

## MARIA E. ORIVE

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### CURRENT POSITION

Associate Dean, College of Liberal Arts & Sciences, and Professor, Department of Ecology & Evolutionary Biology, University of Kansas

### RESEARCH INTERESTS

- Evolutionary theory and population genetics of organisms with complex life histories, including clonal reproduction.
- Life history evolution and the evolution of senescence.
- Effects of population structure and life-history attributes on gene flow and genetic diversity.
- Use of multilocus genotypic data in analyzing gene flow and hybrid zones.
- Within- and between-host pathogen and symbiont population dynamics.

### EDUCATION

- 1988-1994 **PhD in Zoology**, University of California, Berkeley, CA  
Advisor: Montgomery Slatkin
- 1989 **Tropical Biology #89-3**, Organization for Tropical Studies  
Universidad de Costa Rica, Costa Rica
- 1984-1988 **BS in Biological Sciences, with Honors**, Stanford University, Stanford, CA  
Advisors: Marc Feldman, Paul Ehrlich

### ACADEMIC APPOINTMENTS

- 2021-present **Associate Dean**, Natural Sciences & Mathematics, College of Liberal Arts and Sciences, University of Kansas, Lawrence, KS
- 2019-present **Professor**, Department of Ecology and Evolutionary Biology  
University of Kansas, Lawrence, KS
- 2019-2021 **Chair**, Department of Ecology and Evolutionary Biology  
University of Kansas, Lawrence, KS
- 2012-2019 **Associate Chair for Faculty**, Department of Ecology and Evolutionary Biology, University of Kansas, Lawrence, KS
- 2007-2019 **Faculty Ombudsman**, University Ombuds Office, University of Kansas, Lawrence, KS
- 2007-2008 **The Carl and Lily Pforzheimer Foundation Fellow**, Radcliffe Institute for Advanced Study, Harvard University, Cambridge, MA
- 2004-2019 **Associate Professor**, Department of Ecology and Evolutionary Biology  
University of Kansas, Lawrence, KS
- 1997-2004 **Assistant Professor**, Department of Ecology and Evolutionary Biology  
University of Kansas, Lawrence, KS
- 1996-1997 **Postdoctoral Fellow**, Institute of Cell, Animal, and Population Biology  
University of Edinburgh, Edinburgh, UK, Advisor: Nicholas Barton
- 1994-1996 **Postdoctoral Associate**, Department of Genetics  
University of Georgia, Athens, GA, Advisor: Marjorie Asmussen

## HONORS AND AWARDS

- 2022 **American Association for the Advancement of Science (AAAS) Fellow**  
2007-08 **Radcliffe Institute Fellowship**, Radcliffe Institute for Advanced Study,  
Harvard University  
2005-06 **Senior Administrative Fellow**, University of Kansas  
1996-97 **NSF-NATO Postdoctoral Fellowship**, University of Edinburgh  
1993-94 **Dissertation-Year Fellowship**, University of California, Berkeley  
1989 **Smithsonian Tropical Research Institute (STRI) Fellowship**, Panama  
1988-92 **NSF Minority Graduate Fellowship**, University of California, Berkeley

## FUNDING AND GRANTS

- 2023-27 **NIFA-NSF-NIH Ecology and Evolution of Infectious Diseases (EEID) Research Grant**, 2023-67015-40544, “Invasive species as conduits for pathogen spillover between natural and agricultural systems”, \$456,839, **Subaward PI** (pass-through entity University of Florida; total grant \$2,994,963, PI Erica Goss).  
2019-24 **NSF Research Grant**, DEB-1923495, “Collaborative Research: SG: Clonality and the scope for adaptation in heterogeneous environments,” \$162,324, **PI** (collaborative grant with University of Florida; total grant \$200,000).  
2019-23 **Agence Nationale de la Recherche (ANR, France)**, “Clonix2D: The genetic consequences of partial clonality in populations colonizing new areas”, €437,707, **Co-PI** (PI, Solenn Stoeckel, INRA Rennes).  
2018-20 **Institut National de la Recherche Agronomique (INRA, France)**, INVAMAT (INRA-SPE), “Evolvability of invasive species: Modeling the demogenetics of invasive populations in spatially-explicit contexts”, €15,000, **Co-PI** (PI, Solenn Stoeckel, INRA Rennes).  
2014-19 **NSF Research Grant**, DEB-1354754, “SG: Evolutionary lag and the effects of clonal structure”, \$149,022, **PI**.  
2010-12 **General Research Fund Award**, University of Kansas, “Patterns of host-endosymbiont association: linking theory and data”, \$4,620, **PI**.  
2001-06 **NSF Research Grant**, DEB-0108242, “Mutation and levels of selection in clonal organisms”, \$151,995, **PI**.  
2001-06 **NIH Research Grant**, 1 R01 GM60792-01A1, “Within-host population dynamics of retrovirus vaccine”, \$254,660 (subcontract; total grant \$1,285,817 with University of Kansas Medical Center), **Co-PI**.  
1998-01 **NSF Minority Research Planning Grant**, DEB-9813335, “Mutation and selection in clonal organisms”, \$18,000, **PI**.  
1998-99 **New Faculty General Research Fund**, University of Kansas, “Theoretical models of mutation and selection with clonal reproduction”, \$5,000, **PI**.  
1992-93 **NIH Research Supplement for Underrepresented Minorities in the Biomedical Sciences**, University of California, Berkeley

