Joshua S. Rest
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Curriculum Vitae January 2024

Appointment

Associate Professor (2014-), Department of Ecology and Evolution, Stony Brook University.
Associate Member, Laufer Center for Physical and Quantitative Biology
Graduate Program Director, Ecology and Evolution Ph.D. Program
Assistant Professor (2008-2014), Department of Ecology and Evolution, Stony Brook University.

Professional Preparation

University of Chicago	Ecology & Evolution	Postdoctoral Fellow	2004-2008
University of Michigan	Ecology & Evolution	Ph.D.	2004
Drake University	Biology	B.S. *summa cum laude*	1999

Peer-reviewed Publications

Number of times these articles have been cited: 3786 (https://scholar.google.com/citations?user=vXR2PPwAAAAJ)

34. Collier, J.L.*, J.S. Rest*, L. Gallot-Lavallée, E. Lavington, A. Kuo, J. Jenkins, C. Plott, J. Pangilinan, C. Daum, I.V. Grigoriev, G.V. Filloramo, A. Vanclova, J.M. Archibald. 2023. The protist *Aurantiochytrium* has universal subtelomeric rDNAs and is a host for mirusviruses. *Current Biology*, 33(23), pp.5199-5207.
    *Co-corresponding authors, Contributed equally

    Coverage in the press: *Times Beacon Record,* Phys.org, DeeperBlue.com

33. Rius, M., J.S. Rest, G.V. Filloramo, A.M.G. Novák Vanclová, J.M. Archibald, J.L. Collier. 2023. Horizontal gene transfer and fusion spread carotenogenesis among diverse heterotrophic protists. *Genome Biology and Evolution*, 15 (3); https://doi.org/10.1093/gbe/evad029.
32. O'Hara, N.B., S.J. Franks, N.C. Kane, S. Tittes, J.S. Rest. 2021. Evolution of pathogen response genes associated with increased disease susceptibility during adaptation to an extreme drought in a *Brassica rapa* plant population. *BMC Ecology and Evolution* 21 (1), 1-11.
31. Hamann, E., C.S. Pauli, Z. Joly-Lopez, S.C. Groen, J.S. Rest, N.C. Kane, M.D. Purugganan, S.J. Franks. 2020. Rapid evolutionary changes in gene expression in response to climate fluctuations. *Molecular Ecology* 30 (1): 193-206.
30. Faktorová D., ... (112 authors including J.S. Rest)... J. Lukeš. 2020. Genetic tool development in marine protists: Emerging model organisms for experimental cell biology. *Nature Methods* 2020:1-14.
29. Collier, J.A., J.S. Rest. 2019. Swimming, gliding and rolling toward the mainstream: cell biology of marine protists. *Molecular Biology of the Cell* 30(11): 1245-1248.

28. Hanson, S. M., G. Georghiou, M.K. Thakur, W.T. Miller, J.S. Rest, J.D. Chodera, M.A. Seeliger. 2019. What makes a kinase promiscuous for inhibitors? *Cell Chemical Biology* 26(3): 390-399.e5
27. Cai, L. , Z. Xi, A. M. Amorim, M. Sugumaran, J.S. Rest, L. Liu, C.C. Davis. 2018. Widespread ancient whole-genome duplications in Malpighiales coincide with Eocene global climatic upheaval. *New Phytologist* doi:10.1111/nph.15357
26. Franks, S.J., N.C. Kane, N.B. O'Hara, S. Tittes, J.S. Rest. 2016. Rapid genome-wide evolution in *Brassica rapa* populations following drought revealed by sequencing of ancestral and descendent gene pools. *Molecular Ecology* 25: 2622-3631.

