

Carolyn Lawrence-Dill

IOWA STATE UNIVERSITY

College of Agriculture and Life Sciences

- Associate Dean for Research & Discovery
- Associate Director, Iowa Agriculture & Home Economics Experiment Station

EXPERIENCE

Iowa State University Associate Dean Associate Director	College of Agriculture & Life Sciences 2021 - present
Iowa State University Professor Associate Professor	Agronomy and Genetics, Development, & Cell Biology 2019 - present 2014 - 2019
USDA-ARS GS-14 GS-13 GS-12	Research Geneticist 2012 - 2013 2008 - 2012 2005 - 2008
Iowa State University Postdoctoral Associate	2003 - 2005
University of Georgia Research Assistant & NSF Fellow	1997 - 2003
Texas Tech University Research Assistant NSF/HHMI REU Fellow	1996 - 1997 1994, 1995 (summers)

PROFESSIONAL DEVELOPMENT

Iowa State University New Academic Leadership Bootcamp Research Collaboration Catalyst Iowa State I-Corps Food Systems Leadership Institute	ISU – Provost ISU – VPR ISU – Econ Dev & VPR APLU
USDA-ARS Congressional Briefing Assistant Area Director (detail) Science Leadership Development Resiliency Advantage Engaging & Encouraging Employees	Georgetown University ARS Midwest Area ARS Midwest Area US OPM US OPM



CONTACT

triffid@iastate.edu
+1 515.294.2573

513 Farm House Lane
Iowa State University
Ames, IA. 50011

ABOUT ME

Experienced research administrator, plant biologist, and data scientist. Committed to innovation for solving society's hardest problems. Focused on team leadership (and followership) for research coordination.

EDUCATION

Ph.D. Botany
University of Georgia
1997-2003

M.S. Biology
Texas Tech University
1996-1997

B.A. Biology
Hendrix College
1992-1996

table of contents

[CLICK TO ADVANCE](#)

<i>Education</i>	3
<i>Professional Experience (overview; details follow)</i>	3
<i>Professional Development</i>	5
<i>Detail of Major Accomplishments at ISU</i>	6
Context	6
Established the Office of Research & Discovery in the College of Ag and Life Sciences	6
Led the creation and deployment of CALS Strategic Plan(ning)	7
Established a Big Data community at Iowa State	7
Unified the Digital Agriculture community	7
Founded the North American Plant Phenotyping Network	8
Revamped bioinformatics at ISU	8
Set up training in predictive plant phenomics	8
Advanced Diversity, Equity, and Inclusion	8
<i>Detail of Major Accomplishments at USDA-ARS</i>	8
Context	8
Reinvented and integrated the Maize Genetics and Genomics Database	9
Promoted Organizational Change For Data Driven Discoveries	9
Created a Diverse, Equitable, and Inclusive environment	9
<i>Publications</i>	10
<i>Grants and Contracts</i>	15
<i>Professional Associations, Awards, and Recognition</i>	17
<i>Invited Seminars (last 5 years)</i>	18
<i>Teaching Experience</i>	19
Iowa State University (Instructor)	19
University of Georgia (Teaching Assistant)	20
Texas Tech University (Teaching Assistant)	20
<i>Mentorship</i>	20
<i>Outreach</i>	22
<i>Service to the Institution</i>	23
<i>Service to the Profession</i>	24

EDUCATION

Ph.D. Botany	2003	University of Georgia	Athens, Georgia
M.S. Biology	1997	Texas Tech University	Lubbock, Texas
B.A. Biology	1996	Hendrix College	Conway, Arkansas

PROFESSIONAL EXPERIENCE (OVERVIEW; DETAILS FOLLOW)

IOWA STATE UNIVERSITY

2021 - present	Associate Director, Iowa Agriculture and Home Economics Experiment Station (AES) College of Agriculture & Life Sciences (CALs)
----------------	---

- Established and launched the Office of Research and Discovery for CALS.
- Cultivated a culture of transparency and data-driven decision-making among faculty researchers.
- Encouraged and facilitated collaborative Team Science initiatives.
- Restructured AES program management to promote teamwork, transparency, and data-driven approaches.
- Spearheaded the development and implementation of the CALS Strategic Plan for 2022-2031.