## PUBLICATIONS

- Orive, M.E.**, M. Barfield, and R.D. Holt. (2023) Partial clonality expands the opportunity for spatial adaptation. *American Naturalist* 202(5):681-698, <https://doi.org/10.1086/726335>
- Peniston, J.H., M. Barfield, R.D. Holt, and **M.E. Orive**. (2021) Environmental fluctuations dampen the effects of clonal reproduction on evolutionary rescue. *Journal of Evolutionary Biology* 34:710-722, <https://doi.org/10.1111/jeb.13778>
- Orive, M.E.** and S. Krueger-Hadfield. (2021) Sex and Asex: a clonal lexicon. *Journal of Heredity* 112:1-8, <https://doi.org/10.1093/jhered/esaa058>
- Rushworth, C.A., R.S. Baucom, B.K. Blackman, M. Neiman, **M.E. Orive**, A. Sethuraman, J. Ware, and D.R. Matute. (2021) Who are we now? A demographic assessment of three evolution societies. *Evolution* 75(22): 208-218, <https://doi.org/10.1111/evo.14168>
- Orive, M.E.** (2020) The evolution of sex, in *The Theory of Evolution* (S.M. Scheiner and D.P. Mindell, eds.), pp. 273-295, University of Chicago Press.
- Agusto, F.B., M.C.A. Leite, and **M.E. Orive**. (2019) The transmission dynamics of a within- and between-hosts malaria model. *Ecological Complexity* 38:31-55, <https://doi.org/10.1016/j.ecocom.2019.02.002>
- Orive, M.E.**, R.D. Holt, and M. Barfield. (2019) Evolutionary rescue in a linearly changing environment: Limits on predictability. *Bulletin of Mathematical Biology* 81:4821-4839, <https://doi.org/10.1007/s11538-018-0504-5>
- Chang, E.S., **M.E. Orive**, and P. Cartwright. (2018) Non-clonal coloniality: Genetically chimeric colonies through fusion of sexually produced polyps in the hydrozoan *Ectopleura larynx*. *Evolution Letters* 2(4):442-455, <https://doi.org/10.1002/evl3.68>
- Orive, M.E.**, M. Barfield, C. Fernandez, and R.D. Holt. (2017) Effects of clonal reproduction on evolutionary lag and evolutionary rescue. *American Naturalist* 190(4):469-490, <https://doi.org/10.1086/693006>
- Carter, J. M., **M.E. Orive**, L.M. Gerhart, J. Stern, R.M. Marchin, J. Nagel, and J.K. Ward. (2017) Warmest extreme year in U.S. history alters thermal requirements for tree phenology. *Oecologia*, 183(4):1197-1210. doi:[10.1007/s00442-017-3838-z](https://doi.org/10.1007/s00442-017-3838-z)
- Barfield, M., **M.E. Orive**, and R.D. Holt. (2015) The role of pathogen shedding in linking within- and between-host pathogen dynamics. *Mathematical Biosciences*, 270:249-262. [doi:10.1016/j.mbs.2015.04.010](https://doi.org/10.1016/j.mbs.2015.04.010)
- Marriage, T. and **M.E. Orive**. (2012) Mutation-selection balance and mixed mating with asexual reproduction. *Journal of Theoretical Biology*, 308:25-35.
- Marriage, T.N., S. Hudman, M.E. Mort, **M.E. Orive**, R.G. Shaw and J.K. Kelly. (2009) Direct estimation of the mutation rate at dinucleotide microsatellite loci in *Arabidopsis thaliana* (Brassicaceae). *Heredity* 103:310-317.
- Orive, M.E.**, M.N. Stearns, J. K. Kelly, M. Barfield, M.S. Smith and R.D. Holt. (2005) Viral infection in internally structured hosts. I. Conditions for persistent infection. *Journal of Theoretical Biology* 232(4):453-466
- Williamson, S., S.M. Perry, C.D. Bustamante, **M.E. Orive**, M.N. Stearns, and J.K. Kelly. (2005). A statistical characterization of consistent patterns of human immunodeficiency virus evolution within infected patients. *Mol. Biol. Evol.* 22:456-468.
- Kelly, J. K., S. Williamson, **M.E. Orive**, M. Smith, and R. D. Holt (2003). Linking dynamical and population genetic models of persistent viral infection. *American Naturalist* 162:14-28.
- Orive, M.E.** and N. H. Barton (2002) Associations between cytoplasmic and nuclear loci in hybridizing populations. *Genetics* 162:1469-1485.
- Williamson, S. and **M.E. Orive** (2002) The genealogy of a sequence subject to purifying selection at multiple sites. *Molecular Biology and Evolution*, 19:1376-1384.

