UnJin Lee, PhD

New York, NY 10065
email: linuxlife@gmail.com
orcid: 0000-0003-2424-650X
web: unjinlee.com

Positions

2024-	Postdoctoral Fellow, Zhao Lab, The Rockefeller University *National Science Foundation Postdoctoral Research Fellowship in Biology*
2022-2024	Postdoctoral Associate, Zhao Lab, The Rockefeller University

Education

PhD, MS University of Chicago
Committee on Genetics, Genomics, and Systems Biology, 12/2021
On the Mechanisms of Genomic and Phenotypic Evolution
Advisor: Manyuan Long

BA, University of Chicago
Physics, 2013

Research Experience

Publications

C. Thompson, S. Mozeika, E. Paredes, **U. Lee**†, Korean Natural Farming practices are dominated by a limited number of microbes and decrease fungal diversity. (to be submitted at Journal of Soil Science and Plant Nutrition) preprint

U. Lee, C. Li, C. B. Langer, N. Svetec, L. Zhao, Comparative single cell analysis of transcriptional bursting reveals the role of genome organization on de novo transcript origination. *PNAS,* **122**(18):e2425618122 (2025) pubmed

U. Lee†*, D. Arsala*, S. Xia*, C. Li, M. Ali, N. Svetec, C.B. Langer, D. Sobreira, I. Eres, D. Sosa, J. Chen, L.Zhang, P. Reilly, A. Guzzetta, J.J. Emerson, P. Andolfatto, Q. Zhou, L. Zhao, M. Long. The 3-Dimensional Genome Drives the Evolution of Asymmetric Gene Duplicates via Enhancer Capture-Divergence. *Science Advances,* **10**, eadn6625 (2024) pubmed

U. Lee, S. Mozeika, L. Zhao, A Synergistic, Cultivator Model of De Novo Gene Origination. *Genome Biology and Evolution*. evae103 (2024). pubmed

U. Lee†, E. N. Mortola, M. Long, E. Kim. Evolution and maintenance of phenotypic plasticity. *BioSystems*. **222**, 104791 (2022). pubmed

S. Xia, N. W. VanKuren, C. Chen, L. Zhang, C. Kemkemer, Y. Shao, H. Jia, **U. Lee**, A. S. Advani, A. Gschwend, M. D. Vibranovski, S. Chen, Y. E. Zhang, M. Long, Genomic analyses of new genes and their phenotypic effects reveal rapid evolution of essential functions in Drosophila development. *PLOS Genetics*. **17**, e1009654 (2021). pubmed

J. Zu, Y. Gu, Y. Li, C. Li, W. Zhang, Y. Zhang, **U. Lee**, L. Zhang, M. Long, Topological evolution of coexpression networks by new gene integration maintains the hierarchical and modular structures in human ancestors. *Science China Life Sciences*. **62** (2019). pubmed

E. Leypunskiy, J. Lin, H. Yoo, **U. Lee**, A. R. Dinner, M. J. Rust, The cyanobacterial circadian clock follows midday in vivo and in vitro. *eLife*. **6**, e23539 (2017). pubmed

E. Kim, **U. Lee**, J. Heseltine, R. Hollerbach, Geometric structure and geodesic in a solvable model of nonequilibrium process. *Phys. Rev. E*. **93**, 062127 (2016). pubmed

U. Lee†, J. J. Skinner, J. Reinitz, M. R. Rosner, E.-J. Kim, Noise-driven phenotypic heterogeneity with finite correlation time in clonal populations. *PLOS ONE*. **10**, e0132397 (2015). pubmed

U. Lee*, C. Frankenberger*, J. Yun, E. Bevilacqua, C. Caldas, S.-F. Chin, O. M. Rueda, J. Reinitz, M. R. Rosner, A prognostic gene signature for metastasis-free survival of triple negative breast cancer patients. *PLOS ONE*. **8**, e82125 (2013). pubmed

*contributed equally

†corresponding author

Presentations

2025 — 66th Annual Drosophila Research Conference
Single-cell research in Drosophila: technologies and resources workshop
San Diego, CA
scHSQ allows for the alignment of evolutionarily diverged tissue types (invited workshop talk)

2024 — NY Area Population Genetics Meeting
New York City, NY
Comparative scRNA-Seq analysis of Drosophila spermatogenesis reveals critical role of genome organization in de novo transcript origination (selected talk)

2023 — SMBE Satellite Meeting on De Novo Genes
College Station, TX
Origination of a Testis-Specific lncRNA (poster, ***best presentation award****)*

2022 — NY Area Population Genetics Meeting
New York City, NY
Evolution and Maintenance of Phenotypic Plasticity (poster)
The Role of the 3D Genome in New Gene Evolution (poster)

2019 — Midwest Population Genetics Meeting
Chicago, IL
Evolutionary Consequences of Phenotypic Diversification (selected talk)

2019 — Gordon Conference on Ecological and Evolutionary Genomics
Manchester, NH
Regulatory Evol. of a New Essential Gene is Driven by an Old Enhancer (poster)