2017 - 2019	Chair and Director of Graduate Education	Graduate Interdepartmental Bioinformatics & Computational Biology
-------------	---	--

- Implemented reformulated leadership by re-instituting turnover in the program's supervisory committee.
- Directed the reconstituted supervisory committee to review and update the program's 20-year-old governance document.
- Provided on-the-ground oversight during the transition to the first new Program Coordinator in over 15 years and expanded the position to cover three interdepartmental graduate programs.

2015 - 2021	Faculty Scholar	Plant Sciences Institute
-------------	-----------------	--------------------------

- Co-founded the Predictive Plant Phenomics graduate specialization across six graduate programs with support from a \$3M NSF NRT grant, catalyzing interdisciplinary training in this emerging field.
- Demonstrated leadership as Chair of the Executive Board of the North American Plant Phenotyping Network (NAPPN) by founding a 501(c)3 not-for-profit organization, providing a sound legal structure for the network's operations and growth.

2019 - present	Professor	Department of Agronomy and
2014 - 2019	Associate Professor	Department of Genetics, Development & Cell Biology

- Presidential Initiative "Big Data" targeted hire. Appointed as an Associate Professor (with tenure).
- Developed a vibrant community of data science researchers at ISU by organizing various seminar series, conferences, and symposia.
- Recognized as an advocate for change by the College of Agriculture and Life Sciences, the Office of the Vice President for Research, and the Office of the Provost, for reshaping the documentation and recognition of data science achievements for promotion and tenure.
- Filled positions for key administrative personnel.
- Produced an average of 4.83 peer-reviewed publications per year (2 to 9 publications annually).
- Secured over \$31M in funding over 7 years as either the Principal Investigator or Co-Principal Investigator.
- Awarded the YWCA Women of Achievement award, for outstanding research, personnel management, and community building, specifically for contributions towards eliminating racism and empowering women.

USDA-ARS

2008 - 2012 GS-14 Research Geneticist
2005 - 2008 GS-13 Research Geneticist
2003 - 2005 GS-12 Research Geneticist
2005 - 2013 Assistant Professor
Collaborator Iowa State Univ.

Corn Insects & Crop Genetics Research Unit

- Agency's first Category-I (research) scientist in bioinformatics and computational biology.
- Oversaw an annual federal budget of approximately \$500K for the project and managed a team of PhD-level biologists and computer scientists.
- Collaborated with ARS scientists to assess research computing within the agency, resulting in a whitepaper on future directions, the establishment of a new Chief Scientific Information Officer for the agency, and updated guidelines to facilitate data use, transfer, storage, and access.
- Implemented a recruitment strategy to place PhD-level curatorial expertise in regions with high representation of scientist stakeholders.
- Published an average of 1-4 peer-reviewed publications annually (mean = 2.40).
- Secured \$8,312,599 in funding over 9 years as PI, co-PI, or contractor.
- Earned the Midwest Area Equal Opportunity Award for outstanding team focused on plant germplasm and genomics outreach to American Indian communities.

IOWA STATE UNIVERSITY

2003 - 2005 Postdoctoral
Research Associate

Volker Brendel, Advisor

- Provided leadership and facilitated cross-institutional communication for the successful transition of a long-term USDA-ARS project to a new congressional district, ensuring smooth administration, oversight, and personnel transfer.
- Led the transition of the Maize Genetics Database from a non-sequence-based paradigm to a sequence-based paradigm, resulting in the development of a new Maize Genetics and Genomics Database (MaizeGDB) resource.