- Orive, M.E.** (2001). Somatic mutations in organisms with complex life histories. *Theoretical Population Biology*, 59:235-249.
- Asmussen, M.A. and **M.E. Orive** (2000) The effects of pollen and seed migration on nuclear-dictyoplasmic systems. I. Nonrandom associations and equilibrium structure with both maternal and paternal cytoplasmic inheritance. *Genetics* 155:813-831.
- Orive, M.E.** and M.A. Asmussen (2000) The effects of pollen and seed migration on nuclear-dictyoplasmic systems. II. A new method for estimating plant gene flow from joint nuclear-cytoplasmic data. *Genetics* 155:833-854.
- Otto, S.P. and **M.E. Orive** (1995) Evolutionary consequences of mutation and selection within an individual. *Genetics* 141:1173 - 1187.
- Orive, M.E.** (1995) Senescence in organisms with clonal reproduction and complex life histories. *American Naturalist* 145:90 - 108.
- Orive, M.E.** (1994) Evolutionary genetic models of organisms with complex life histories. Ph.D. thesis, University of California, Berkeley.
- Orive, M.E.** (1993) Effective population size in organisms with complex life histories. *Theoretical Population Biology* 44:316 - 340.
- Orive, M.E.** and J. F. Baughman (1989) Effects of handling on *Euphydryas editha*. *Journal of the Lepidopterists' Society* 43(3):244 - 247.

#### ARTICLES AND BOOK REVIEWS

- Carlen, E., I. Liao, M. Neiman, **M.E. Orive**, and C. Rushworth (2020) Reflecting on diversity, equity, and inclusion: past and future. SSE Diversity Committee in *SSE Community Blog*, January 16, 2020. <https://ssecommunityblog.org/reflections-on-sse-diversity/>
- Orive, M.E.** (2016) Recombination and selection, in *The Encyclopedia of Evolutionary Biology* (R.M. Kliman, ed.) vol. 3, pp. 417-424, Oxford: Academic Press.
- Orive, M.E.** (2011) Putting the R in evolutionary modeling (book review). *Evolution* 65(3): 912–914

#### OTHER RESEARCH ACTIVITIES

- June 2-4, 2019 **American Genetic Association (AGA) 2019 President's Symposium, Sex and Asex: The genetics of complex life cycles**, Portland, OR. Planned, organized and led symposium as President of AGA.
- Aug. 2018 **2<sup>nd</sup> Joint Congress on Evolutionary Biology/Evolution 2018**, Montpellier, France, Co-organizer of invited symposium: *Evolution on the edge: eco-evolutionary dynamics, range expansion, and local adaptation*.
- Oct. 6-8, 2014 **National Evolutionary Synthesis Center (NESCent) Catalysis Meeting: Evolution and Community Ecology of Host-Associated Microbiota**, Invited participant.

#### INVITED TALKS

- June 8, 2023 **Mathematical Models of Evolutionary Rescue, Max Planck Institute for Evolutionary Biology, Plön, Germany**  
“Effects of partial clonality on evolutionary rescue and the opportunity for spatial adaptation.”
- July 5, 2021 **CLONIX2D Meeting, Rennes, France [hybrid virtual meeting]**  
“Adaptation of partially clonal populations under spatial structure.”

