**Michael James Landis**
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landislab.org
*Last updated: Feb 17, 2023*

**Education**

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| 2015 | Ph.D. Integrative Biology<br>*Designated Emphasis in Computational & Genomic Biology*<br>University of California, Berkeley, CA |
| 2005 | B.S. Computer Science<br>California State University, Long Beach, CA |

**Employment**

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| 2019— | Assistant Professor<br>Department of Biology<br>Washington University, St. Louis, MO |

**Research experience**

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| 2016—2019 | Postdoctoral fellow, Yale University, New Haven, CT |
| 2016 | Postdoctoral researcher, Iowa State University, Ames, IA |
| 2010—2015 | Graduate researcher, University of California, Berkeley, CA |
| 2009—2010 | Bioinformatician, Children's Hospital of Oakland, Oakland, CA |

**Research Interests**

I research relationships between evolutionary processes and patterns through a combination of biological, computational, and statistical approaches. My current interests include statistical phylogenetics, historical biogeography, the evolution of ecological interactions, phenotypic evolution, pathogen host-switching, stochastic processes, model design, Bayesian inference, and deep learning. My work typically involves the design of probabilistic models and inference methods to test evolutionary hypotheses in biological and simulated datasets.

**Fellowships & Awards**

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| 2019 | Yale Donnelley Postdoctoral Environmental Fellowship (resumed) |
| 2017—2018 | NSF Postdoctoral Research Fellowship |
| 2016 | Yale Donnelley Postdoctoral Environmental Fellowship |
| 2016 | Ernst Mayr Award (Society of Systematic Biologists) |
| 2015 | UC Berkeley Integrative Biology Summer Research Award |
| 2012, 2015 | UC Berkeley Computational Biology Travel Award |
| 2013 | National Evolutionary Synthesis Center Graduate Student Fellowship |
| 2012 | Google Summer of Code Student Fellowship |

**External grants**

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| 2021—2024 | NSF-DEB 2040347: "Modeling the Origin and Evolution of Hawaiian Plants"<br>Awarded $1.12M to PIs Landis (Lead), Zapata, Wagner, Rønsted |

**Internal grants**

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| 2022 | WUSTL ITF: "The Human-Wildlife Interface: Disease Dynamics and Pandemic Prevention"<br>Awarded $116k to PIs Milich (co-Lead), Landis (co-Lead), Wang |

**Manuscripts – Under Review** ‡: group postdoc co-author

2023
1. **‡A Thompson**, B Liebeskind, EJ Scully EJ, **Landis MJ**. 2023. Deep learning approaches to viral phylogeography are fast and as robust as likelihood methods to model misspecification. bioRxiv 2023.02.08.527714.
2. Quintero IM, **Landis MJ**, Jetz W, Mórlòn H. 2023. The build-up of the present-day tropical diversity of tetrapods. bioRxiv 2022.12.05.519156.

**Manuscripts – Accepted** ‡: group postdoc co-author

2023
1. Kawahara AY, Storer C, Carvalho APS, Plotkin DM, Condamine F, **‡Braga MP**, ..., **Landis MJ**, ..., Lohman DJ. Evolution and diversification dynamics of butterflies. Accepted. Nature Ecology & Evolution.

**Manuscripts – Published** ‡: group postdoc co-author; *: shared first author; §: shared corresp. author

2023
1. Nielsen SV, Vaughn A, Leppälä, **Landis MJ,** Mailund T, Nielsen R. 2023. Bayesian inference of admixture graphs on Native American and Arctic populations. PLoS Genetics 19:e1010410.