UNIVERSITY OF GEORGIA

1997 - 2003 Research Fellow
NSF Training Grant

R. Kelly Dawe and Russell L. Malmberg, Advisors

- Dissertation: "A combined bioinformatic/molecular-based approach to understanding molecular motors in plants"
- Conducted groundbreaking research on the cytoskeletal elements of flowering plants and discovered that they lack dynein, a major minus-end directed motor, which is unique among multicellular organisms. This finding was published as the first paper on the subject.
- Revolutionized the understanding of the relationship among kinesin motor protein superfamily members and demonstrated that plants have an expanded repertoire of minus-end directed kinesins.
- Organized researchers worldwide to function as a community and led the creation of a standardized kinesin nomenclature. This effort was recognized and reviewed on *The Taproot* podcast.

TEXAS TECH UNIVERSITY

1996 - 1997 Graduate Research
Assistant

A. Scott Holaday, Advisor

- Thesis: "Effects of mild night chilling on respiration of expanding cotton leaves"
- Published one peer-reviewed paper with the same title as the dissertation. This work continues to accumulate citations even today with findings serving as the basis for ongoing research.

1994 & 1995
summers

Fellow, NSF
REU/HHMI

A. Scott Holaday, Advisor

- Selected to serve as an 8-week summer intern both summers.
- Developed an independent research project that served as the basis for the M.S.

PROFESSIONAL DEVELOPMENT

ISU NEW ACADEMIC LEADERSHIP BOOTCAMP

2021 - 2022

Learning the ropes for work in administration

- Organized by the Office of the Provost.
- Monthly meetings focused on learning policies and practices for administration at Iowa State University. Involved guest speakers from central administrative offices.

ISU RESEARCH COLLABORATION CATALYST TRAINING

2020 - 2021

Facilitating interdisciplinary team science

- Organized by the Office of the Vice President for Research.
- Monthly meetings to focus on the support of team science through self-evaluation reading, homework assignments, and seminars by renowned leaders on collaborative research.

ISU I-CORPS PROGRAM

2019

Exploring the commercial potential for research outcomes

- Organized by the ISU Office of Economic Development and Industry Relations and the VP for Research.
- Weekly meetings over a two-month period.
- Developed a business model for a data sciences-oriented startup company by progressively considering alternate perspectives, input, and strategies.

FOOD SYSTEMS LEADERSHIP INSTITUTE, COHORT 13 FELLOW

2017 - 2019

Developing core leadership competencies for the
Association of Public and Land-Grant Universities

- Organized by the Association of Public and Land-Grant Universities.
- Components:
 - Three intensive training sessions on-site at diverse member universities (i.e., the North Carolina State University, The Ohio State University, and the University of California – San Luis Obispo).
 - Change project: ISU Bioinformatics and Computational Biology Program Revamp.
 - Professional coaching and formal mentorship (mentors: Iowa Senator Chuck Grassley and former ISU Department of Food Science Chair Dr. Ruth MacDonald).

CONGRESSIONAL BRIEFING CONFERENCE

2013

Understanding congressional process and procedure as well as
the “culture” that is the United States Congress

- Organized by Georgetown University Government Affairs Institute at the US Capital.
- Week-long training session focused on how authorization and appropriation work, how congressional committees function, and what congressional oversight is. Interactions with members of the Congressional Research Service and other agencies were facilitated.
- Seminars from constitutional historians, senators, staffers, and lobbyists.
- Visited key state and federal offices.

DETAIL: ACTING ASSISTANT AREA DIRECTOR, MWA USDA-ARS

2013

Experiential leadership training as a short-term member
of the Midwest Area Office

- Organized by the MWA Science Leadership Development Program.
- Three-week, on-site experience at the Midwest Area Office in Peoria, Illinois.
- Reviewed and provided feedback for Project Plan development.
- Provided feedback for scientist applications for the Research Position Evaluation System (i.e., promotion portfolios).
- Participated in meetings with research leaders across the Midwest Area.

RESILIENCY ADVANTAGE, US OPM

2012

Behavioral training to increase resilience in the
face of leadership challenges

One-week course conducted in Shepherdstown, West Virginia. Focused on how best to remain calm, cool, and collected in the face of organizational change and personnel issues.