- June 24, 2021 **American Society of Naturalists (ASN) Symposium, *The Theory of Evolution, Evolution 2021* [virtual meeting]**  
 “The evolution of sex: a theory of recombination.”
- Feb. 12-13, 2020 **JF Crow Institute for the Study of Evolution, University of Wisconsin Madison, WI, Darwin Day 2020**  
 “Replicating viruses and adapting clones: Making sense of biology with mathematics,” Wednesday Nite @the Lab, and  
 “Complex life histories: modeling adaptation in time and space,” Evolution Seminar Series.
- Nov. 21-22, 2019 **Department of Biological Sciences, Auburn University, Auburn, AL**  
 “Complex life histories: modeling adaptation in time and space” and  
 “Mathematical models in evolutionary research.”
- Aug. 27, 2019 **BioHasard 2019, *Stochastic Models for Biology*, Rennes, France**  
 “Adaptation to environmental change under partial clonality: the effect of environmental variation.”
- Nov. 10, 2018 **National Association of Biology Teachers (NABT) 2018 Conference, *Scott Williamson Speaker Series*, San Diego, CA**  
 “Mathematical models in evolutionary research.”
- Jul. 9, 2018 **Symposium *Somatic Mutation and the Evolution of Multicellularity*, Annual Meeting of the Society for Molecular Biology and Evolution (SMBE 2018), Yokohama, Japan**  
 “Mutation and selection within an individual.”
- Mar. 5-17, 2018 **3<sup>rd</sup> Bangalore School on Population Genetics and Evolution, International Centre for Theoretical Studies (ICTS), Bangalore, India**  
 “Effects of clonality on evolutionary lag and rescue” + 4 lectures on evolution in age/stage-structured populations and evolution of quantitative traits.
- Mar. 21, 2017 **AMIGO Mini-Conference (Plant and Animal Diseases), INRA Rennes/INRA Nantes, Rennes, France**  
 “Within- and between-host pathogen population dynamics.”
- Mar. 20, 2017 **Institute for Genetics, Environment, and Plant Protection, INRA, Rennes, France**  
 “Mutation and selection within and between clonal organisms.”
- Nov. 30, 2016 **Center for Computational, Evolutionary and Human Genomics, Stanford University**  
 “Mutation and selection within and between clonal organisms.”
- Dec. 11, 2015 ***Montyfest: A Symposium in Honor of Montgomery Slatkin*, University of California, Berkeley**  
 “Evolutionary lag and the effects of clonal reproduction.”
- Nov. 4, 2015 **Department of Ecology and Evolutionary Biology, Yale University**  
 “Mutation and selection within and between clonal organisms.”
- Nov. 6, 2014 **Department of Biology, University of Florida, Gainesville**  
 “Together and apart: a new model of host-endosymbiont population dynamics.”
- Aug. 21, 2014 **National Science Foundation, DEB, Evolutionary Processes Cluster, Washington, DC**  
 “Together and apart: host-endosymbiont population dynamics.”
- Sept. 7, 2011 **Department of Biology, University of North Carolina, Chapel Hill**  
 “Together and apart: modeling host-endosymbiont population dynamics.”

- Jan. 30, 2009 **Department of Biology, Indiana University**  
 “Together and apart: determining patterns of host-endosymbiont association.”
- Oct. 16, 2008 **Department of Ecology, Evolution and Organismal Biology, Iowa State University**  
 “Together and apart: determining patterns of host-endosymbiont association.”
- Apr. 30, 2008 **Radcliffe Institute for Advanced Study, Harvard University**  
 “Together and apart: theoretical models of host-symbiont genome evolution.”
- Jan. 14, 2002 **Institute of Cell, Animal and Population Biology, University of Edinburgh, Scotland, “Levels of selection and mutation in clonal organisms.”**
- Apr. 17, 2001 **Department of Biology, Colorado State University**  
 “Mutation and selection within and between individuals: effects of clonal reproduction and indeterminate growth.”
- Sept. 24, 1999 **Department of Entomology, Kansas State University**  
 “The use of multilocus data for estimating migration rates in hybridizing populations.”
- May 25, 1999 **Institute of Cell, Animal and Population Biology, University of Edinburgh, Scotland**  
 “Mutation and within-individual selection in clonal organisms.”
- Feb. 4, 1999 **Department of Entomology, University of Kansas**  
 “Mutation and selection within individuals: the effects of indeterminate growth and clonal reproduction.”
- June 9, 1996 **Symposium *Frontiers in Molecular Evolution, SBE 1996*, Tucson, AZ**  
 “Evolutionary consequences of somatic mutations: an example from clonal organisms.”
- Oct. 10, 1995 **Institute of Cell, Animal and Population Biology, University of Edinburgh, Scotland, “Life history evolution in clonal organisms.”**
- Dec. 6, 1993 **Laboratoire d'Ecologie, Ecole Normale Supérieure, Paris, France**  
 “Life history evolution in clonal organisms.”
- Nov. 16, 1993 **Institute des Science de l'Evolution, Université de Montpellier, France**  
 “Life history evolution in clonal organisms.”