2022
2. Dismukes W, **‡Braga MP**, Hembry DH, Heath TA, **Landis MJ**. Cophylogenetic methods to untangle the evolutionary history of ecological interactions. Annual Reviews of Ecology, Evolution, and Systematics. 53:275–298.
3. Donoghue MJ, Eaton DAR, Maya-Lastra CA, **Landis MJ**, Sweeney PJ, Olson, ME, Cacho NI, Moeglin MK, Gardner JR, Heaphy NM, Castorena M, Segovia Rivas A, Clement WL, Edwards EJ. 2022. Replication radiation of a plant clade along a cloud forest archipelago. Nature Ecology and Evolution. doi:10.1038/s41559-022-01823-x.
4. Barido-Sottani J, Justison JA, Borges R, Brown JM, Dismukes W, do Rosario Petrucci B, Fabreti Guimarães L, Höhna S, **Landis MJ**, Lewis PO, May MR, Mendes FK, Pett W, Redelings BD, Tribble CM, Wright AM, Zenil-Ferguson R, Heath TA. 2022. Lessons learned from organizing and teaching virtual phylogenetics workshops. Bulletin of the Society of Systematic Biologists doi:10.18061/bssb.v1i2.
5. Wendt EW, Malabarba LR, **‡Braga MP**, Boeger WA, **Landis MJ**, Carvalho TP. Phylogeny, species delimitation, and ecological and morphological diversity of Characithecium (Monogenoidea: Dactylogyridae). 2022. Parasitology 149: 700–716.
6. **Landis MJ**, Quintero I, Muñoz MM, Zapata F, Donoghue MJ. Phylogenetic inference of where species spread or split across barriers. 2022. Proceedings of the National Academy of Sciences 119: e2116948119.
7. Tribble CM, Freyman WA, Lim JY, **Landis MJ**, Barido-Sottani J, Kopperud BT, Höhna S, May MR. 2022. RevGadgets: an R Package for visualizing Bayesian phylogenetic analyses from RevBayes. Methods in Ecology and Evolution 13: 314–323.

2021
8. Höhna S, **Landis MJ**, and Huelsenbeck JP. 2021. Parallel power posterior analyses for fast computation of Bayes factors in phylogenetics. PeerJ: 9:e12438.
9. **‡Braga MP**, Janz N, Nylin S, Ronquist F, and **Landis MJ**. 2021. Phylogenetic reconstruction of ancestral ecological networks through time for pierid butterflies and their host plants. Ecology Letters 24: 2134-–2145.
10. **Landis MJ**, Edwards EJ, and Donoghue MJ. 2021. Modeling phylogenetic biome shifts on a planet with a past. Systematic Biology. 70: 86–107.
11. **Landis MJ**, Eaton DAR, Clement WL, Park B, Spriggs EL, Sweeney PW, Edwards EJ, and Donoghue MJ. 2021. Joint phylogenetic estimation of geographic movements and biome shifts during the global diversification of Viburnum. Systematic Biology. 70: 67–85.

2020
12. **‡Braga MP**, **Landis MJ**, Nylin S, Janz N, and Ronquist F. 2020. Bayesian inference of ancestral host-parasite interactions under a phylogenetic model of host repertoire evolution. Systematic Biology 69: 1149—1162.
*Awarded Best Paper in Systematic Biology in 2020.*

13. Field DJ, Berv JS, Hsiang AY, Lanfear J, **Landis MJ**, Dornberg A. 2020. Timing the extant avian radiation: The rise of modern birds, and the importance of modeling molecular rate variation. Bulletin of the American Museum of Natural History 440: 159–181.
14. Kim AS, Zimmerman O, Nelson CA, Basore K, Zhang R, Desai C, Bullock C, Durnell L, Deem SL, Oppenheimer J, Shapiro B, Wang T, Coyne CB, Handley SA, **§Landis MJ**, §Fremont DH, and §Diamond MS. 2020. A sequence insertion in the Mxra8 receptor of Bovinae family members confers resistance to alphavirus infection. Cell Host & Microbe 27: 428-440.
15. Quintero I and **Landis MJ**. 2020. Interdependent phenotypic and biogeographic evolution driven by biotic interactions. Systematic Biology 69: 739–755.

