)
- US Army Research Office (ARO)

Panel Member for:
- NSF Evolutionary Processes cluster, Division of Environmental Biology
- NIH Center for Scientific Review, Genes, Genomes and Genetics Group

Member:
- Faculty of 1000, Evolutionary & Comparative Genetics section in Genomics & Genetics

Invited Workshops
- National Evolutionary Synthesis Center, Durham, NC. October 18 – 21, 2011. *Modeling protein structural and energetic constraints on sequence evolution.*
- University of California, Santa Barbara Kavli Institute for Theoretical Physics, Goleta, CA. January 4 – January 21, February 14 – 26, 2011. *Microbial and Viral Evolution.*
- Pennsylvania State University, Center for Infectious Disease Dynamics, State College, PA. July 17, 2008. *Virus adaptation on multi-host fitness landscapes*.

Workshops and Symposia Organized
- Third International Congress on Evolutionary Biology, Montréal, Canada, July 26 – 30, 2024. *The Evolution of Biological Noise*
- Kavli Institute for Theoretical Physics, UC Santa Barbara, Goleta, CA. July 21 – September

19, 2014. *Evolution of Drug Resistance*.

Public Outreach

Kavli Institute for Theoretical Physics Chalktalk, UC Santa Barbara, Goleta, CA. July 29, 2014.

Public screening of the film *Resistance*, New Vic Theater, Santa Barbara, CA. August 12, 2014.

Panelist, *The Science Museum of the Future,* Association for Science-Technology Centers Annual Conference, Raleigh, NC. October 20, 2014.

Political Lobbying

Coalition for Nation Science Funding, 16th Annual Capitol Hill Exhibition, Washington, DC April 14, 2010.

Visiting Scholars

Bo Liu, Qilu University of Technology in China, September 2014 – February 2015.

Yifei Wang, University of Bath, June – July 2014.

Raquel García Pérez, Fundación Caja Madrid Fellowship, September 2012 – August 2013.

Formal junior faculty mentees

Carsten Eickhoff (Center for Biomedical Informatics, Department of Computer Science, Brown University)

Amanda Jaimeson (Department of Molecular and Microbial Immunology, Brown University)

Craig Miller (Department of Biological Sciences, University of Idaho)

Mandar Naik (Department of Molecular Pharmacology, Physiology and Biotechnology, Brown University)

Brandon Ogbunu (Department of Ecology and Evolutionary Biology, Brown University)

Paul Rowley (Department of Biological Sciences, University of Idaho)

Andreas Vasdekis (Department of Physics, University of Idaho)

Habilitation à diriger des Recherches jury

Guillaume Martin, Université de Montpellier (2021)

c. To the Community

2022 – Biotechnology Advisory Board Member, Woonsocket Area Career and Technical Center, Woonsocket, Rhode Island.

2018 Mentored one Providence Public School High School science teacher summer lab interns under NSF Research Experience for Teachers supplemental funding

2017 Mentored two Providence Public School High School science teacher summer lab interns under NSF Research Experience for Teachers supplemental funding

2016 Workshop entitled *Evolutionary Genetics in Action* for Brown University SPARK Summer program for Middle School students, July 6, 2016

2016 Mentored one student from Woonsocket High School

2015	Lecture to Brown University SPARK Summer program for Middle School students, July 16, 2015
2015	Mentored one student from Woonsocket High School
2014	Mentored one high school student from St. Paul's School, London, UK.
2013	Mentored two high school students from Woonsocket High School.
2012 – 2014	Mentored one high school student from Mount Saint Charles Academy, Woonsocket, RI
2012	Presented at Vartan Gregorian Elementary School Science Conference, Providence, RI
2011	Mentored one Providence High School teacher in the lab
2010	Mentored two Providence Public School teachers in the lab
2009	Mentored two Providence Public High School students in the lab
2008	Mentored three Providence Public High School students in the lab

8. Academic Honors

2021 – 2024	Royce Family Professor of Teaching Excellence in Biology
2011	Brown University Center for Computational Molecular Biology Sabbatical Seed Award
2010	Brown University Center for Computational Molecular Biology Travel Award
2009	Brown University Center for Computational Molecular Biology Seed Award
2008, 2009	Brown University NSF/EPSCoR Proteomics Instrumentation Use Award
2008	Brown University Center for Computational Molecular Biology Teaching Award
2008	Brown University Salomon Faculty Research Award.
2007	Brown University Center for Computational Molecular Biology Scholarship Innovator Award.