#### **PAPERS PRESENTED**

- June 25, 2023 **Evolution 2023 – Annual Meeting of the Society for the Study of Evolution (SSE), the American Society of Naturalists (ASN), and the Society of Systematic Biologists (SSB), Albuquerque, NM, “Partial clonality expands the opportunity for spatial adaptation.”**
- June 22, 2019 **Evolution 2019, Providence, RI, “Adaptation of partially clonal populations under spatial structure.”**
- August 8, 2018 **2<sup>nd</sup> Joint Congress for Evolutionary Biology/Evolution 2018, Montpellier, France, “The interaction of spatial structure and clonality on adaptive evolution” in the symposium *Evolution in Metapopulations and Structured Populations: A symposium in honor of Ilkka Hanski, Isabelle Olivieri, and Dave McCauley.***
- June 26, 2017 **Evolution 2017, Portland, OR, “Evolutionary lag and rescue in stage-structured clonal populations.”**
- June 18, 2016 **Evolution 2016, Austin, TX, “Evolutionary lag in populations with both sexual and clonal reproduction.”**
- June 24, 2014 **Evolution 2014, Raleigh, NC, “The effects of clonal reproduction on the rate of evolution.”**

- June 22, 2013 **Evolution 2013, Snowbird, UT**, "The roles of vertical vs. horizontal transmission in host-endosymbiont dynamics."
- June 19, 2011 **Evolution 2011, University of Oklahoma, Norman, OK**, "A new population genetic model of host-endosymbiont dynamics."
- June 28, 2010 **Evolution 2010, Portland State University, Portland, OR**, "Estimating the relative rates of horizontal vs. vertical transmission of coral endosymbionts: a forward model for application to SNP data".
- June 16, 2009 **Evolution 2009, University of Idaho, Moscow, ID**, "Patterns of host-endosymbiont association from measures of identity-by-descent and linkage disequilibrium".
- June 24, 2008 **Evolution 2008, University of Minnesota, Minneapolis, MN**, "Determining patterns of host-endosymbiont association: an identity-by-descent approach".
- June 24, 2006 **Evolution 2006, SUNY Stony Brook, NY**, "Mutation and selection at multiple levels: effects of clonal reproduction and indeterminate growth".
- June 29, 2004 **Evolution 2004, Colorado State University, Ft. Collins, CO**, "Mutations with multilevel fitness effects in organisms with stage-structured life histories".
- June 22, 2003 **Evolution 2003, California State University, Chico, CA**, "Evolutionary genetic models of cnidarians and their algal endosymbionts."
- Jan. 3, 2002 **European Population Genetics Group 35<sup>th</sup> Annual Meeting. University of Leeds, Leeds, UK**, "Mutation and selection in chimeric organisms."
- June 30, 2001 **Evolution 2001, University of Tennessee, Knoxville, TN**, "Dicytoplasmic vs. cytonuclear data: which is better for estimating pollen and seed migration rates?"
- June 25, 2000 **Evolution 2000, Indiana University, Bloomington, IN**, "Somatic mutations with within-individual and individual level fitness effects in modular organisms"
- June 26, 1999 **Evolution 1999, University of Wisconsin, Madison, WI**, "Associations between cytoplasmic and nuclear loci in hybridizing populations"
- June 21, 1998 **Evolution 1998, University of British Columbia, Vancouver, B.C.**, "Somatic mutation in clonal organisms: selection in chimeric individuals"
- June 17, 1997 **Evolution 1997, University of Colorado, Boulder, CO**  
"Multilocus data, migration and hybrid zones."
- June 20, 1996 **Evolution 1996, Washington University, St. Louis, MO**, "Estimating two types of gene flow using joint nuclear-mtDNA-cpDNA data."
- July 12, 1995 **Evolution 1995, McGill University, Montreal, Quebec**, "Estimating pollen and seed migration from joint nuclear-mitochondrial-chloroplast data."
- June 17, 1994 **Evolution 1994, University of Georgia, Athens, GA**, "Somatic mutations in clonal organisms."
- Dec. 18, 1993 **California Population and Evolutionary Genetics Group (CALPEG) Annual Meeting, Stanford University, Palo Alto, CA**, "Somatic mutations in clonal organisms."
- June 22, 1993 **Evolution 1993, Snowbird, UT**, "Senescence in clonal organisms."
- June 18, 1992 **Evolution 1992, University of California, Berkeley, CA**, "A coalescent effective population size for clonal organisms." (Poster)
- Dec. 15, 1991 **CALPEG Annual Meeting, Asilomar, Marin Headlands, CA**, "Effective population size in clonal organisms."

