CV

Emily S. Bellis (née Weiss)

# EDUCATION

*Oregon State University, Corvallis, OR*, Ph.D. Integrative Biology

*Texas A&M University, College Station, TX*, B.S. Genetics & Biochemistry

# APPOINTMENTS

*Arkansas State University, Jonesboro, AR:*

Associate Director, Center for No-Boundary Thinking Division Lead, CNBT Division of Biological Systems   
Assistant Professor of Bioinformatics   
Research Assistant Professor of Bioinformatics

*The Pennsylvania State University, State College, PA:*

NSF Nat’l Plant Genome Postdoctoral Research Fellow

*Reed College, Portland, OR:*

Postdoctoral Research Associate in Genomics

# RESEARCH INTERESTS

Genomic basis of genotype-phenotype-environment interactions; machine learning; data science; plant biology; agriculture

# SELECTED PUBLICATIONS

## Peer-reviewed

1. **E.S. Bellis\***, C.M. McLaughlin\*, C.W. dePamphilis, & J.R. Lasky (2021). The geography of parasite local adaptation to host communities. *Ecography* 44: 1-13. \*co-first authors.
2. J. Masanga, B. N. Mwangi, W. Kibet, M. Wamalwa, P. Sagero, R. Oduor, M. Ngugi, A. Alakonya, P. Ojola, **E. Bellis**, S. Runo (2021). Physiological and ecological warnings that Dodder pose an exigent threat to farmlands in Eastern Africa. *Plant Physiology* 0: 1-11.
3. **E.S. Bellis**, E.A. Kelly, C.M. Lorts, H. Gao, V.L. Deleo, G. Rouhan, A. Budden, G.B. Bhaskara, Z. Hu, R. Muscarella, M.P. Timko, B. Nebie, S.M. Runo, N.D. Chilcoat, T.E. Juenger, G.P. Morris, C.W. dePamphilis, and J.R. Lasky (2020). Genomics of sorghum local adaptation to a parasitic plant. *PNAS* 117: 4243-4251.
4. R.M. Gutaker, S.C. Groen, **E.S. Bellis**, J.Y. Choi, I.S. Pires, R.K. Bocinsky, E. Slayton, O. Wilkins, C.C. Castillo, S. Negrao, M.M. Oliveira, D.Q. Fuller, J.A. d’Alpoim Guedes, J.R. Lasky, and M.D. Purugganan (2020). Genomic history and ecology of the geographic spread of rice. *Nature Plants* 6: 492-502.
5. J. Stubblefield, M. Hervert, J. Causey, J. Qualls, W. Dong, L. Cai, J. Fowler, **E. Bellis**, K. Walker, J.H. Moore, S. Nehring, X. Huang (2020). Cardiac or infectious? Transfer learning with chest X-rays for ER patient classification. *Scientific Reports* 10: 20900.
6. R.D. Lucardi, **E.S. Bellis**, C.E. Cunard, J.K. Gravesande, S.C. Hughes, L.E. Whitehurst, S.J. Worthy, K.S. Burgess, T.D. Marsico. (2020). Seeds attached to refrigerated shipping containers represent a substantial risk of nonnative plant species introduction and establishment. *Scientific Reports* 10: 15017.
7. L. Lopez, K. Turner, **E.S. Bellis**, & J.R. Lasky. (2020). Genomics of natural history collections for understanding evolution in the wild. *Molecular Ecology Resources* 20: 1153-1160.
8. J.S. Shaver, **E.S. Bellis**, C. Iwaki, J. Qualls, J. Randolph, & J. Smith. (2020). Massard prairie restoration and soil microbiome succession. *Journal of the Arkansas Academy of Science.*
9. M. Staton, C. Addo-Quaye, [and 29 others including **E.S. Bellis**]. (2020). A reference genome assembly and adaptive trait analysis of *Castanea mollissima* ‘Vanuxem’, a source of resistance to chestnut blight in restoration breeding. *Tree Genetics & Genomes* 16: 57.
10. L. Lopez, **E.S. Bellis**, E. Wafula, S. Hearne, L. Honaas, P. Ralph, N. Unachukwu, C.W. dePamphilis, and J.R. Lasky (2019). Transcriptomics of host-specific interactions in natural populations of the parasitic plant *Striga hermonthica. Weed Science* 67: 397-411.
11. **E.S. Bellis**, R.B. Edlund, H.K. Berrios, H.A. Lessios, and D.R. Denver (2018). Molecular signatures of host specificity linked to habitat specialization in a symbiotic sea anemone. *Ecology & Evolution* 8: 5413-5426.
12. **E.S. Bellis** and D. R. Denver (2017). Natural variation in responses to acute heat and cold stress in a sea anemone model system for coral bleaching. *Biological Bulletin* 233: 168-181. \**Cover article.*
13. **E.S. Bellis**, D.K. Howe, and D.R. Denver. Genome-wide polymorphism and signatures of selection in the symbiotic sea anemone *Aiptasia. BMC Genomics* 17: 160.
14. W.S. Phillips, A.L. Coleman-Hulbert, **E.S. Weiss**, D.K. Howe, S. Ping, R.I. Wernick, S. Estes, and D.R. Denver (2015). Selfish mitochondrial DNA proliferates in small, but not large, experimental populations of *Caenorhabditis briggsae. Genome Biology and Evolution* 7: 2023-2037.
15. A. Emblem, S. Okkenhaug, **E.S. Weiss**, D.R. Denver, B.O. Karlsen, T. Moum, and S.D. Johansen (2014). Sea anemones possess dynamic mitogenome structures. *Molecular Phylogenetics and Evolution* 75: 184-193.