9. Teaching

Fall 2023	Biol 0380 *The Ecology and Evolution of Infectious Disease*, Brown University. Enrollment: 97 Biol 1430 *The Foundations of Population Genetics*, Brown University. Enrollment: 32.
Fall 2022	Univ 0450 *We Live in Interesting Times: The Long Reach of the COVID-19 Pandemic*, Brown University. Enrollment: 62.
Fall 2021	Biol 0380 *The Ecology and Evolution of Infectious Disease*, Brown University. Enrollment: 53 BIOL 1430 *The Foundations of Population Genetics*, Brown University. Enrollment: 19
Fall 2020	Biol 0380 *The Ecology and Evolution of Infectious Disease*, Brown University. Enrollment: 83
Spring 2020	BIOL 2440 S02 *The evolution of evolvability*, Brown University. Enrollment: 7.
Fall 2019	BIOL 0380 *The Ecology and Evolution of Infectious Disease*, Brown University. Enrollment: 71

BIOL 1430 *Population Genetics*. Brown University. Enrollment 36

Spring 2019 BIOL 1960 *Directed Research/Independent Study*, Brown University. Enrollment: 1

Fall 2018 BIOL 0380 *The Ecology and Evolution of Infectious Disease*, Brown University Enrollment: 50

BIOL 1950 *Directed Research*/*Independent Study*, Brown University. Enrollment: 2

Spring 2018 BIOL 1960 *Directed Research/Independent Study*, Brown University. Enrollment: 1

Fall 2017 BIOL 0380 *The Ecology and Evolution of Infectious Disease*. Brown University. Enrollment 45

BIOL 1430 *Population Genetics*. Brown University. Enrollment 21

BIOL 2430 S01 *Topics in Ecology and Evolutionary Biology: Professional Development*. Enrollment 3

Spring 2017 BIOL 1960 *Directed Research/Independent Study*, Brown University. Enrollment: 6.

BIOL 2440 S04 *Topics in Ecology and Evolutionary Biology: Foundations of Ecology and Evolution*, Brown University. Enrollment: 6.

Fall 2016 BIOL 0380 *The Ecology and Evolution of Infectious Disease*. Brown University. Enrollment: 22.

BIOL 1950 *Directed Research/Independent Study,* Brown University. Enrollment: 5.

BIOL 2430 S03 *Topics in Ecology and Evolutionary Biology: Professional Development*, Brown University. Enrollment: 6.

Spring 2016 BIOL 1960 *Directed Research/Independent Study,* Brown University. Enrollment: 1.

Fall 2015 BIOL 0380 *The Ecology and Evolution of Infectious Disease*. Brown University. Enrollment: 16.

BIOL 1430 *Computational Theory of Molecular Evolution: Population Genetics*. Brown University. Enrollment 17

BIOL 1950 *Directed Research/Independent Study,* Brown University. Enrollment: 2.

BIOL 2430 S03 *Topics in Ecology and Evolutionary Biology: Professional Development*, Brown University. Enrollment: 9.

Spring 2015 BIOL 1960 *Directed Research/Independent Study,* Brown University. Enrollment: 2.

Fall 2014 BIOL 0370 *Experimental Evolution: Seeing Darwin in Real Time*. Brown University. Enrollment: 9 + 2 auditors.

BIOL 1950 *Directed Research/Independent Study*, Brown University. Enrollment: 2.

BIOL 2440 *Topics in Ecology and Evolutionary Biology: Professional Development*, Brown University. Enrollment: 4.

BIOL 2980 *Graduate Independent Study*. Enrollment 2.

Fall 2013 BIOL 0380 *The Ecology and Evolution of Infectious Disease*. Brown University.

