

Katya L. Mack

Tel.: (847) 345-4393 • Email: katya.mack@gmail.com
Google Scholar: <https://tinyurl.com/52c8e7xe> • Website: www.katyamack.com

APPOINTMENTS

University of Kansas , Department of Ecology and Evolutionary Biology Assistant Professor	2024
Stanford University , Department of Biology National Institute of Health NRSA Postdoctoral Fellow Center for Computational, Evolutionary, and Human Genomics Postdoctoral Fellow Supervisor: Dr. Hunter Fraser	2019-2023
University of California, Berkeley , Department of Integrative Biology & Museum of Vertebrate Zoology PhD student, supervisor: Dr. Michael Nachman	2013-2018
University of Michigan, Ann Arbor Research assistant, supervisor: Dr. Patricia Wittkopp	2011-2012
Field Museum , Human Origins Department Undergraduate Intern, supervisor: Dr. Robert Martin	2009, 2010

EDUCATION

University of California, Berkeley, CA Ph.D., Integrative Biology Advisor: Dr. Michael Nachman	2013-2018
University of Michigan, Ann Arbor, MI Anthropology B.S., Ecology and Evolutionary Biology Minor, Highest Honors and Distinction	2008-2012

PUBLICATIONS

*Contributed equally

14. **Mack KL***, Talbott HE*, Griffin MF*, Parker JB, Guardino NJ, Spielman AF, *et al.* 2023. Allele-specific expression reveals genetic drivers of tissue regeneration in mice. *Cell Stem Cell*, 30(10):1368-1381.
13. Ballinger MA*, **Mack KL***, Durkin SM, Ridell EA, Nachman MW. *Cis*-regulatory changes are environmentally stable and underlie rapid climatic adaptation in wild mice. *Proceedings of the National Academy of Sciences*, 120.39 (2023): e2214614120.
12. **Mack KL**, Square TA, Zhao B, Miller CT, Fraser HB. 2023. Evolution of spatial and temporal *cis*-regulatory divergence between marine and freshwater sticklebacks. *Molecular Biology and Evolution*, msad034.

11. Bittner NKJ, **Mack KL**, and Nachman MW. 2022. Shared patterns of gene expression and protein evolution associated with adaptation to desert environments in rodents. *Genome Biology and Evolution*, *evac155*.
10. **Mack KL**, Jaggard JB, Persons JL, Roback EY, Passow CN, Stanhope BA, Ferrufino E, Tsuchiya D, Smith SE, Slaughter BD, Kowalko J. 2021. Repeated evolution of circadian clock dysregulation in cavefish populations. *PLoS genetics* 17(7):e1009642.
9. Bittner NKJ, **Mack KL**, and Nachman MW. 2021. Gene expression plasticity and desert adaptation in house mice. *Evolution* 75(6): 1477-1491.
8. Suzuki TA, Phifer-Rixey M, **Mack KL**, Sheehan MJ, Lin TT, Bi K, Nachman MW. 2019. Host genetic determinants of the gut microbiota of wild mice. *Molecular Ecology* 13: 3197-3207. (*F1000 recommended*)
7. **Mack KL**, Phifer-Rixey M, Harr B, Nachman MW. 2019. Gene expression networks across multiple tissues are associated with rates of molecular evolution in wild house mice. *Genes* 10(3): 225.
6. **Mack KL**, Ballinger MA, Phifer-Rixey M, Nachman MW. 2018. Gene regulation underlies environmental adaptation in house mice. *Genome research* 28:1636-1645.
5. Phifer-Rixey M, Bi K, Ferris KG, Sheehan MJ, Lin D, **Mack KL**, Keeble SM, Suzuki TA, Good JM, and Nachman MW. 2018. The genomic basis of environmental adaptation in house mice. *PLoS genetics* 14:e1007672.
4. **Mack KL** and Nachman MW. 2017. Gene regulation and speciation. *Trends in Genetics* 33: 68–80.
3. **Mack KL**, Campbell P, Nachman MW. 2016. Gene regulation and speciation in house mice. *Genome research* 26: 451-461.
2. Holmes MW, Hammond TT, Wogan GO, Walsh RE, LaBarbera K, Wommack EA, Martins FM, Crawford JC, **Mack KL**, Bloch LM, Nachman MW. 2016. Natural history collections as windows on evolutionary processes. *Molecular ecology* 25: 864-881.
1. Duveau F, Metzger BP, Gruber JD, **Mack K**, Sood N, Brooks TE, Wittkopp PJ. 2014. Mapping small effect mutations in *Saccharomyces cerevisiae*: impacts of experimental design and mutational properties. *G3: Genes | Genomes | Genetics* g3-114.