2018
16. **Landis MJ**, Freyman WA, and Baldwin BG. 2018. Retracing the Hawaiian silversword radiation despite phylogenetic, biogeographic, and paleogeographic uncertainty. Evolution 72: 2343–2359.
17. Park B, Sinnott-Armstrong M, Schlutius C, Zuluaga, J-CP, Spriggs EL, Simpson RG, **Landis MJ**, Sweeney PW, Eaton DAR, and Donoghue MJ. 2018. Sterile marginal flowers increase visitation and fruit set in the hobblebush (Viburnum lantanoides, Adoxaceae) at multiple spatial scales. Ann. Bot. 123: 381-390.

2017
18. **Landis MJ** and Schraiber JG. 2017. Pulsed evolution shaped modern vertebrate body sizes. Proceedings of the National Academy of Sciences 114: 13224–13229.
19. Höhna S, **Landis MJ**, Heath TA. 2017. Phylogenetic inference using RevBayes. Current Protocols in Bioinformatics 57:6.16.1–6.16.34.
20. **Landis, MJ**. Biogeographic dating of speciation times using paleogeographically informed processes. 2017. Systematic Biology 66:128–144.

2016
21. Höhna S, **Landis MJ**, Heath TA, Boussau B, Lartillot N, Moore BR, Huelsenbeck JP, and Ronquist F. 2016. RevBayes: Bayesian phylogenetic inference using graphical models and an interactive model-specification language. Systematic Biology 65:726-736.

2015
22. Schraiber JG and **Landis MJ**. 2015. Sensitivity of quantitative traits to mutational effects and number of loci. Theoretical Population Biology 102:85–93.

2014
23. Höhna S, Heath TA, Boussau B, **Landis MJ**, Ronquist F, and Huelsenbeck JP. 2014. Probabilistic graphical model representation in phylogenetics. Systematic Biology 63:753–771.
24. **Landis MJ** and Bedford T. 2014. Phylowood: interactive web-based animations of biogeographic and phylogeographic histories. Bioinformatics 30:123–124.

2013
25. **Landis MJ**, Matzke NJ, Moore BR, and Huelsenbeck JP. Bayesian analysis of biogeography when the number of areas is large. 2013. Systematic Biology 62:789–804.
26. ***Landis MJ**, *Schraiber JG, and Liang M. 2013. Phylogenetic analysis using Lévy processes: finding jumps in the evolution of continuous traits. Systematic Biology 62:193–204.

**Book Chapters – Published**

2020
1. Landis MJ. Biogeographic dating of phylogenetic divergence times using priors and processes. 2020. In Ho SYW (ed.), The Molecular Evolutionary Clock: Theory and Practice. Springer.

**Research Software**

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| RevBayes, phylogenetic inference using graphical models | revbayes.github.io |
| BayArea, Bayesian biogeographic inference for many areas | github.com/mlandis/bayarea |
| pulsR, simulate and fit macroevolutionary trait models | github.com/Schraiber/pulsR |
| creepy-jerk, Bayesian inference of evolutionary jumps in traits | github.com/mlandis/creepy-jerk |
| Phylowood, interactive biogeographic animations | mlandis.github.io/phylowood |
| qtc, trait evolution under the coalescent | github.com/Schraiber/quant_trait_coalescent |