- Aug. 1, 1991 **Evolution 1991, University of Hawaii, Hilo, HI**, "A coalescent approach to effective population size in organisms with complex life-histories."
- Dec. 17, 1990 **CALPEG Annual Meeting, University of California, Irvine, CA**  
"A coalescent approach to effective population size in clonal organisms."

#### OTHER INVITED PRESENTATIONS

- Feb. 10, 2023 **Center for Faculty Development and Mentoring, University of Kansas**  
"Navigating conflict: Some lessons from 12 years in a university ombuds office."
- May 3, 2022 **Association for Women in Mathematics, University of Kansas**  
"Replicating viruses and adapting clones: Making sense of biology with mathematics."
- Feb. 9, 2018 **Red Hot Research No. 45: Representation/Participation, The Commons, University of Kansas**  
"Uniformity or variability: reproducing in a changing environment."
- Aug. 18, 2011 **KU Teaching Summit, University of Kansas**  
"What being an Ombudsman has taught me about teaching."
- March 2, 2011 **Department of Mathematics Math Club, University of Kansas**  
"Mathematical models in population genetics."
- June 29, 2010 **Undergraduate Diversity Program at Evolution 2010 (sponsored by NSF and NESCent), Portland, OR**  
"Undergraduate Futures Talk: 5 Things I Thought Were True About a Future in Evolutionary Biology"
- Nov. 6, 2006 **Association for Women in Mathematics, University of Kansas**  
"Mathematical models in population genetics."

#### GRADUATE STUDENTS

- Mayowa Ojo**, MS, 2019 (co-advised with F.B. Augusto)  
Mathematical modeling of *Neisseria meningitidis*: a case study of Nigeria.
- Tara Marriage**, PhD, 2009 (co-advised with J.K. Kelly), Lecturer, University of Kansas  
Mutation, asexual reproduction and genetic load: A study in three parts.
- Qinqin Gong**, MS, 2009 (co-advised with J.K. Kelly)  
The effects of directional epistasis on molecular evolution.
- Elizabeth Slade**, MS, 2007 (co-advised with J.K. Kelly)  
A comparison of models of persistent infection: Predicting key features of early HIV infection.
- Linda Wachsberg**, MS, 2006  
Effect of population subdivision on the management of captive species: a computer simulation approach.
- Scott Williamson**, PhD, 2003, Assistant Professor, Dept. of Biological Statistics and Computational Biology, Cornell University (deceased)  
Detecting natural selection from patterns of polymorphism and divergence.

#### UNDERGRADUATE RESEARCHERS

- Isabelle Cristofani**, 2022 – present  
Mathematical modeling in the biological sciences
- Seth Pua**, 2021 – present (Haskell Indian Nations University, University of Kansas)  
NIH Bridge Program, NIH MARC Program  
Model of a multiple plant host – fungal pathogen system.



**Kat Frenzel**, 2019 – 2020

KU Emerging Scholars Program

Simulation modeling using C programming language.

**Anna Goddard**, 2018 – 2020

Initiative for Maximizing Student Diversity (IMSD), KU Undergraduate Research Award

Selection on relative amounts of clonal and sexual reproduction in populations with mixed sexual/asexual reproduction and stage structure.

**Caroline Hwang**, 2017 – 2018

KU Emerging Scholars Program

Simulation modeling using C programming language.

**Mackenzie Johnson**, 2014 – 2017; *Biology Honors*

Undergraduate Biology Program Research Award, KU Undergraduate Research

Award, Undergraduate Diversity at Evolution Award

The effect of deleterious mutations and finite genome size on clonal interference and the rate of evolution.

**Lauren Melcher** (Texas A&M University – Commerce), Summer 2017

KU EEB REU Program

Consideration of a distribution of selective effects for beneficial and deleterious mutations in simulations of clonal interference.

**Gabriel Haas**, 2015

Mathematical modeling in epidemiology and population dynamics.

**Carlos Fernandez**, 2013 – 2015

Initiative for Maximizing Student Diversity (IMSD), McNair Scholars Program

Models of the evolution of stage-structured populations with clonal reproduction.

**Lei Wei** (Wellesley College), Summer 2014

KU EEB REU Program

Clonal interference: combining multiple-loci and varying beneficial mutation effects.

**Stephen Rong** (Washington University), Summer 2013

KU EEB REU Program

Modeling host-endosymbiont population genetics, the limit of low symbiont uptake.