SELECTED PRESENTATIONS

Selected conference presentations

2023. “Evolution of spatial and temporal *cis*-regulatory divergence between marine and freshwater sticklebacks.” Society for the Study of Evolution, Albuquerque, New Mexico (Talk).
2023. “Evolution of spatial and temporal *cis*-regulatory divergence between marine and freshwater sticklebacks.” Gordon Conference on Speciation: The Origin and Persistence of Species, Tuscany, Italy. (Poster).
2020. “Repeated evolution of circadian clock dysregulation in cavefish populations.” The Allied Genetics Conference (TAGC), Online due to COVID-19 (Talk).
2018. “The genomic basis of environmental adaptation in house mice.” Joint ASN/SSB/SSE/ESEB meeting, Montpellier, FR (Talk).

2018. “Copy number variation in natural populations of house mice (*Mus musculus domesticus*) along an environmental gradient.” Population, Evolutionary and Quantitative Genetics Conference, Madison, WI (Poster).
2018. “Adaptive variation in gene regulation in mice.” Society for Integrative and Comparative Biology, San Francisco, CA (Talk).
2016. “Environmental adaptation in house mice: the role of gene regulation along a latitudinal cline.” Society for the Study of Evolution, Portland, OR (Talk).
2016. “A role for disrupted gene regulation in speciation in house mice.” Society for the Study of Evolution, Austin, TX (Talk).
2015. “Divergence in gene regulation associated with reproductive isolation in house mice.” Genetics, Development & Evolution Symposium, 2015, Berkeley, CA (Talk).
2014. “Divergence in gene regulation associated with reproductive isolation in house mice.” Society for the Study of Evolution, Raleigh, NC (Talk).

Invited talks

2024. “Allele-specific expression reveals genetic drivers of tissue regeneration in mice.” Nexus Informatics Conference, Children’s Mercy Hospital, Kansas City, MO.
2023. “Genetics of speciation - from simple incompatibilities to complex traits.” Gordon Research Seminar on Speciation. Tuscany, Italy.
2023. “Complex trait evolution through the lens of gene regulation.” The University of Nebraska, Lincoln, NE.
2023. “Complex trait evolution through the lens of gene regulation.” Princeton University, Princeton, NJ.
2021. “Complex trait evolution through the lens of gene regulation.” University of Chicago, IL (online).
2020. “Gene expression regulation and environmental adaptation.” PEEC seminar, University of Illinois, Urbana-Champaign, IL (online).
2018. “Gene regulation in speciation and adaptation.” Duke University, Durham, NC.
2017. “Environmental adaptation in house mice: the role of gene regulation along a latitudinal cline.” UC Berkeley, Berkeley, CA.
2017. “A role for regulatory evolution in house mouse adaptation and speciation.” Center for Population Biology Seminar Series. UC Davis, Davis, CA.
2015. “Gene regulation and speciation in house mice. Integrative Biology Seminar Series.” UC Berkeley, Berkeley, CA.