Enrollment: 13.
BIOL 1430 *Computational Theory of Molecular Evolution*. Brown University. Enrollment 16
BIOL 1950 *Directed Research/Independent Study*, Brown University. Enrollment: 1.
BIOL 2980 *Graduate Independent Study*. Enrollment 2.

Spring 2013 BIOL 1960 *Directed Research/Independent Study*, Brown University. Enrollment: 5.
BIOL 2440 *Topics in Ecology and Evolutionary Biology: Beyond Classical Population Genetics, Brown University*. Enrollment: 6.
BIOL 2980 *Graduate Independent Study*, Brown University. Enrollment: 2.

Fall 2012 BIOL 0380 *Ecology and Evolution of Infectious Disease*, Brown University. Enrollment: 19.
BIOL 1950: *Directed Research/Independent Study*, Brown University. Enrollment: 6
BIOL 2980 *Graduate Independent Study*, Brown University. Enrollment: 2.

Spring 2012 BIOL 1430 *Computational Theory of Molecular Evolution*, Brown University. Enrollment: 36.
BIOL 1960 *Directed Research/Independent Study*, Brown University. Enrollment: 6.
BIOL 2980 *Graduate Independent Study*, Brown University. Enrollment: 1.

Fall 2011 BIOL 0380 *Ecology and Evolution of Infectious Disease*, Brown University. Enrolment: 24.
BIOL 1950 *Directed Research/Independent Study*, Brown University. Enrollment: 4.
BIOL 2980 *Graduate Independent Study*, Brown University. Enrollment: 1.

Spring 2011 BIOL 1960 *Directed Research/Independent Study*, Brown University. Enrollment: 3.

Fall 2010 BIOL 0380 *Ecology and Evolution of Infectious Disease*, Brown University. Enrollment: 23.
BIOL 1950 *Directed Research/Independent Study*, Brown University. Enrollment: 1.
BIOL 2980 *Graduate Independent Study*, Brown University. Enrollment: 1.

Spring 2010 BIOL 1960 *Directed Research/Independent Study*, Brown University. Enrollment: 1.
BIOL 2980 *Graduate Independent Study*, Brown University. Enrollment: 2.

Fall 2009 BIOL 0380 *Ecology and Evolution of Infectious Disease*, Brown University. Enrollment: 21.
BIOL 1950 *Directed Research/Independent Study*, Brown University. Enrollment: 1.
BIOL 2980 *Graduate Independent Study*, Brown University. Enrollment: 2.

Spring 2009 BIOL 1430 *Computational Theory of Molecular Evolution*, Brown University. Enrollment: 35.
BIOL 1960 *Directed Research/Independent Study*, Brown University. Enrollment:

1.
BIOL 2980 *Graduate Independent Study*, Brown University. Enrollment: 1.

Fall 2008 BIOL 0380 *Ecology and Evolution of Infectious Disease*, Brown University. Enrollment: 23
BIOL 1950 *Directed Research/Independent Study*, Brown University. Enrollment: 3.
BIOL 2980 *Graduate Independent Study*, Brown University. Enrollment: 1.

Spring 2008 BIO 1960 *Directed Research/Independent Study*, Brown University. Enrollment: 6.

Fall 2007 BIO 1950 *Directed Research/Independent Study*, Brown University. Enrollment: 4.
Minicourse: Genetic Interactions: Principles, Measurement and Interpretation, Department of Integrative Developmental Biology, Harvard Medical School. Participants: 40.

Spring 2007 BI 0143 *Computational Theory of Molecular Evolution*, Brown University. Enrollment: 30.

Fall 2003 Teaching Fellow, BS50 *Genetics and Genomics* (W. Gelbart and W. Fixsen), Harvard University.

Fall 1997 Teaching Fellow, Bio 153 *Population Genetics* (R.C. Lewontin, D. L. Hartl), Harvard University. Developed and taught independent syllabus on molecular population genetics.

Spring 1997 Teaching Fellow, BS14 *Genetics* (D. L. Hartl), Harvard University.

Fall 1992 Teaching Fellow, *Introduction to Organismic and Evolutionary Biology* (K. Liem), Harvard University.

Fall 1979 Teaching Assistant, *Physics II (E&M)*, University of Michigan.