Coverage in the press: *The Molecular Ecologist*, *Popular Science,* and *Huffington Post*. Highlighted in a Perspectives article in *Molecular Ecology.*

25. Rest, J.S., O. Wilkins, W. Yuan, M. Purugganan, J. Gurevitch. 2016. Meta-analysis and meta-regression of transcriptomic response to water stress in Arabidopsis. *The Plant Journal* 85: 548-560.
24. O'Hara, N.B., J.S. Rest, S.J. Franks. 2015. Increased susceptibility to fungal disease accompanies adaptation to drought in *Brassica rapa. Evolution* 70(1): 241-248.
23. O'Hara, N.B., J.S. Rest, S.J. Franks. 2016. Factors affecting the disease severity of Alternaria blackspot in natural *Brassica rapa* populations on the California and Oregon coasts. *Madroño* 63: 249-257.
22. Xi, Z., L. Liu, J.S. Rest, C.C. Davis. 2014. Coalescent versus concatenation methods and the placement of Amborella as sister to water lilies. *Systematic Biology* 63(6): 919-932.
21. Martinez, C.A., J.S. Rest, A-R. Kim, M.Z. Ludwig, M. Kreitman, K.P. White, J. Reinitz. 2014. Ancestral resurrection of the Drosophila S2E enhancer reveals accessible evolutionary paths through compensatory change. *Molecular Biology and Evolution* 31(4): 903-916.
20. Opulente D.A., C.M. Morales, L.B. Carey, J.S. Rest. 2013. Coevolution trumps pleiotropy: Carbon assimilation traits are independent of metabolic network structure in budding yeast. *PLOS One* 8(1): e54403.
19. Rest J.S., C.M. Morales, J.B. Waldron, D.A. Opulente, J. Fisher, S. Moon, K. Bullaughey, L. Carey, D. Dedousis. 2013. Nonlinear fitness consequences of variation in expression level of a eukaryotic gene. *Molecular Biology and Evolution* 30(2): 448-56.
18. Xi, Z., J.S. Rest, C.C. Davis. 2013. Phylogenomics and coalescent analyses resolve extant seed plant relationships. *PLOS One* 8(11): e80870.
17. Xi, Z., Y. Wang, R.K. Bradley, M. Sugumaran, C.J. Marx, J.S. Rest, C.C. Davis. 2013. Massive mitochondrial gene transfer in a parasitic flowering plant clade. *PLOS Genetics* 9(2): e1003265.
16. Xi, Z., R.K. Bradley, K.J. Wurdack, K.M. Wong, M. Sugumaran, K. Bomblies, J.S. Rest*, C.C. Davis. 2012. Horizontal transfer of expressed genes in a parasitic flowering plant. *BMC Genomics* 13: 227.
*Co-corresponding author.

Highly accessed article, coverage in the press: *The Economist, Scientific American, Times Beacon Record, Daily Mail, Washington Post,* and *Harvard Gazette.*