## Preprints/submitted

1. **E.S. Bellis\***, A.A. Hashem\*, J.L. Causey, B.R.K. Runkle, B. Moreno-Garcia, B. Burns, V.S. Green, T.N. Burcham, M.L. Reba, X. Huang. Detecting intra-field variation in rice yield with UAV imagery and deep learning. *In review*. \*co-first authors.
2. E.K.H. Ho\*, **E.S. Bellis,\***  J. Calkins, J.R. Adrion, L.C. Latta IV, S. Schaack. Engines of change: Transposable element mutation rates are high and vary widely among genotypes and populations of *Daphnia magna. In review*. doi: <https://doi.org/10.1101/2020.09.21.307181>. \*co-first authors.
3. W. Zhou, **E. Bellis**, J. Stubblefield, J.L. Causey, J.A. Qualls, K. Walker, X. Huang (2019). Minor QTLs mining through the combination of GWAS and machine learning feature selection. doi: <https://doi.org/10.1101/702761>.

# RESEARCH GRANTS

## National

US-AID PEER Program Grant: Deploying *Striga* Smart Sorghum: The last mile ($75,000; PI: S.M. Runo; US-supported partner: Bellis)

## Regional

Arkansas Biosciences Institute Seed Grant: Correlating environmental microbial diversity to prevalence and severity of an emerging vertebrate disease ($69,609; role: co-PI)

Arkansas INBRE Collaborative Research Grant: Effect of soil microbiome succession on the prevalence of antibiotic resistance ($51,446; role: PI)

Arkansas INBRE Core Facility Voucher Award ($5,000; role: PI)

## Submitted/Pending

USDA NIFA AFRI: Quantifying risk to agroforestry from hitchhiking nonnative species via global trade routes ($749,780; submitted; role: co-PI)

NSF EPSCoR RII Track-2: Artificial intelligence for plant systems science through EPSCoR AI-Campus ($5,076,668; submitted; role: co-PI)

Arkansas NSF EPSCoR DART Seed Grant: AgAdapt: An evolutionarily-informed algorithm for genomic prediction of crop performance in novel environments ($89,194; submitted; role: PI)

NIH R35: Understanding the genotype-phenotype-environment nexus with ensemble learning ($1,378,720; not funded; role: PI)

NSF EPSCoR RII Track-2: Connecting Artificial Intelligence and Plant Biology to Understand Adaptation to Environment ($4,683,896; not funded; role: co-PI)

# FELLOWSHIPS & AWARDS

## National

Ecological Society of America NEON Early Career Scholar ($1,500)

NSF Postdoctoral Research Fellowship in Biology ($207,000)

Society for Integrative & Comparative Biology Libbie H. Hyman Memorial Scholarship ($1,500; declined)

NSF Graduate Research Fellowship ($121,000)

National Merit Scholarship ($2,500)

## Institutional

Oregon State University Paul & Mary Roberts Fellowship for the Study of Evolution ($2,500)

University of Washington Summer Institute Scholarship ($900)

Smithsonian Tropical Research Institute Short Term Fellowship ($3,000)

Oregon State University Provost’s Distinguished Fellowship ($30,000)

Texas A&M University President’s Endowed Scholarship, National Merit Recognition Award, Director’s Excellence Award, and Non-Resident Tuition Waiver ($75,000)

# INVITED TALKS

International Parasitic Plant Society Seminar Series, remote, Dec. 1   
[Loop Genomics Webinar Series](https://www.loopgenomics.com/post/webinar-effect-of-tallgrass-prairie-restoration-and-soil-microbiome-succession-on-the-prevalence-of), remote, May 12   
Penn State Center for Parasitic & Carnivorous Plants, remote, Aug. 20   
University of Memphis Earth Sciences Colloquium Series, Memphis, TN, April 17 (*cancelled due to COVID-19*)   
University of Arkansas Fort Smith STEM Seminar, Fort Smith, AR, Feb. 14   
The Pennsylvania State University Ecology Seminar, State College, PA , Sep. 13   
NSF Plant Genome Research Program Awardee Meeting, Washington D.C., Sep. 4 Society of Herbarium Curators Annual Meeting, Tucson, AZ, Aug. 1   
University of Arkansas for Medical Sciences Career Day, Little Rock, AR, Oct. 18   
Workshop on Genomics Tools for *Striga* management, Nairobi, Kenya, June 22   
Reed College Biology Department Seminar Series, Oct. 27 Coral Reef Alliance Adaptation Challenge Workshop, San Francisco, CA, April 17