Postdoctoral Fellows

Chintan Modi July 2014 – 2016.
Yeveniy Raynes July 2012 – 2021.
C. Scott Wylie February 2012 – March 2016. Left Brown to join Insight Data Science.
Jennifer Lynn Knies August 2007 – September 2011. Left Brown to assume faculty appointment at Christopher Newport University effective January, 2012. Tenured January 2019.

Ph.D. Students

Julian Stamp (Brown Computational Biology) 2021 –
Meredith Miles (Brown EEB) 2020
Maya Weissman (Brown EEB) 2019 – 2024
David Morgan (Brown EEB) 2018 – 2022
Yinghong Lan (Brown EEB) 2012 – 2018
Christopher Graves (Brown EEB) 2011 – 2017
Angus Angermeyer (Brown/MBL, coadvised with Julie Huber) 2009 – 2017

Ph.D. Rotation Students

Kaylee Matthews (Brown MCB) 2017

Graduate Committees

Jocelyne Chavez (Brown EEOB) 2023 –
Leah Darwin (Brown EEOB) 2023 –
Jacob Marglous (Brown Computational Biology) 2023 –
David Peede (Brown EEOB) 2021 –
Elizabeth Gibson Chevy (Brown Computational Biology) 2020 –
Cole Williams (Brown Computational Biology) 2020 –
Laura Steiner (University of Idaho Department of Biological Sciences) 2019 – 2021
Kaileigh Ahlquist (Brown MCB) 2018 – 2022
Benjamin Korry (Brown MMI) 2018 – 2022
Aislinn Rowan-Nash (Brown MMI) 2018 - 2019
Hannah Weller (Brown EEB) 2018 –
Kelsey Schuch (Brown MCB) 2018 –
Kamil Cygan (Brown CCMB) 2017 – 2018
Kimberly Cohen Neil (Brown EEB) 2017 – 2020
Bianca Brown (Brown EEB) 2014 – 2021
Lillian Hancock (Brown EEB) 2014 – 2018
Alger Fredericks (Brown MCB) 2014 – 2019
Stephen Rong (Brown CCMB) 2014 – 2020
Kristin Stover (Brown EEB) 2014 – 2017
Alfred Simkin (University of Massachusetts Medical School, Graduate School of Biomedical Sciences) 2014
Priyanka Nakka (Brown CCMB) 2013 – 2018
Yinghong Lan (Brown EEB) 2012 – 2018
Christopher Graves (Brown EEB) 2011 – 2017
Rebecca Helm (Brown EEB) 2009 – 2015
John Cumbers (Brown MCB) 2009 – 2011
Patrick Flight (Brown EEB) 2007 – 2011
Alan Bergland (Brown EEB) 2007 - 2010
Sarah Pacocha Preheim (MIT, Civil and Environmental Engineering) 2006 - 2009
Robert Haney (Brown EEB) 2007
Martine Zilversmit (Harvard University, Organismal and Evolutionary Biology) 2007

Conseil de suivi

2021 – Michael Finnegan, Université de Montpellier

Thesis rapporteur

Fanni Borvető (University of Montpellier) 2021

Masters Students

Robin Zelman 2009 – 2010.

Undergraduate Theses Supervised

Neal Yin 2024 “Adaptive significance of amphicarpy as a bet-hedging strategy in American hog-peanut”

Jacob Marglous 2021 “In the Driver’s Seat: Counterdiabatic Driving to Optimize Bacterial Infection and Cancer Treatments”

Gabrielle Ferra 2020 “A Walsh Framework to Study the Effects of Marginal Epistasis and Sampling Biases in Genetic Association Studies”

Ryan Bronson 2019 “A Stochastic Simulation for Evolution in a Changing Environment: Understanding Pyrimethamine Resistance in Plasmodium falciparum.”