15. Rest, J.S., K. Bullaughey, G.P. Morris, W.H. Li. 2012. Contribution of transcription factor binding site motif variants to condition-specific gene expression patterns in budding yeast. *PLOS One* 7(2): e32274.
14. Jiang, Y., I. Lucas, D.J. Young, E.M. Davis, T. Karrison, J.S. Rest, M.M. LeBeau. 2009. Common fragile sites are characterized by histone hypoacetylation. *Human Molecular Genetics* 18: 4501-4512.
13. M.E. Bradley, J.S. Rest, W.S. Li, and N.B. Schwartz. 2009. Sulfate activation enzymes: Phylogeny and association with pyrophosphatase. *Journal of Molecular Evolution* 68: 1-13.
12. Brown, J.W., J.S. Rest, J. Garcia-Moreno, M.D. Sorenson, D.P. Mindell. 2008. Strong mitochondrial DNA support for a Cretaceous origin of modern avian lineages. *BMC Biology* 6(6).
11. Qiu, Y.-L., L. Li, B. Wang, Z. Chen, V. Knoop, M. Groth-Malonek, O. Dombrovska, J. Lee, L. Kent, J.S. Rest, G. F. Estabrook, T. A. Hendry, D. W. Taylor, C. M. Testa, M. Ambros, B. Crandall-Stotler, R. J. Duff, M. Stech, W. Frey, D. Quandt, and C. C. Davis. 2006. The deepest divergences in land plants inferred from phylogenomic evidence. *Proceedings of the National Academy of Sciences of the United States of America* 103: 15511-15516.
10. Qiu, Y.-L., O. Dombrovska, J. H. Lee, L.B. Li, B. A. Whitlock, F. Bernasconi-Quadroni, J. S. Rest, C. C. Davis, T. Borsch, K. W. Hilu, S. S. Renner, D. E. Soltis, P. S. Soltis, M. J. Zanis, J. J. Cannone, R. R. Gutell, M. Powell, V. Savolainen, L. W. Chatrou, M. W. Chase. 2005. Phylogenetic analyses of basal angiosperms based on nine plastid, mitochondrial, and nuclear genes. *International Journal of Plant Science* 166: 815-842.
9. Sun X., J.M. Fontaine, J.S. Rest, E.A. Shelden, M.J. Welsh, and R. Benndorf. 2004. Interaction of human HSP22 (HSPB8) with other small heat shock proteins. *Journal of Biological Chemistry* 279: 2394-2402.
8. Fontaine, J.M., J.S. Rest, M.J. Welsh, and R. Benndorf. 2003. The sperm outer dense fiber protein is the 10th member of the superfamily of mammalian small stress proteins. *Cell Stress and Chaperones* 8: 62-69.
7. Rest, J.S. and D.P. Mindell. 2003. SARS associated coronavirus has a recombinant polymerase and coronaviruses have a history of host-shifting. *Infection, Genetics and Evolution* 3: 219-225.
6. Rest, J.S. and D.P. Mindell. 2003. Retroids in Archaea: phylogeny and lateral origins. *Molecular Biology and Evolution* 20: 1134-1142.
5. Rest, J.S., J.C. Ast, C.C. Austin, P.J. Waddell, E.A. Tibbetts, J.M. Hay, and D.P. Mindell. 2003. Molecular systematics of primary reptilian lineages and the tuatara mitochondrial genome. *Molecular Phylogenetics and Evolution* 29: 289-297.
4. Tucker, P.K. RM. Adkins, and J.S. Rest. 2003. Differential rates of evolution for the ZFY-related zinc finger genes, Zfy, Zfx and Zfa in the mouse genus *Mus*. *Molecular Biology and Evolution* 20: 999-1005.
3. Dimmic, M, J.S. Rest, D. Mindell and R. Goldstein. 2002. rtREV: an amino acid substitution matrix for inference of retrovirus and reverse transcriptase phylogeny. *Journal of Molecular Evolution* 55: 65-73.
2. Meshnick S.R., P.A. Hossler, K.S. Enger, P. Kazanjian, J.S. Rest, D. Mindell, B. Li, C.H. Lee, L.F. Nimri, J.L. Carter, C.B. Beard, L. Huang. 2001. Distribution of DHPS mutations among ITS subtypes of *P. carinii f. sp. hominis*. *Journal of Eukaryotic Microbiology* Suppl: 126S-128S.

1. Liu, Y., Y Shen, J.S. Rest, P. Raymond, and D. Zack. 2001. Isolation and characterization of a zebrafish homologue of the cone rod homeobox gene. *Investigative Ophthalmology and Visual Science* 42: 481-487.

Preprints

Gil-Gomez, Alejandro, and Joshua S. Rest. 2023. "Wiring between close nodes in biological networks evolves more quickly than between distant nodes." *bioRxiv*. https://doi.org/10.1101/2023.05.23.541989.

Figueiredo, J., J.S. Rest, S. Adamo, R. Grella, J. Dilger. Nicotine stimulates peristalsis in *N. vectensis*: from behavior to nicotinic receptor genes, 16 February 2021 (Version 1) available at Research Square [https://doi.org/10.21203/rs.3.rs-195699/v1]

Book Chapters, Reviews, and Contributions

Liberles, D.A., M.M. Meyer, J.S. Rest, A.I. Teufel. 2021 Zuckerkandl Prize. *Journal of Molecular Evolution* 90 (1).

Rest, J.S. 2010. "The expansion of molecular data in evolutionary biology." Pp. 663-666 in Bell, M.A., W.F. Eanes, D.J. Futuyma, and J.S. Levinton (eds.), *Evolution After Darwin: the First 150 Years*. Sinauer Associates, Sunderland.

Rest, J.S. 2008. "Virology: Principles and Applications. By John Carter and Venetia Saunders." *The Quarterly Review of Biology* 83(2): 218-219.