**Julio Ramirez**, 2012 – 2014; *Biology Honors*

Initiative for Maximizing Student Diversity (IMSD), KU Undergraduate Research

Award, Undergraduate Diversity at Evolution Award

Simulation studies of mutation-selection balance with sexual and asexual reproduction.

**Elisa Rosales**, 2009 – 2010

Initiative for Maximizing Student Diversity (IMSD)

Dynamical models of host-virus interaction.

**Rachel Debes**, 2006 – 2009; *Mathematics Honors*

Initiative for Maximizing Student Diversity (IMSD)

Modeling dynamics of viral infection; combining within-host structure with cellular immune response.

**Megan Denchfield**, 2006

Numerical analysis of the effects of somatic mutation.

## TEACHING EXPERIENCE

### *University of Kansas*

Genetics, Population Genetics, Biostatistics, Scientific Integrity, Evolutionary

Mechanisms, Coalescent Theory, Sexual and Asexual Reproduction, Senior Seminar in

Genetics, Seminar on the History of Population Genetics, Freshman Honors Tutorial

***University of Edinburgh***

Tutorials in Evolutionary and Ecological Genetics

***University of Georgia***

Evolutionary Genetics (Guest Lecturer, graduate level)

***University of California, Berkeley***

Population Genetics (Lecturer), General Biology (Graduate Student Instructor),

Population Genetics (Graduate Student Instructor)

***Stanford University***

Biostatistics (Course Assistant), Biology for Non-Majors (Head Teaching Assistant),

Human Behavioral Biology (Teaching Assistant), Center for Teaching and Learning

(Tutor)

**OTHER TEACHING ACTIVITIES**

***Catalysis Meeting, National Evolutionary Synthesis Center (NESCent), Durham, NC, “K-12 Evolution Education and the Underserved” (April 18-20, 2013)*** – presentations, discussion, and break-out sessions on the topic of evolutionary education in underserved/underrepresented communities. Meeting resulting in preparation and submission of a collaborative NSF research proposal (for which I served as PI for the KU component) “A Longitudinal Study of STEM Majors: Impact on Underrepresented Minorities in Evolutionary Science Careers”, submitted in January 2014 (declined for funding).

***Faculty Seminar, Center for Teaching Excellence (CTE), University of Kansas (Fall 2012) – collaborative project with J. Hall (Communication Studies)*** – development of online statistics modules for summer statistics courses; activities included 5 seminar meetings in Fall 2012 during which participants read and discussed literature, listened to presentations on online and hybrid courses, and developed and presented teaching ideas.

***Spencer/Teagle Project, CTE, University of Kansas, “Statistics in Primary Literature” (2010 – 2011)*** – one of 4 faculty members chosen to develop methods to enhance writing and critical thinking in undergraduate courses at KU; activities included participation in Spencer/Teagle Faculty Seminar, planning library-use aspect of course redesign, selection of Graduate Student Teaching Fellow for project, preparation of new materials for Biol 570, analysis of results.

***Faculty Fellowship (\$1500 to D. Smith and M. Orive), CTE, University of Kansas, “Tracking learning and retention of a fundamental biological concept across three courses: Hardy-Weinberg Equilibrium” (2007 – 2008)*** – activities included tracking student learning and retention across 3 courses (Intro. Biology, Genetics, and Evolution), carrying out assessment, analysis of results, and development of Blackboard modules for use in other courses. Results presented in 2 sessions at the KU Summit on Teaching, CTE, 8/14/07, titled “Learning Across the Curriculum”, giving overview project and discussing how similar projects could be undertaken to assess curriculum-level learning and retention.

***Best Practices in Teaching: Institute 2000, CTE, University of Kansas (May 23-24, 2000)*** – activities included discussions and presentations on learning in large classrooms, active learning, and use of technology to increase student engagement. During the Institute, I developed learning modules that later became discussion session activities for my introductory genetics course (now Biol 350).

## **SERVICE/PROFESSIONAL SOCIETIES**

### ***Leadership Positions/Elected Council and Board Memberships:***

Society for the Study of Evolution (SSE) Council, 2021 – 2023  
American Genetic Association, President-elect/President/Past-president, 2018 – 2020  
Friends of the Lied Center Board of Directors, 2013 – 2016  
American Genetic Association Council, 2013 – 2015  
National Evolutionary Synthesis Center (NESCent) Advisory Board (Associate Chair),  
2008 – 2011