GRANTS AWARDED

- 2024-2025 **National Institute of Health** NIH Center of Biomedical Research Excellence (COBRE) Phase III: “The Gene Regulatory Basis of Metabolic Evolution in Mice”, PI: KL Mack (Direct: \$109,187)
- 2016 **National Science Foundation** DEB:1601699: “Gene Regulation Evolution and Speciation in House Mice” (Doctorate Dissertation Improvement Grant), Co-PI: Nachman, Michael (Thesis advisor) (\$20,357)

HONORS AND AWARDS

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| National Institute of Health NRSA Postdoctoral Fellowship (\$192,170) | 2019 |
| National Science Foundation Postdoctoral Fellowship in Biology
(<i>declined</i>) (\$138,000) | 2019 |
| Center for Computational, Evolutionary, and Human Genomics Postdoctoral Fellowship
Stanford University, CA (\$30,000) | 2019 |
| Jerry O. Wolff Graduate Student Fellowship (\$11,000) | 2017 |

Museum of Vertebrate Zoology, UC Berkeley, CA	
Integrative Biology Research Grant, UC Berkeley (\$1,929)	2015
David and Marvalee Wake Fund Grant, UC Berkeley (\$2,000)	2015
Reshetko Family Scholarship Grant, UC Berkeley (\$2,061)	2015
Louise Kellogg Fund Grant, UC Berkeley (\$2,000)	2014

TEACHING EXPERIENCE

COURSES TAUGHT

BIOL 412: *Evolutionary Biology* (core undergraduate course, ca. 200 students); 4 credits (team-taught: 50%), University of Kansas (Spring 2024)

GUEST LECTURES

Cold Spring Harbor Laboratory, Watson School of Biological Sciences (2018)

- Instructor, Population Genetics, Evolution Topics Course

Monmouth University, Department of Biology (2018, 2019)

- Guest lecturer, Evolution course

WORKSHOPS TAUGHT

UC Berkeley, Computational Genomics Resource Laboratory (2016, 2017, 2018)

- Instructor, developed and taught five workshops on data analysis for computational genomics for the UC Berkeley Computation Resource Laboratory
- Workshops: (1) Introduction to gene expression analysis, (2) RNA-seq for eukaryotic organisms, (2) RNA-seq workshop for model and non-model systems (x 2), (3) RNAseq workshop: from FASTQ files to differential expression

TEACHING ASSISTANTSHIPS

UC Berkeley, Department of Integrative Biology (2013-2018)

- Graduate Student Instructor: Human Genetics (2018), Evolutionary Medicine (2015, 2017), Evolution and Earth History: From Genes to Fossils (2016), General Biology (2013, 2014, 2015, 2016, 2018)
- Guest lecturer, Evolution and Earth History: From Genes to Fossils (IB167) (2016)

University of Michigan, Ann Arbor, Science Learning Center (2011-2012)

- Study Group Facilitator for the Science Learning Center, Introductory Biology (Molecular, Cellular, and Developmental) course

SERVICE AND OUTREACH

1. Mentoring undergraduates in research:

- Mentored undergraduates through the UC Berkeley's Undergraduate Research Apprenticeship Program (URAP) and in individual research projects (2016-2022)
- Primary postdoctoral mentor for a graduate rotation student, Fraser Lab, Stanford (2019)

2. Science outreach & education:

- Volunteer teacher in Berkeley middle schools through the Community Resources for Science "Be A Scientist" program (for K-12 students) (2017-2018)
- Mentor and volunteer for Stanford University Biology Preview Program (geared towards undergraduates applying to biology PhD programs from diverse backgrounds) (2019-2022)

- Pen pal for Letters to a Pre-Scientist program (for K-12 students) (2019-2021)
- Volunteer and presenter at UC Berkeley's campus outreach event CalDay (2014-2018)

3. Resource and curriculum development:

- Developed and taught 5 freely available and online accessible workshops for the UC Berkeley Computational Genomics Resource Laboratory
- Developed course material for the graduate student evolution course at Cold Spring Harbor Laboratory
- Created and presented guest lectures for courses at UC Berkeley and Monmouth University, NJ

4. Service to scientific community:

- Session chair for Early Career Gordon Research Seminar (Speciation 2022, topic: Genetics of speciation - from simple incompatibilities to complex traits)
- Student representative for Quantitative Systems Biology Search committee, UC Berkeley
- Manuscript reviewer for scientific journals including Genetics, Molecular Biology and Evolution, Biology Letters, Evolution Letters, Molecular Ecology, PLoS Genetics