# COURSES TAUGHT

## Arkansas State University

CS1114: Concepts of Programming (including Honors section)   
CS6823: Special Topics: Introduction to Statistical Learning  
(cross-listed w/ MBS6251)

## Oregon State University

Z362: Invertebrate Biology Lab (Instructor)   
MCB525: Techniques in Molecular and Cellular Biology (Instructor)  
BI213: Principles of Biology (Curriculum Development Assistant)  
BI311: Genetics (Teaching Assistant)  
BI212: Principles of Biology Lab (Teaching Assistant)  
BI211: Principles of Biology Lab (Teaching Assistant)

# STUDENT MENTORING

## Arkansas State University

D. Delgadillo, Undergraduate Researcher   
S. McCormick, Undergraduate Researcher   
A. Kronberger, Undergraduate Researcher (co-advised w/X. Huang)   
E. Soriano Chavez, Undergraduate Researcher   
A. Le’Flore, Undergraduate Researcher   
S. Rutledge, Undergraduate Researcher

## The Pennsylvania State University

T. Xia, Undergraduate Researcher (now pursuing Ph.D. at UC Davis)   
C. Yim, Undergraduate Researcher

## Oregon State University

E. Kramer, Undergraduate Researcher   
R. Edlund, Undergraduate Researcher   
A. Vercruyssen, Undergraduate Researcher   
B. VerWey, Undergraduate Researcher   
J. Seng, Undergraduate Researcher

# PROFESSIONAL SERVICE (since 2018)

## National/International

* Program committee member for 2021 ACM Conference on Bioinformatics, Computational Biology, and Health Informatics
* Facilitator for Bioinformatics Workshop at Kenyatta University, Kenya (delivered remotely due to COVID-19; 2020)
* Review Editor for *Frontiers in Plant Science* (2020 – Present)
* Panel Reviewer for the National Science Foundation (2020)
* Manuscript Reviewer for *Agronomy* (2020), *American Society of Agricultural and Biological Engineers* (2020), *Ecology Letters* (2020), *IEEE/ACM Transactions on Computational Biology and Bioinformatics* (2020), *Plant Physiology* (2020), *The Plant Journal* (2019, 2020), *Marine Biology* (2019), *Molecular Ecology Resources* (2020), *Nature Biotechnology* (2021)
* Guest Editor for *Molecular Ecology Resources* special issue (2020)

## Regional

* Led coding activity for 13 participants for the Museum of Discovery Girls in STEM program in summer 2021
* Led Arkansas Summer Research Institute session on Spatial Data Science in R in 2021
* Team coach for Arkansas AI-Campus, a hands-on training program to provide skills in machine learning to students and professionals in AR, 2020 and 2021
* Member of the Scientific Program Committee for Arkansas Bioinformatic Consortium 2020 Meeting: Artificial Intelligence in Arkansas
* Invited speaker for ~1hr session on Individual Development Plans for Graduate Student Professional Development workshop at the annual faculty and student Center for Advanced Surface Engineering (CASE) Retreat in Petit Jean, AR (Jan. 10). Event attended by ~30 graduate students from five Arkansas institutions

## Institutional

* Co-organizer of the [A-State R User Group](https://a-state-ruser.readthedocs.io/en/latest/) (2020 – Present)
* Molecular Biosciences Program Admissions Committee (2021 – Present)
* PhD Advisor for one Ph.D. student in the Molcular Biosciences Program (N. Haydt, 2021 – Present)
* Service on Advisory Committee for three Ph.D. students and one M.S. student in the Molecular Biosciences program (J. Stubblefield, 2019 – 2021; J. Fowler, 2020 – Present; L. Martin, 2020 – 2021; and B. Hale, 2020 – Present)
* Service on Advisory Committee for one M.S. student and one undergraduate honors student in the Computer Science program (S. Singh, 2021 – Present; C. Seglem, 2021 – Present)

# PROFESSIONAL DEVELOPMENT

## Research

* Botany 2019 Workshop: Using Digitized Herbarium Data in Research
* University of Washington Summer Institute 2016 (Bayesian Statistics for Genetics, MCMC for Genetics)

## Teaching

* CIRTL (Center for the Integration of Research, Teaching and Learning) Certification, Associate Level
* Completed 12 credit hours of graduate level coursework in teaching and learning theory, course design and methods, inclusivity training, and science communication