Mindell, D.P., J.S. Rest, and L.P. Villarreal. 2004. "Viruses and the tree of life." Pp. 107-118 in Cracraft, J. and M.J. Donoghue (eds.), *Assembling the Tree of Life*. Oxford University Press, New York.

Grants

Gordon and Betty Moore Foundation. Award 12188 (Collier, PI; Rest, Co-Investigator; Subgrant via J. Archibald at Dalhousie University). "Symbiosis methods development: Symbiosis and gene transfer in the lab." $278,439. 2023-2026.

SBU School of Atmospheric and Marine Sciences, Seed Grant (internal; Collier, PI; Rest, Co-Investigator). "A unique organelle at the interface of the carbon cycle and marine food webs." $29,478. 2021-2022.

Gordon and Betty Moore Foundation. Award 4982.01 (Collier, PI; Rest, Co-Investigator). "New Genetic Tools for Marine Protists." $335,343. 2019-2021.

Gordon and Betty Moore Foundation. Award 4982 (Collier, PI; Rest, Co-Investigator). "Screening marine microeukaryotes for their amenability for genetic tool development." $324,383. 2015-2019.

NIH/NIGMS R01 Award 1R01GM108904-01A1. (Rest, Principal Investigator) $938,125. "Fitness and modularity of stochastic variation in protein expression levels." 2014-2019

Professional Service

2022- Associate Editor, *Frontiers in Molecular BioSciences, Molecular Evolution Section.*
2018- Associate Editor, *Journal of Molecular Evolution*
2016- Book Review Consultant, *Quarterly Review of Biology*
2003- External Reviewer: *Science, Genome Research, Molecular Biology and Evolution, BMC Genomics, PLOS One, Genomics, Gene, Journal of Molecular Evolution, Cladistics.*

Teaching Awards

Godfrey Excellence in Teaching Award (2021)

Teaching – Undergraduate

- Bioinformatics and Computational Biology. Developed Lecture and Lab. Annually 2009 – present.
- Evolution; co-taught with Wiens (2009,2011); Futuyma (2013,2015); Hollister (2017, 2018, 2019); Vitek (2020); Beaupre (2021,2022)
- First year seminar: The riskiness and awesomeness of sequencing your own personal genome (2022)

Teaching – Graduate Lectures and Seminars

- Graduate Discussion Seminars: Origin of Species (2022); Phylogenomics (2017); Next-Generation Sequencing in Ecology & Evolution (2013); Evolution of Biological Networks (2008)
- Bioinformatics seminars in Graduate Molecular Genetics. Annually 2009 – present.
- Phylogenetics seminars in Principles of Evolution. Annually 2014 – present.

Postdoctoral Advisees

2019-2021 Anbarasu Karthikaichamy (co-advised with Jackie Collier)
2020-2021 Mariana Rius (co-advised with Jackie Collier)

Doctoral and Master's Advisees

2021-2022 David Carlson. "How does the repeated evolution of functional asexuality impact patterns of deleterious variation in *Oenothera*?" (Doctoral)
2020-2021 Michael Horowitz (Master's; Chemistry; co-advised with J. Collier)
2018- Alejandro Gil Gomez. "Evolution of antibiotics and their targets: phylogenetics, rates, interactions, and natural history." (Doctoral)
2018-2021 Mariana Rius. "Evolutionary origins, regulation, and function of carotenoid biosynthesis in the marine heterotrophic eukaryote, *Aurantiochytrium limacinum*." (Doctoral; co-advised with J. Collier)
2016-2022 Keffy Kehrli. Using computational techniques to analyze the tempo and mode of gene expression evolution. (Graduate Program in Genetics)
2008-2015 Christopher Morales. "Gene regulation and interaction in the *Saccharomyces cerevisiae* genome." (Doctoral; Graduate Program in Genetics; Turner Fellow)
2008-2015 Dana Opulente. "Network evolution: Network topologies of carbon assimilation in generalists and specialists." (Doctoral)
2012-2014 Niamh O'Hara. "Genetics and evolution of plant response to pathogens in a changing environment." (Doctoral; co-advised with S. Franks)

