Joshua S. Rest
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Curriculum Vitae April 2019

Appointment

Associate Professor (2014-), Department of Ecology and Evolution, Stony Brook University.
Assistant Professor (2008-2014), Department of Ecology and Evolution, Stony Brook University.
Associate Member, Laufer Center for Physical and Quantitative Biology
Director, Ecology and Evolution Master's Degree Program

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: 2682

29. Collier, J.A., J.S. Rest. In press. Swimming, gliding and rolling toward the mainstream: cell biology of marine protists. *Molecular Biology of the Cell.*
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* doi:10.1016/j.chembiol.2018.11.005
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.

Book Chapters

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.

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.

Book Review

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

Grants

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

Gordon and Betty Moore Foundation. (Collier, PI; Rest, Co-Investigator). US$516,073. "Developing molecular genetic tools for Labyrinthulomycetes." 2015-2020

Recent Invited Seminars

10. "Survival and evolution in a changing world: lessons from genomes, transcripts, and proteins." University Libraries Presents: STEM Speakers Series, Stony Brook University. October 5, 2016.
9. "Fitness and modularity of stochastic variation in protein expression levels." Biology Department, Queens College. April 9, 2014.
8. "The role of randomness in regulatory evolution." Department of Natural Sciences, Suffolk County Community College. October 23, 2013.
7. "Roles for bet hedging and stochasticity in regulatory evolution." Department of Biological Sciences, Carnegie Mellon University. October 9, 2013.
6. "Roles for bet hedging and stochasticity in regulatory evolution." Department of Biological Sciences, St. John's University. September 18, 2013.
5. "When does variation matter? Gene expression, environment, and fitness in budding yeast." Department of Biological Sciences, University of South Carolina. October 29, 2012.
4. "Sphingolipid regulation: Hanging off a cliff." Evolutionary Functional Genomics Seminar Series, Cold Spring Harbor Laboratories. October 12, 2010.
3. "A fitness landscape of gene expression." Biology Department, The College of New Jersey, September 23, 2010
2. "Fitness landscapes of gene expression." Department of Biological Sciences, Fordham University, September 22, 2010.

1. "Fitness landscapes of gene expression." BioMaPS Summer School: New Directions in Population Genetics and Evolution. June 16, 2010.

Professional Service

2018- Associate Editor, *Journal of Molecular Evolution*
2017- Associate Editor, *BMC Evolutionary Biology*
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

2017	Seminar: Phylogenomics
2009-	Bioinformatics and Computational Biology (Developed Lecture and Lab)
2009-	Bioinformatics seminars in Graduate Molecular Genetics series
2014-	Phylogenetics seminars in Principles of Evolution
2013	Seminar: Next-Generation Sequencing in Ecology & Evolution
2009-	Evolution (co-taught with J. Wiens in '09/'11; D. Futuyma '13/'15, J. Hollister '17/'18)
2008	Seminar: Evolution of Biological Networks

Doctoral and Master's Advisees

2018- Alejandro Gil Gomez
2017- Roy Nunez
2016- Keffy Kehrli. (Doctoral; 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)
2009-2014 Aman Gill. "The impact of host range evolution on population dynamics in the aphid *Uroleucon ambrosiae*." (Doctoral, co-advised by 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)

18. Mariana Rius. "Evolutionary origins, regulation, and function of carotenoid biosynthesis in the marine heterotrophic eukaryote, *Aurantiochytrium limacinum*." (2018-)
17. Tianyu Li (2017-)
16. David Carlson (2017-)
15. Laurel Yohe, "Vomeronasal evolution in bats." (2016-2017)
14. Frank Celeste, Graduate Program in Genetics. (2016-)
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-)

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)

2019 Xegfred Lou Quidet, Bingyuan Zhu, Michael Horowitz, Jordan Chee
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- Faye Held Dylan D'Agate
2018- James Rogers, Alexander Rodriguez (Regeneron Science Talent Search, Top 300 Scholar)
2015-16 Emily McDermott (2016 Intel Science Talent Search, Semifinalist)
2011-12 Syndi Barish
2009 Demetri Dedousis

Honors

Peter O. Okkelberg Award, Hinsdale Scholarship, Donald W. Tinkle Scholarship, University of Michigan
National Alumni Scholar, Drake University
United States Senate Youth Program and Scholarship

Major University Service

2018-	COACHE Working Group on Tenure
2016-	Women in GeoSciences, Steering Committee
2014-	Co-advisor, Stony Brook University International Genetically Engineered Machine team
2013-2014	Genetics Program Curriculum Review Committee
2012-	Office of the Vice President for Research Genomics Core Facility Advisory Committee
2012-	CoPI, NIH P50 Grant: "A physical and evolutionary approach to systems biology"
2011-	Co-Coordinator, Evolutionary Functional Genomics Seminar Series
2011-2014	Co-Lead and Search Committee, Genomics Interdisciplinary Faculty Cluster Hire (6 positions)
2010-	Faculty Advisor, Freewheel Collective Graduate Student Bicycle Club