### ***Editorial Positions:***

*Evolution*, Associate Editor, 2022 – present  
*Journal of Heredity*, Associate Editor (Special Issue, 2019 President's Symposium), 2019  
– 2021  
*American Naturalist*, Associate Editor, 2018 – 2021  
*Encyclopedia of Evolutionary Biology* (Elsevier), Population Genetics Section Editor,  
2013 – 2016  
*Genetica*, Associate Editor, 1998 – 2013

### ***Review Panels:***

NSF Evolutionary Genetics Pre-Proposal Panel, 2016  
NSF Science & Technology Centers Pre-Proposal Panel, 2015  
NSF Evolutionary Genetics Full Proposal Panel, 2012  
NSF Evolutionary Ecology Pre-Proposal Panel, 2012  
NSF Advancing Theory in Biology Panel, 2009  
NSF Evolutionary Genetics Panel, 2007  
NSF Evolutionary Genetics Panel, 2006  
NSF Evolutionary Genetics Panel, 2005  
NSF Evolutionary Genetics Panel, 2004  
NSF Doctoral Dissertation Improvement Grants Panel, 2002

### ***National/International Service:***

Undergraduate Diversity at Evolution Program, Organizing Team, 2023 – present  
Society for the Study of Evolution (SSE) Diversity Committee, 2017 – 2020, 2021 –  
2023  
SSE Constitution and Bylaws Ad Hoc Committee, 2021 – 2022  
American Society of Naturalists (ASN), Nominations Committee, 2018 – 2022 (Chair,  
2020)  
European Society for Evolutionary Biology (ESEB), Equal Opportunities Committee,  
Co-Chair Data Task Group, 2015 – 2018

### ***University/College Service:***

KU Center for Genomics Post-Doctoral Fellowship Committee (Chair), 2022 – present  
Associate Vice Chancellor for Research Search Committee (Chair), 2022  
KU Office of Research Higuchi Biosciences Center Taskforce, 2022  
KU Center for Genomics Advisory Committee, 2021 – present  
KU Office of Research ITTC Review Committee, 2021  
College of Liberal Arts & Sciences (CLAS) Associate Dean for Social & Behavioral  
Sciences Search Committee (Chair), 2021  
rpk/KU Academic Data Workshops, 2020  
Kansas Biological Survey (KBS) Director Search Committee, 2018 – 2019  
Anthropology Department Chair Search Committee, 2018 – 2019  
University Ombuds Search Committee, 2017  
Procession Marshal, KU Commencement, 2015 – 2016

University Core Curriculum Satellite Committee, 2011  
CLAS Sabbatical Leave Committee, 2009 – 2011  
Vice Provost for Faculty Support Search Committee, 2006  
University Academic Policies and Procedures Committee (Chair), 2005 – 2007  
University Council 2003 – 2006

***Faculty Sponsor:***

Association for Women in Science (AWIS), Univ. of Kansas Chapter, 1998 – 2005

***Examples of Division/Department Service:***

EEB By-Laws Committee, 2021 – 2022  
EEB Executive Committee, 2011 – 2021  
EEB Post-tenure Review Committee (Chair), 2014 – 2019  
EEB General Research Fund Committee (Chair), 2012 – 2019  
Biological Sciences Alumni Advisory Board (BSAB), Faculty Liaison, 2012 – 2019  
BSAB Alumni/Public Relations Committee (Co-Chair), 2014 – 2019  
EEB Merit Review Committee, 2012 – 2019  
EEB Self-Study Committee (Co-Chair), 2017  
EEB Diversity Development Committee (Chair), 2009 – 2011  
EEB Sabbatical Committee, 2008 – 2009 (Chair), 2010 – 2011  
Undergraduate Biology Committee (Division of Biological Sciences), 2001 – 2003, 2006  
– 2007, 2009 – 2010  
EEB By-Laws Committee, 2006 – 2007  
EEB Curriculum Committee, 2002 – 2003, 2004 – 2005  
EEB Undergraduate Education and Research Committee (Chair), 2003 – 2004  
EEB Evolution/Developmental Biology Search (Chair), 2003 – 2004  
Genetics Program Executive Committee, 2002 – 2004  
EEB Minority Affairs Committee, 1998 – 2001

***Reviewer:***

American Naturalist	Journal of Ecology
Biometrics	Journal of Theoretical Biology
Ecology	Molecular Biology and Evolution
Evolution	Science Advances
Evolution Letters	Genetica
Frontiers in Genetics	Genetical Research
Genetics	Theoretical Population Biology

***Member:***

American Association for the Advancement of Science	Faculty Retention Outreach Group (FROGs), University of Kansas
American Genetic Association	Scientists of Color, UC Berkeley
American Society of Naturalists	Sigma Xi
Association for Women in Science	Society for the Study of Evolution