ENGAGING & ENCOURAGING EMPLOYEES, US OFFICE OF PERSONNEL MANAGEMENT (OPM)

2012

Engaging employees to maximize individual performance,
team productivity, and organizational results

One-week course conducted in Aurora, Colorado. Focused on supporting employees and colleagues to become high-performing contributors and helping them to maintain a high level of performance.

DETAIL OF MAJOR ACCOMPLISHMENTS AT ISU**Context**

Iowa State University is Research I, public Land Grant institution founded in 1858 that currently enrolls ~30,000 students (roughly 84% undergraduate, 46% female). ISU is the largest university in the state of Iowa. In FY23, Iowa State brought in \$301.3 in external research funding and the College of Agriculture and Life Sciences reached \$61.4M in external research funding.

At ISU, I have focused on enabling and catalyzing research in agricultural sciences generally and data science specifically, fostering educational advancement through the development of data-focused programs and courses for the biosciences in general and for plant phenomics, and creating a diverse, equitable, and inclusive environment for team science in research.

Established the Office of Research & Discovery in the College of Ag and Life Sciences: This involved securing space and budget, reallocating existing research resources, and determining key collaborators. Cultivated a data-driven, transparent culture by reengaging with faculty researchers. Implemented the following initiatives:

- Launched CAPERs, the CALS Advisory Panel for Engaged Research, for faculty to address research challenges and meet with support offices.
- Restructured Center Director meetings for focused discussions on center support and management.
- Established a CALS webpage for researchers to access funding for travel, grant writing, and conferences.

To create an emphasis on Team Science I focused on:

- Strengthening collaboration between CALS administration and University research offices.
- Facilitating cross-college teamwork by revising financial support traditions.
- Promoting open engagement practices over competitive ones.

As Associate Dean for Research and Discovery and Associate Director for the Iowa Agriculture and Home Economics Experiment Station (AES), transformed AES program management for broader support, transparency, and engagement. Achievements include:

- Shifting project management to the CALS CARES pre-award team with a new data analyst.
- Facilitating the use of AES funds for Hatch Multistate Travel.
- Introducing incentives for engagement in capacity projects.
- Establishing a transparent equipment and infrastructure seed grant program in collaboration with Dr. R. MacDonald, Associate Dean for Personnel and Finance.
- Created ATLaS, an equipment finder for the University (Data Analyst Darwin Campbell's work).
- Service on the National Plant Germplasm Coordinating Committee, the North Central Regional Aquaculture Center Board of Directors, the North Central Regional Multistate Review Committee, The North Central Regional Nominating Committee, and the National Research Support Project (NRSP) Review Committee.
- Administrative Advisor for NC7, Conservation, Management, Enhancement and Utilization of Plant Genetic Resources; NC140, Improving Economic and Environmental Sustainability in Tree-Fruit Production through Changes in Rootstock Use; NC1203, Lipids in Plants: Improving and Developing Sustainability of Crops; NC1212, Exploring the Plant Phenome in Controlled and Field Environments

Led the creation and deployment of CALS Strategic Plan(ning): This plan spans 2022-2031.

- Assembled inputs, guided the writing team, and appointed Shawn Dorius as a Faculty Fellow in the Office of Research and Discovery to lead deployment.
- Generated a flexible plan that includes a purpose, strategic priorities, and mechanisms for aligning both existing and new efforts.
- Created a framework for the college to get involved ensuring the plan was compatible with the University strategy, ensuring that all CALS activities were represented, and responding to feedback from a diversity of stakeholders.

Established a Big Data community at Iowa State: Hired in 2014 with a focus on Big Data, I mobilized existing researchers in data sciences. Created a list serve with ~230 subscribers and initiated a successful monthly seminar series for four years, drawing around thirty participants each time. Organized a well-received "Data-Driven Science Initiative Workshop" in Spring 2015, attended by ~80 individuals, featuring speakers from various institutions. Contributed to the development of a new major, minor, and certificate in Data Sciences within the Computer Science department. Served on the Data Sciences Curriculum Committee for five years. Led the faculty subcommittee of the Data Sciences Task Force, tasked by the Vice President for Research with designing data sharing policies. Focused on refining guidelines for proposal data management plans and advocated for recognizing data sciences contributions in promotion and tenure evaluations.