**Presentations – Invited** *: graduate student invited

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| 2023 | Standalone Meeting for the Society of Systematic Biologists, Mexico City |
| 2022 | Meeting of Systematics, Biogeography, and Evolution (virtual) |
| | *Melinda Denton Endowed Seminar on Plant Systematics, University of Washington |
| | *Ecology and Evolution Seminar, University of Minnesota, Minneapolis (virtual) |
| | Biodiversity Research Center Seminar, University of British Columbia, Vancouver (virtual) |
| 2021 | European Society of Evoutionary Biologists, Satellite Meeting (virtual) |
| | Biology Seminar, University of Nebraska, Lincoln (virtual) |
| | Statistics Seminar, Washington University in St. Louis (virtual) |
| 2020 | Biology Seminar, University of Missouri, St. Louis (virtual) |
| | Living Earth Collaborative Seminar, Washington University in St. Louis (virtual) |
| 2019 | St. Louis Ecology, Evolution & Conservation Seminar, Lewis & Clark Community College |
| | Biological Sciences Seminar, Auburn University |
| 2018 | Plant Biology Seminar, University of Georgia |
| | Evolution & Systematics Seminar, University of Connecticut |
| | Phyloseminar, an online society-sponsored seminar (http://phyloseminar.org/) |
| | Department of Biology Seminar, University of Oregon |
| | Department of Biology Seminar, Washington University in St. Louis |
| 2017 | Symposium on Computational Paleobiology, Geological Society of America, Seattle |
| | Systematics Seminar, Swedish Museum of Natural History |
| 2016 | Computational Genomics Seminar, Temple University |
| 2015 | Symposium on Parametric Biogeography, Evolution Conference in Guaruja, Brazil |
| 2013 | Phylogenetics & Evolutionary Biology Seminar, North Carolina State University |
| | Workshop on Mathematics for an Evolving Biodiversity, University of Montréal |
| | Center for Population Genomics Seminar, UC Davis |

**Presentations – Contributed**

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| 2022 | International Biogeography Society Conference (virtual) |
| 2022 | Evolution Conference (virtual) |
| 2021 | Evolution Conference (virtual) |
| 2020 | Midcontinent Paleobotanical Colloquium (virtual) |
| 2019 | Evolution Conference in Providence |
| | Yale Institute for Biospheric Studies Seminar |
| 2017 | External Advisory Board Meeting, Yale Institute for Biospheric Studies |
| | Evolution Conference in Portland |
| 2016 | Ernst Mayr Symposium, Evolution Conference, Austin |
| 2013 | Evolution Conference in Snowbird |
| | Center for Theoretical Evolutionary Genomics, UC Berkeley |
| 2012 | Center for Theoretical Evolutionary Genomics, UC Berkeley |
| | Evolution Conference in Ottawa |

**Professional Reviews**

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| Journals | American Journal of Botany, Annals of Botany, Bioinformatics, BMC Evolutionary Biology, Evolution, Genome Biology & Evolution, Journal of Biogeography, Methods in Evolution & Ecology, Methods in Ecology & Evolution, Molecular Biology & Evolution, Molecular Phylogenetics & Evolution, Nature Communications, New Phytologist, Paleobiology, Proceedings of the Royal Society B, Proceedings of the National Academy of Sciences USA, Systematic Biology, Trends in Ecology & Evolution, Zoological Journal of the Linnean Society |

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| Grants | NSF reviewer, SSB Ernst Mayr applications, SSB graduate award grants |

**University Service**

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| 2022 | Hiring Committee for Genetics & Genomics Faculty |
| 2022 | Hiring Committee for Urban Biology & Environmental Justice Faculty |
| 2021— | Faculty mentor for WUSTL Chapter within the Society for Advancement of Chicanos/Hispanics and Native Americans in Science |
| 2019— | WUSTL Biology Curriculum Committee |
| 2019— | EEPB Steering Committee |
| 2019— | EEPB Admissions Committee |
| 2012—2013 | Co-chair, Integrative Biology Graduate Student Assembly, UC Berkeley |

**Society Service**

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| 2022— | Associate Editor for Systematic Biology |
| 2021— | Legacy Committee member for Society for Systematic Biologists |
| 2021,2022 | One-off ERC mentor for Evolution meeting |
| 2019—2022 | Council member for Society for Systematic Biologists |
| 2018—2022 | Editorial board member for Systematic Biology |
| 2019 | Symposium organizer for Society of Systematic Biologists on The Bright Side of Phylogenetics |

**Teaching & Courses**

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| 2020—2022 | Instructor, BIOL4220, Practical Bioinformatics, WUSTL |
| 2022 | Invited Lecturer, EEB103, Statistical Phylogenetics & Speciation, UC Davis |
| 2021 | Instructor, BIOL580, EEPB Graduate Seminar, WUSTL |
| 2016 | Invited Lecturer, BIOL1425, Phylogenetic Biology, Brown University |
| 2014 | Invited Lecturer, IB87, Bioinformatics, UC Berkeley |
| 2013 | Invited Lecturer, EEB101, Macroevolution, UC Davis |

