Emily S. Bellis (née Weiss)

Assistant Professor of Bioinformatics
Arkansas Biosciences Institute & Department of Computer Science
Arkansas State University, Jonesboro, AR
ebellis@astate.edu 870 972 3979 em-bellis em-bellis.github.io

EDUCATION

Oregon State University, Corvallis, OR, Ph.D. Integrative Biology 2017

Texas A&M University, College Station, TX, B.S. Genetics & Biochemistry 2010

APPOINTMENTS

Arkansas State University, Jonesboro, AR:

Associate Director, Center for No-Boundary Thinking	01/2020–Present
Division Lead, CNBT Division of Biological Systems	01/2020–Present
Assistant Professor of Bioinformatics	01/2020–Present
Research Assistant Professor of Bioinformatics	10/2019–01/2020

The Pennsylvania State University, State College, PA:

NSF Nat'l Plant Genome Postdoctoral Research Fellow	01/2018–09/2019

Reed College, Portland, OR:

Postdoctoral Research Associate in Genomics	07/2017–12/2017

RESEARCH INTERESTS

Genomic basis of genotype-phenotype-environment interactions; machine learning in the life sciences to improve food security and ecosystem health; analysis of biological data with high spatio-temporal complexity

PUBLICATIONS

Peer-reviewed

1. 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*.

2. 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.

3. 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.

4. 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.

5. J.S. Shaver, **E.S. Bellis**, C. Iwaki, J. Qualls, J. Randolph, & J. Smith. (Accepted). Massard Prairie Restoration and Soil Microbiome Succession. *Journal of the Arkansas Academy of Science.*

6. 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.

7. 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.

8. **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.

9. 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.

10. **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.

11. **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.*

12. **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.

13. 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.

14. 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

15. 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.
16. **E.S. Bellis*** , C.M. McLaughlin*, C.W. dePamphilis, & J.R. Lasky. The geography of parasite local adaptation to host communities. *In review*. doi: https://10.22541/au.159985357.77273677. *co-first authors.
17. 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) 2019

Coral Reef Alliance Coral Adaptation Challenge Grant ($18,000; role: PI) 2016

Regional

Arkansas INBRE Collaborative Research Grant: "Effect of Soil Microbiome Succession on the Prevalence of Antibiotic Resistance" ($51,446; role: PI) 2020

Arkansas INBRE Core Facility Voucher Award ($5,000; role: PI) 2020

Submitted/Pending

NSF EPSCoR RII Track-2: Artificial Intelligence for Plant Systems Science through EPSCoR AI-Campus (submitted; role: co-PI) 2021

NIH R35: Understanding the genotype-phenotype-environment nexus with ensemble learning ($1,378,720; submitted; role: PI) 2020

NSF EPSCoR RII Track-2: Connecting Artificial Intelligence and Plant Biology to Understand Adaptation to Environment ($4,683,896; not funded; role: co-PI) 2020

FELLOWSHIPS & AWARDS

National

Ecological Society of America NEON Early Career Scholar ($1,500) 2020

NSF Postdoctoral Research Fellowship in Biology ($207,000) 2017

Society for Integrative & Comparative Biology Libbie H. Hyman Memorial Scholarship ($1,500; declined) 2013

NSF Graduate Research Fellowship ($121,000) 2011

National Merit Scholarship ($2,500) 2006

Institutional

Oregon State University Paul & Mary Roberts Fellowship for the Study of Evolution ($2,500) 2017

University of Washington Summer Institute Scholarship ($900) 2016

Smithsonian Tropical Research Institute Short Term Fellowship ($3,000) 2014

Oregon State University Provost's Distinguished Fellowship ($30,000) 2011

Texas A&M University President's Endowed Scholarship, National Merit Recognition Award, Director's Excellence Award, and Non-Resident Tuition Waiver ($75,000) 2006

INVITED TALKS

Penn State Center for Parasitic & Carnivorous Plants, remote, Aug. 20 2020
University of Memphis Earth Sciences Colloquium Series, Memphis, TN, April 17 (*cancelled due to COVID-19*) 2020
University of Arkansas Fort Smith STEM Seminar, Fort Smith, AR, Feb. 14 2020
The Pennsylvania State University Ecology Seminar, State College, PA , Sep. 13 2019
NSF Plant Genome Research Program Awardee Meeting, Washington D.C., Sep. 4 2019
Society of Herbarium Curators Annual Meeting, Tucson, AZ, Aug. 1 2019
University of Arkansas for Medical Sciences Career Day, Little Rock, AR, Oct. 18 2019
Workshop on Genomics Tools for *Striga* management, Nairobi, Kenya, June 22 2018
Reed College Biology Department Seminar Series, Oct. 27 2017
Coral Reef Alliance Adaptation Challenge Workshop, San Francisco, CA, April 17 2017

COURSES TAUGHT

Arkansas State University

CS1114: Concepts of Programming (including Honors section) Spring 2021
CS6823: Special Topics: Introduction to Statistical Learning (cross-listed w/ MBS6251) Summer 2020

Oregon State University

Z362: Invertebrate Biology Lab (Instructor) Spring 2017
MCB525: Techniques in Molecular and Cellular Biology (Instructor) Fall 2016
BI213: Principles of Biology (Curriculum Development Assistant) Winter 2016
BI311: Genetics (Teaching Assistant) Spring 2014
BI212: Principles of Biology Lab (Teaching Assistant) Winter 2014
BI211: Principles of Biology Lab (Teaching Assistant) Fall 2013

STUDENT MENTORING

Arkansas State University

A. Le'Flore, Undergraduate Researcher	Oct. 2020–Present
A. Kronberger, Undergraduate Researcher (co-advised w/X. Huang)	Oct. 2020–Present
E. Soriano Chavez, Undergraduate Researcher	May 2020–Present
S. Rutledge, Undergraduate Researcher	Jan.–Aug. 2020

The Pennsylvania State University

T. Xia, Undergraduate Researcher (now pursuing Ph.D. at UC Davis)	2019
C. Yim, Undergraduate Researcher	2018–2019

Oregon State University

E. Kramer, Undergraduate Researcher	2016–2017
R. Edlund, Undergraduate Researcher	2014–2016
A. Vercruyssen, Undergraduate Researcher	2013–2014
B. VerWey, Undergraduate Researcher	2013
J. Seng, Undergraduate Researcher	2011–2014

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), and *Molecular Ecology Resources* (2020)

Guest Editor for *Molecular Ecology Resources* special issue (2020)

Regional

Team coach for Arkansas AI-Campus 2020, a hands-on training program to provide skills in machine learning to students and professionals in AR

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 (2020 – Present)

Service on Advisory Committee for four Ph.D. students in the Molecular Biosciences program (J. Stubblefield, 2019 – Present; J. Fowler, 2020 – Present; L. Martin, 2020 – Present; and B. Hale, 2020 – Present)

Service on Advisory Committee for one M.S. student in the Computer Sciences program (S. Singh, 2021 – Present)