Unified the Digital Agriculture community: In 2015, I led a successful interdisciplinary research initiative, "D3AI: Data-Driven Discovery for Agricultural Innovation," funded through a joint proposal with researchers from Agronomy and Mechanical Engineering. Over three years, the project garnered \$44M in funding and produced 46 research papers. This endeavor naturally connected with the Midwest Big Data Hub's Digital Agriculture community, which I actively engaged with, leading various activities such as:

- Coordinating the 2017 Midwest Big Data Summer School Digital Agriculture Track.
- Organizing the 2017 Plant Phenomics Phridays Summer Seminar Series in collaboration with Pat Schnable.
- Spearheading the Midwest Big Data Hub Digital Ag Spoke.
- Arranging the 2018 Metagenomics Mondays Summer Seminar Series with support from Gwyn Beattie and Iddo Friedberg.
- Coordinating a joint EU/US Big Data Mini-series focused on Satellites for Agriculture and Data Science for Plant Genomics and Phenomics.
- Hosting an International Controlled Environment Phenotyping "Women in Science" event at Iowa State.
- Co-leading the Midwest Big Data Hub's Digital Agriculture community for the current funding period, with a focus on facilitating small grants alongside PI J. Reecy and co-PI Joe Colletti.

- Leading teambuilding aspects of grant writing and coordination for the [Agricultural Genome to Phenome Initiative](#), AG2PI, which is a NIFA-funded organization that seeks to engage broad and diverse researchers by sponsoring and coordinating field days, conferences, training workshops, and seed grants.

Founded the North American Plant Phenotyping Network (NAPPN): In 2016, I received an NSF conference grant to coordinate the plant phenotyping community in the US and Europe. I organized conferences at the Plant and Animal Genome Conference and in Ames, resulting in guidance for funding agencies. A subset of seven engaged participants formed the ad hoc NAPPN board. We developed provisional bylaws, grew a membership of over 400 scientists, and held elections in early 2018. Elected as one of seven leaders, I focused on sustainability, proposing the creation of a not-for-profit organization. This proposal was approved, officially establishing NAPPN. Since my tenure, membership has surged to over 800, a successful conference was held, and funds were secured.

Revamped bioinformatics at ISU: My research is primarily concerned with plant bioinformatics and computational biology, making leadership in the undergraduate BCBio and Graduate BCB majors a natural fit. I have served on the supervisory committees of both and served as the Chair and Director of Graduate Education (DOGE) for BCB. Whereas BCBio is a very small program (with around fifteen undergrads participating most years), the graduate BCB program has approximately fifty PhD students any given year, with participating faculty from 4 academic colleges and 18 departments. For undergraduate bioinformatics, in 2015 I developed and taught two new classes, BCBio 322 – Introduction to Bioinformatics and BCBio 110 – Bioinformatics Orientation. Both are required courses for the BCBio undergraduate major that had never been taught before. As the Chair and DOGE of the BCB graduate program (2017-2019), I organized the BCB 690 Student Seminar and the BCB 691 Faculty Seminar. Restructured administration for the BCB program, focusing on supervisory committee membership and updating the program's governance document, which had remained unchanged for two decades. Despite pandemic-related recruitment challenges in 2020, the program remains successful, and efforts are underway to address recruitment for the upcoming season.

Set up training in predictive plant phenomics: In 2015, ISU professors Julie Dickerson, Ted Heindel, Pat Schnable, and I brought in a \$3M NSF Research Traineeship grant to establish the Predictive Plant Phenomics (P3) Specialization, combining plant science, data science, and engineering training with essential soft skills. The program accommodates students from various backgrounds, each with their own strengths and areas for growth. In 2016, I co-developed and taught ME/GDCB 585 – Fundamentals of Predictive Plant Phenomics, the core P3 course. This annual course blends lectures, projects, and lab work, with strong enrollment and an exciting development: former students contributed as guest instructors, enhancing cohort camaraderie and communication skills, while fostering program integration. This course is now available via the International Plant Phenotyping Network website so anyone anywhere can benefit from its content.