**Teaching Assistance**

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| 2012 | Teaching Assistant, IB200A, Principles of Phylogenetics, UC Berkeley |
| 2011 | Teaching Assistant, IB164, Human Genetics and Genomics, UC Berkeley |

**Research Lab Mentoring & Advising**

*WUSTL Postdoctoral Scholar*

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| 2021— | Fábio Mendes, Statistical Phylogenetics |
| 2019—2021 | Mariana Braga, Evolution & Ecology |

*ORISE Postdoctoral Scholar*

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| 2021— | Ammon Thompson, Statistical Epidemiology |

*WUSTL PhD Student (advised)*

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| 2021— | Sarah Swiston, EEPB |
| 2022— | Sean McHugh, EEPB |

*WUSTL Undergraduate*

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| 2022— | Yu (Sunny) Zichen, Mathematics & Computer Science |
| 2021— | Walker Sexton, Biology |
| 2021—2023 | Mihir Shah, Biomedical Engineering |
| 2021 | Ernie Ramos, Mathematics |

*UC Berkeley Undergraduate*

2013—2015 Bryan Wang, Mathematics
2012—2014 Jaya Narasimhan, Computer Science

**PhD Program Mentoring & Advising**

*WUSTL PhD Student (rotation)*

2022 Preston Pennington, EEPB
2020 Justin Baldwin, EEPB
2020 Aryeh Miller, EEPB

*WUSTL dissertation committee member*

2022— Justin Baldwin, EEPB
2022— Aryeh Miller, EEPB
2022— Changxu Fan, Immunology
2022— Jenna Lin, BBSB
2021— Brock Mashburn, EEPB
2021— Jhan Salazar, EEPB
2020— Wen-His Kuo, EEPB
2020—2022 Erika Schumacher, EEPB
2020 Qi Wang, Statistics

**Outreach**

2021 Instructor, Stay-at-Home RevBayes Workshop (virtual)
2020 Instructor, Stay-at-Home RevBayes Workshop (virtual)
2018—2019 Instructor, Molecular Evolution Workshop, Woods Hole
2019 Instructor, Bodega Phylogenetics Workshop, UC Davis
2019 Instructor, RevBayes Workshop, Yale University, New Haven
2017 Instructor, Fossil tip-dating with RevBayes, GSA Meeting, Seattle
2017 Instructor, Biogeography with RevBayes, SSB Meeting, Baton Rouge
2017 Instructor, Introduction to RevBayes, Yale, New Haven
2014—2016 Teaching Assistant, Molecular Evolution Workshop, Woods Hole
2015 Instructor, RevBayes Workshop, UC Berkeley
2014, 2015 Instructor, Bodega Phylogenetics Workshop, UC Davis
2014 Instructor, Applied Phylogenetics Workshop, NESCent
2014, 2015 Guest Lecturer, Berkeley High School Science Outreach
2014 Guest Lecturer, Bay Area Scientists in Schools
2009—2010 Tutor, 826 Valencia volunteer for English Language Learners

**Professional Societies**

2009— Society of Systematic Biologists
2012— Society for the Study of Evolution
2018— International Biogeography Society
2021— Society for Advancement of Chicanos/Hispanics and Native Americans in Science
2017—2020 Geological Society of America

**Professional Experience**

2005—2008 IT Consultant, Varsity Technologies, San Francisco, CA

**Advisors**

PhD John P. Huelsenbeck

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| | Department of Integrative Biology<br>UC Berkeley |
| Postdoctoral | Tracy A. Heath<br>Department of Ecology, Evolution, and Organismal Biology<br>Iowa State University |
| Postdoctoral | Michael J. Donoghue<br>Department of Ecology and Evolutionary Biology<br>Yale University |