2009-2014 Aman Gill. "The impact of host range evolution on population dynamics in the aphid *Uroleucon ambrosiae*." (Doctoral, co-advised with D. Futuyma)

2009-2014 John Waldron. "Evolution of gene expression: Characterizing recent divergence and phenotypic integration at two fundamental levels on the road from genotype to phenotype." (Master's)

2011-2013 Julius Fisher. "Detecting the evolution of control coefficients of metabolic enzymes in the sphingolipid biosynthesis pathway." (Master's)

Dissertation Committees (not including advisees; E&E program unless indicated)

30. Helen Ridout, Interdepartmental Doctoral Program in Anthropological Sciences (2023-)
29. Carlos Morantes Ariza (2023-)
28. Alexander Kwakye (Genetics; 2023-)
27. Lingjie Liu (Genetics; 2022-)
26. Paul Donat (2022-)
24. Alexis Brown (2022-)
23. William Thomas (2022-)
25. Nicolette Sipperly (2021-)
22. Eram Kabir (Bioengineering M.S.) "Tuberculosis: Mce3R Binding Site Analysis." (2021-2022)
21. Maxwell Shapiro, Applied Mathematics and Statistics. "A Computational Approach to Viral Co-evolution with Host DNA Deaminases." (2021)
20. Laraib Malik, Computer Science. "Algorithms for improving quantification accuracy in reference based and de novo transcriptomics." (2020)
19. Oleksandra Romanyshyn, Biomedical Engineering. "Multiscale synthetic control of multicellularity and drug resistance in yeast." (2019-2022)
18. Alyssa Liguori, "Population dynamics in the rocky intertidal zone: Acclimation and adaptation to extreme abiotic conditions in the copepod *Tigriopus californicus*." (2019-2020).
17. Avi Srivastava, Computer Science. "Efficient quantification of bulk and droplet-based single-cell RNA-sequencing data." (2019)
16. Tianyu Li, "Evolvability of sexual dimorphism in life history traits of *D. melanogaster*." (2017-)
15. Laurel Yohe, "Vomeronasal evolution in bats." (2016-2017)
14. Frank Celeste, Graduate Program in Genetics. "The Emergence of Drug Tolerance in Cancer Cell Populations" (2016-2020)
13. Jeewoen Shin, Applied Mathematics and Statistics. "Evolution of complexity in gene regulatory networks during host-parasite coevolution." (2016)
12. Fangfei Li, Applied Mathematics and Statistics. "Evolutionary dynamics of two-step beneficial mutations via a double-barcoding system." (2016-2020)
11. Jason O'Rawe, Graduate Program in Genetics. "Whole genome sequencing of a three generation pedigree." (2015-2016)
10. Evgeny Brud. "The population genetics of female meiotic drive." (2014-2018)
9. Meng Lin, Graduate Program in Genetics. "Genetic architecture of height and skin pigmentation in southern African populations." (2014-2017)
8. Ying Cai, Graduate Program in Molecular and Cellular Biology. "Effects of the yeast RNA-binding protein Whi3 on the CLN3 mRNA and other targets." (2013)

7. Jennifer Rollins. “The genetics of growth in threespine stickleback.” (2013-2017)
6. Yifeng Xu, Graduate Program in Molecular and Cellular Biology. “Transcriptional regulation of IME1 and middle meiotic genes during meiosis in *Saccharomyces cerevisiae*.” (2013-2016)
5. Spencer Koury. “Genetic variation and adaptive evolution in membrane physiology.” (2012-2017)
4. Omar Warsi. “Studying evolutionary adaptations along the different axis of an organism’s niche and measuring correlated responses along other axes.” (2011-2014)
3. Loretta Au, Department of Applied Math and Statistics. “Sequence space exploration: Understanding protein interaction specificity through computational and theoretical methods.” (2010-2014)
2. Joseph Lachance, Graduate Program in Genetics. “Life after beanbag genetics: Theoretical and empirical studies on epistasis and penetrance.” (2010)
1. Nicole Lashbrook. “Phylogenomic analysis of sex-dependent gene expression to assess alternative models of evolution in relation to sex.” (2008-2011)