Advanced Diversity, Equity, and Inclusion: At the intersection of plant genomics and data science, I emphasize diversity, teamwork, and adaptability. This approach has gained recognition at ISU. My team management and documentation methods have been praised by various university departments and offices, serving as exemplars for team science achievements in promotion and tenure. I'm honored to have received the YWCA Women of Achievement award for contributions to research, personnel management, and community building. Recently, I led a team tasked with developing guiding principles for the Department of Agronomy's Diversity, Equity, and Inclusion (DEI) committee, ensuring turnover and broad participation, and defining the mission, vision, and values of DEI efforts. Additionally, I established a [Faculty Allies](#) page at ISU, providing a resource for individuals seeking support or advice based on student nominations.

DETAIL OF MAJOR ACCOMPLISHMENTS AT USDA-ARS

Context

One of four agencies in USDA's Research, Education and Economics mission area, the Agricultural Research Service (ARS) is the in-house research arm of the USDA. With over 7,000 employees, scientists working at USDA-ARS seek to extend scientific knowledge and solve the nation's agricultural problems through its four national

program areas: nutrition, food safety, and quality; animal production and protection; natural resources and sustainable agricultural systems; and crop production and protection. The ARS Headquarters is in Washington, D.C. and headquarters personnel are located at the George Washington Carver Center (GWCC) in Beltsville, Maryland. The ARS budget is approximately \$1.2 billion. Ames, Iowa is the largest location in terms of personnel for USDA-ARS outside of Beltsville.

At ARS my work as the Director of MaizeGDB, the maize model organism database, involved reinventing the project in the age of genome sequences, extending lessons learned to advance the agency's perspective on data science, and involving and supporting people to carry out that work through service focused on advancing inclusion, diversity, and civil rights activities.

Reinvented and integrated the Maize Genetics and Genomics Database: Leading the Maize Genetics and Genomics Database posed complex challenges. Under Volker Brendel's mentorship as a postdoc, I led a team that merged two independent biological databases into a unified resource, modernizing maize genetics. ZmDB focused on mutants and seed stocks indexed by mutator insertion sites, while MaizeDB emphasized genetics. With a programmer and database administrator, we overcame technical hurdles. USDA-ARS in Ames hired our team to continue the project, appointing me as a Category-I (Research) Geneticist. Initially, being a data scientist didn't align with expectations for independent research. However, Les Lewis, the unit's Research Leader, supported my role's evolution into a fully-fledged research appointment. I navigated federal regulations while pushing for constant renewal despite a preference for stability over cutting-edge methods. To engage the maize genetics community as active stakeholders, I formed a guidance committee with experts from the National Academy of Sciences, NIH data scientists, and leaders of model species databases. They provided annual input, propelling MaizeGDB forward in an environment where change can be slow.

Promoted Organizational Change For Data Driven Discoveries: In 2005, I spearheaded the relocation of Congressionally mandated funding from Missouri to Iowa to support the maize genetics database's transition. This shift enabled a new leadership and direction in Ames, Iowa. I implemented a hiring strategy, placing PhD-level curation expertise in regions well-represented by scientist stakeholders. This ensured improved service to project stakeholders. This transition led ARS researchers nationwide to seek advice on enabling easy access to "big data" resources for their research areas. In 2012, I collaborated with three colleagues to assess research computing in ARS, resulting in pivotal guidance and the appointment of a Chief Scientific Information Officer (CSIO). This initiative also updated guidelines on data use, transfer, storage, and access. In late 2013, I chose to decline the opportunity to become the agency's first full-time CSIO, instead joining Iowa State University as a tenured faculty member.