Chibuikem Nwizu 2017 “Evolutionary Stabilization of Microbial Genomes and Mutation Rates in Variable Environments”

Jacob Jaffe 2017 “Identifying the Importance of Higher-Order Epistasis”

Sovijja Pou 2017 “Modeling the Evolution of Antimalarial Drug Resistance for Clinically Realistic Pharmacokinetics”

Amanda Zajac 2017 “Indirect Mutational Pathways to Population Fitness”

Dylan Spangle 2016 “Photosynthesis Can Be Optimized to Feed and Fuel the World: Evolutionary Challenges and Engineering Possibilities”

Natasha Nguyen 2015 “Survival Of The Stablest? Correlating Fitness With Biophysical Stability”

Alexandra Brown 2013 “The Effect of Variance in Time to Lysis on the Malthusian Growth Rate of Lytic Bacteriophage in a Two-Stage Chemostat“

Lei Ma 2013 “The microbiome composition of a shelter building moth and implications for defense against parasitoid”

Tanayott Thaweethai 2013 “Evolutionary Opportunities for Horizontal Transmission of Antibiotic Resistance Across Bacterial Species”

Jonathan Kang 2012 “Thermal persistence in *E.* coli and the heat shock response”

Christopher Baker 2012 “Estimating the Influence of Mutations on Phage Life Histories Using a Single-Phage Assay“

Jeffrey Yuan 2011 “Characterization of Phage Fitness through Single-Phage Assays”

Stephanie Spielman 2010 “Evolutionary Constraints on CRISPR Repeats with Conserved Secondary Structure”

Robin Zelman 2009 “Effects of Drug Concentration on Persistence in *Escherichia coli*

Glenn Scheinberg 2008 “Examination of single peaked landscapes *in silico* using the permutahedron”

Rohan Maddamsetti 2008 “The Effects of Standing Genetic Variation on Adaptation to Novel Environments”

Funded Undergraduate Summer Research Assistantships Supervised

Neal Yin (Brown Caleel Fellowship) 2023

Brynn Miller (Brown Undergraduate Teaching and Research Award) 2023

Sameh Alam (Brown Undergraduate Teaching and Research Award) 2023

Kate Choi (Brown Undergraduate Teaching and Research Award) 2023

Hayden Sisemore (Brown Undergraduate Teaching and Research Award) 2023

Neal Yin (Brown Undergraduate Teaching and Research Award) 2022

Anwen Lin (Brown Summer Research Assistantship) 2022
Ryan Bronson (Brown Undergraduate Teaching and Research Award) 2018
Akpiroro Oshobe (Brown Undergraduate Teaching and Research Award) 2017
Jacob Jaffe (Brown Undergraduate Teaching and Research Award) 2016
Sovijja Pou (Brown Program in Liberal Education Student Research Award) 2016
Chibuikem Nwizu (Brown Undergraduate Teaching and Research Award) 2015
Sovijja Pou (Brown University Teaching and Research Award) 2015
Dylan Spangle (Brown University Teaching and Research Award) 2015
Natasha Nguyen (Brown Program in Liberal Medical Education Summer Research Assistantship) 2013
Lei Ma (Brown Undergraduate Teaching and Research Award) 2012
Alexander Tran (Brown Program in Liberal Medical Education Summer Research Assistantship) 2012
Nicole Damari (Brown Undergraduate Teaching and Research Award) 2011
Ayoosh Pareek (Brown Undergraduate Teaching and Research Award) 2011
Jonathan Kang (Brown Undergraduate Teaching and Research Award) 2011
Matthew Weisberg (Brown Undergraduate Applied Math/Biology Award) 2011
Hans Gao (Brown Program in Liberal Medical Education Summer Research Assistantship) 2011
Jeffrey Yuan (Brown Undergraduate Applied Math/Biology Award) 2010
Stephanie Spielman (Brown Undergraduate Teaching and Research Award) 2009
Max Abrahams (Brown Undergraduate Applied Math/Biology Award) 2009
Jamieson Mellor (EPSCoR SURF Award) 2009
Jacob Johnson (Brown Undergraduate Teaching and Research Award) 2008
Alexander Franks (Brown Undergraduate Teaching and Research Award) 2007

Undergraduate Advising

2013 –	Concentration Advisor (Applied Math/Biology, Computational Biology, Health and Human Biology)
2013 – 2014	First-years (4), Sophomores (4)
2012 – 2013	First-years (5), Sophomores (5)
2011 – 2012	First-years (4), Sophomores (5)
2010 – 2011	First-years (5)