Undergraduate/ Postbaccalaureate Research Advisees (year started)

2022 Pasquale Matera, Natalie Sokolow
2021 Simon Yatskar
2020 Whitney Wong, Priya Aggarwal, Injun Choi
2019 Xegfred Lou Quidet, Bingyuan Zhu, Michael Horowitz, Jordan Chee, Zain Ahmed
2018 Alan Na, Gene Yang, Jennifer Yuen, Gil Pagaspas, Sharon Li
2017 Scott Lavington, Gene Yang, Zhaorong Li, Nina Gu, Eric Jiang, Ariana Ambrosio, Alexander Miles, Brian Yang
2016 Kyle Pacia, Christopher Washer, Sunil Deochand, Tuya Yokoyama, Alejandro Gomez
2015 Robert Pfingsten, Jakub Micko, Yianni Babatsikos
2014 Levi Mangarin, Shin-young Ko, Issac Heon, Faith Conroy, Isaac Rozenberg, Lingling Lou, Chris Esposito, Max Lee
2013 Judy Wong, Kash Bandaralage, Hira Tahir, Alex Gromatsky, Zhifan Yang
2012 Kumar Sugandhakumar, Bart Massi, Clinton Wizelius, Xueying Zhang
2011 Michael Katz, Fiorella Tapia-Ortiz(Bridges to Doctorate Program), Yajie Zhang
2010 Dominic Dabrowski, Jenny Abraham, Raghib Siddiqui
2009 Angela Liu, Ishpreet Chawla, Goeff Bolen, Jason O’Rawe
2008 Linder Oloo, Seungjae Moon

High School Research Advisees

2019-2020 Faye Held, Dylan D’Agate
2018-2019 James Rogers, Alexander Rodriguez (Regeneron Science Talent Search, Top 300)
2015-16 Emily McDermott (2016 Intel Science Talent Search, Semifinalist)
2011-12 Syndi Barish
2009 Demetri Dedousis

Major University Service

2023	Laufer Center Faculty Search Committee
2021-	IMSD Advisory Board
2018	COACHE Working Group on Tenure
2016-2019	Women in GeoSciences, Steering Committee
2014-	Co-advisor, Stony Brook University International Genetically Engineered Machine team
2012	Office of the Vice President for Research Genomics Core Facility Advisory Committee
2011-2014	Co-Coordinator, Evolutionary Functional Genomics Seminar Series
2011-2014	Co-Lead and Search Committee, Genomics Interdisciplinary Faculty Cluster Hire
2010-	Faculty Advisor, Freewheel Collective Student Bicycle Club

Graduate Program Evaluation and Revision

2022-	Led development of Policies and Procedures Manual and Student Handbook
2021-2022	Led revision of Ecology and Evolution Bylaws
2016-2018	Established major changes to existing program (E&E M.A.); via Grad Council, Provost, SUNY, State Ed. Dept.
2013-2014	Genetics Program Curriculum Review Committee
2009	Committee member to establish a new concentration (Applied Evolution) in an existing program (E&E M.A.)

Graduate Program Funding and Outreach

2020-2021	Organizer/Lead, Giving Day drive to benefit E&E Graduate Student Research
2019-2021	Organizer/Lead, E&E Graduate Program Facebook and Twitter feeds
2018,2019	Secured Master's Recruitment Enrichment Funds to advertise M.A. program
2014	Key participant; NSF Research Traineeship (NRT) Proposal. "Big Data, Sparse Data: Integrated analysis of environmental, ecological and genomic data to promote sustainability in a changing world"

Graduate Program Leadership and Administrative Service

2022-	E&E Ph.D. Program Director Graduate Program Assessment Coordinator
2020	E&E Graduate Program Retreat Organizer/Lead
2016-2021	E&E M.A. Graduate Program Director
2011-	M.A. Admissions Committee
'10,'13,'14	PhD Admissions Committee
2011-2014	E&E Graduate Program Executive Committee
2011,2014	Graduate Program Awards Coordinator
2010,2013	E&E Preliminary Exam Committee
2009-2012	Entering Student Advisory Committee (E&E); Head, 2011-2012