Created a Diverse, Equitable, and Inclusive environment: In 2006, I joined the Ames Area Civil Rights Advisory Committee, focusing on organizing diverse events and promoting awareness of diversity's benefits in projects and organizations. I later chaired both this committee and the ARS Midwest Area Outreach, Diversity, and Equal Opportunity Advisory Committee. Recognizing an opportunity to engage American Indian students in my research, I secured supplemental funding from NSF with guidance from Dr. Lemanuel Bitsoi. This initiative brought Navajo students to Ames for research internships, with ongoing participation for five years. Our team received the Midwest Area Equal Opportunity Award in 2009 for this outreach.

In 2007, my son Elliot was born. As a scientist trying to balance motherhood with work, I became keenly aware of the need for lactation rooms for working moms. I assessed lactation room availability in all ARS units in Ames and coordinated the allocation of appropriate spaces. Additionally, I served on the Board of Directors for a local federal daycare center, gaining valuable experience in managing not-for-profit organizations, which became important for my work in supporting scientific communities.

PUBLICATIONS

Asterisks (*) as corresponding author

Daggers (†) invited publications

Italics indicate those led, supervised, or mentored

Peer Reviewed Journal Articles

IN PREPARATION

Yanarella, C.F., Fattel, L.,* and **Lawrence-Dill, C.J. GWAS From Spoken Phenotypic Descriptions: A Proof of Concept From Maize Field Studies.

SUBMITTED

Yanarella, C.F., Fattel, L., Kristmundsdóttir, Á.Ý., Lopez, M.D., Edwards, J.W., Campbell, D.A., Abel, C.A.,* and **Lawrence-Dill, C.J. Wisconsin Diversity panel phenotypes: spoken descriptions of plants and supporting data. Submitted to BMC Research Notes.

Fattel, L. Yanarella, C.F., Ngara, B., Johnson, O.T., Campbell, D.A. Wimalanathan, K.,* and **Lawrence-Dill, C.J. Gene Function Annotations for the Maize NAM Founder Lines. Submitted to BMC Research Notes.

Braun, I.R. Yanarella, C.F., Durairaj Rajeswari J.P.,* Bassham, D.C., and **Lawrence-Dill, C.J. The Case for Retaining Natural Language Descriptions of Phenotypes in Plant Databases and a Web Application as Proof of Concept. Submitted to Database. Current version available via BioRxiv preprint doi: 10.1101/2021.02.04.429796. (accepted pending revisions)

IN PRESS

PUBLISHED

68. Interdisciplinary Plant Science Consortium. Inclusive collaboration across plant physiology and genomics: Now is the time! *Plant Direct*. 2023. 7(5):e43.
67. Tuggle, C.K, Clarke, J.; Dekkers, J.C.M.; Ertl, D., **Lawrence-Dill, C.J.**, Lyons, E., Murdoch, B.M., Scott, N.M.; Schnable, P.S. The Agricultural Genome to Phenome Initiative (AG2PI): creating a shared vision across crop and livestock research communities. *Genome Biology*, 2022. 23:1-11.
66. **Lawrence-Dill, C.J.**, Allscheid, R.L., Boaitay, A., Bauman, T., Buckler, E.S., Clarke, J.L., Cullis, C., Dekkers, J., Dorius, C.J., Dorius, S.F., Ertl, D., Homann, M., Hu, G., Losch, M., Lyons, E., Murdoch, B., Navabi, Z.-K., Punnuri, S., Rafiq, F., Reecy, J.M., Schnable, P.S., Scott, N.M., Sheehan, M., Sirault, X., Staton, M., Tuggle, C.K., Van Eenennaam, A., Voas, R. Ten Simple Rules to Ruin a Collaborative Environment. *PLoS Computational Biology*. 2022. 18 (4), doi: 10.1371/journal.pcbi.1009957.
65. **Fattel, L., Psaroudakis, D., Yanarella, C.F., Chiteri, K., Dostalík, H., Joshi, P., Starr, D.C. Vu, H., Wimalanathan, K.,* **Lawrence-Dill, C.J.** Standardized genome-wide function prediction enables comparative functional genomics: a new application area for Gene Ontologies in plants. *GigaScience*, vol. 11. doi: 10.1093/gigascience/giac023
64. Tuggle, C.K., Clarke, J., Dekkers, J., Ertl, D., **Lawrence-Dill, C.J.**, Lyons, E., Murdoch, B.M., Scott, N.M., Schnable, P.S. The Agricultural Genome to Phenome Initiative (AG2PI): creating a shared vision across crop and livestock research communities *Genome Biology*. 2022. 23 (1), 1-11. doi: 10.1186/s13059-021-02570-1.
63. **Wimalanathan, K.* and **Lawrence-Dill, C.J.** Gene Ontology Meta Annotator for Plants (GOMAP). *Plant Methods*. 2021. doi: 10.1186/s13007-021-00754-1.
62. Jarquín D., De Leon, N., Romay, M.C., Bohn, M.O., Buckler, E.S., Ciampitti, I.A., Edwards, J.W., Ertl, D., Flint-Garcia, S., Gore, M.A., Graham, C., Hirsch, C.N., Holland, J.B., Hooker, D.C., Kaeppler, S.M., Knoll, J. Lee, E.C., **Lawrence-Dill, C.J.**, Lynch, J.P., Moose, S.P., Murray, S.C., Nelson, R., Rocheford, T.R., Schnable, J.C., Schnable, P.S., Smith, M., Springer, N.M., Thomison, P., Tuinstra, M.R., Wisser, R.J., Xu, W., Yu, J., Lorenz, A.J. Utility of Climatic Information via Combining Ability Models to Improve Genomic Prediction for Yield within the Genomes to Fields Maize Project. *Frontiers in Genetics*. 2021 11, 1819. doi:10.3389/fgene.2020.592769.