2016 — Aspen Center for Physics on Evolution, Populations, and Physics
Aspen, CO
Selection Over a Model of Noise-Driven Phenotypic Heterogeneity (poster)

2013 — American Association of Cancer Researchers Annual Conference
Washington, DC
A Prognostic Gene Sig. for Metastasis-Free Survival of TNBC Patients (poster)

Awards and Honors

2024-2027 NSF Postdoctoral Research Fellowship in Biology Recipient
2023 Best Presentation Award, SMBE Satellite Meeting on De Novo Genes
2023 SMBE Satellite Meeting on De Novo Genes Travel Award
2017-2021 Ridgeway Endowment Support
2017 Hinds Evolutionary Biology Graduate Student Research Award
2016 NSF Graduate Research Fellowship Program Honorable Mention
2015-2017 NIH T32 Gene Regulation Training Grant Recipient
2011 NSF Res. Experiences for Undergraduates, Chicago Center for Systems Biology
2008-2013 Odyssey Scholarship Recipient, University of Chicago

Service Activities

Outreach

Summ. 2023	RockEDU SSRP Mentor
Spring 2023	Genspace FIT Scholar Program Mentor
2017-2019	EE Just Portrait Commission
2016-2018	Co-Host Groks Science Radio Hour WHPK 88.5FM
2015-2016	Genetics Science Connections at Museum of Science and Industry

Professional

2023-	Rockefeller University Sustainability Committee Laboratory Representative
2023-2024	Rockefeller University Post-Doc Association Board Member
2022-	Rockefeller Inclusive Science Initiative Executive Board Member (Mental Health and Accessibility Coordinator 2023-)
2017-2018	BSD Equipment Library Committee (Founder)
2017-2019	BSD Travel Award Committee (Member, Chair 2018-2019)
2014-2019	Dean's Council Representative
2014-2016	Program Representative (GGSB)

Teaching

Instruction

Fall 2023	Workshop Instructor, Genspace ("*Introduction to Bioinformatics*")
Spring 2023	Workshop Instructor, RockEDU SSRP ("*Introduction to Molecular Evolution*"; "*Detecting Signatures of Selection*"; "*Genetic Sources of Phenotypic Diversity*")
Spring 2023	Workshop Instructor, Genspace ("*Introduction to Bioinformatics*")
Winter 2018	Grader, University of Chicago ("*Fundamentals of Genetics*")
Spring 2017	Teaching Assistant, University of Chicago ("*Classics of Evolutionary Genetics*")
Winter 2017	Grader, University of Chicago ("*Fundamentals of Genetics*")
Fall 2016	Teaching Assistant, University of Chicago ("*Developmental Biology*")

Trainees

2024-	Candance Thompson (*"Microbial Community Propagation Through Korean Natural Farming Practices Decreases Fungal Diversity and Increases Microbial Diversity")*
Summ. 2023	Yifei Zhou ("*Ablation & Genesis: Comparative Genetic Analysis of Behavioral Preference in an Invasive Pest Species*"
Summ. 2023	Finn Charest ("*Randomness is the Spice of Life: Examining Stochastic Fluctuations in Lotka-Volterra Models*")
Summ. 2023	Bharat Elango ("*Machine Learning-Based Analysis of Gene Expression in D. melanogaster*")
Spring 2023	Kiera Derrig ("*Curating My Arsenal of Colorants with Bacteria*")
Summ. 2019	Gustavo Rangel T. de Almeida ("*Numerical Optimization Methods in Python*")
2017-2019	Jack Mortola ("*Regulatory Evolution of a New Essential Gene is Driven by an Old Enhancer*")

Professional Skills Development

Summ. 2025	Academic Job Search Boot Camp *Participant*
Summ. 2024	Tri-Institutional Transitioning to Research Independence Series *Participant*
Summ. 2024	Managing Science and Scientists Workshop *Invited Alumni Panelist*

Summ. 2023 Managing Science and Scientists Workshop
Three day management workshop taught by Harvard Business School and Haas School of Business faculty
Workshop Participant (Inaugural)

Scientific Software

sigsquared (Bioconductor/R package)
scHSQ (R package)

Intellectual Property

Prognostic and predictive breast cancer signature (M. Rosner, M. Sun, **U. Lee,** USPTO 14/952,265)

Peer Review

PLoS Computational Biology, Cancer Cell International (Springer), National Science Foundation (*ad hoc* reviewer), PNAS

References

Manyuan Long, PhD
Edna K. Papazian Distinguished Service Professor
Department of Ecology and Evolution
Doctoral Advisor
mlong@uchicago.edu

Li Zhao, PhD
Associate Professor
Laboratory of Evolutionary Genetics and Genomics
Postdoctoral Advisor
lzhao@rockefeller.edu

John Reinitz, PhD (d. 2025)
Professor
Departments of Statistics, Ecology & Evolution, Molecular Genetics & Cell Biology
Undergraduate Advisor and PhD Thesis Committee Member
c/o
Alexandre Ferreira Ramos, PhD
Professor
School of Arts, Sciences, and Humanities
Laboratory of Applied Mathematics and Physical Biology
Former student of John Reinitz
alex.ramos@usp.br