61. †Pommier, C., Garnett, T., **Lawrence-Dill, C.J.**, Pridmore, T., Watt, M., Pieruschka, R., Ghamkhar, K. Phenotyping; From Plant, to Data, to Impact and Highlights of the International Plant Phenotyping Symposium-IPPS 2018. *Frontiers in Plant Science*. 2020. 11, 1907. doi:10.3389/fpls.2020.618342.
60. †* *Braun, I.R., Yanarella, C.F., and Lawrence-Dill, C.J.* Computing on Phenotypic Descriptions for Candidate Gene Discovery and Crop Improvement. *Plant Phenomics*. 2020. Article ID 1963251. doi:10.34133/2020/1963251
59. Manchanda, N., Portwood, J.L., Woodhouse, M.R., Seetharam, A.S., **Lawrence-Dill, C.J.**, Andorf, C.M., and Hufford, M.B. GenomeQC: A quality assessment tool for genome assemblies and gene structure annotations. *BMC Genomics*. 2020. 21 (1), 1-9. doi:10.1101/795237.
58. * *Braun I.R., Lawrence-Dill C.J.* Automated Methods Enable Direct Computation on Phenotypic Descriptions for Novel Candidate Gene Prediction. *Front Plant Sci*. 2020. Jan 10;10:1629. doi: 10.3389/fpls.2019.01629.
57. Falcon, C.M., Kaeppler, S.M., Spalding, E.P., Miller, N.D., AlKhalifah, N., Bohn, M., *Campbell, D.A.*, Buckler, E.S., Ciampitti, I., Edwards, J., Ertl, D., Flint-Garcia, S., Gore, M.A., Graham, C., Hirsch, C.N., Holland, J.B., Jarquín, D., Knoll, J., Lauter, N., Lee, E.C., **Lawrence-Dill, C.J.**, Lorenz, A., Lynch, J.P., Murray, S.C., Nelson, R., Rocheford, T., Schnable, P.S., Smith, M., Springer, N., Tuinstra, M., Walton, R., Wisser, R.J., Xu, W. and De Leon, N. Relative Utility of Agronomic, Phenological, and Morphological Traits to Assess Genotype by Environment Interaction in Maize Inbreds. *Crop Science*. 2019. doi: 10.1002/csc2.20035
56. Banakar R., Eggenberger A.L., Lee K., Wright D.A., Murugan K., *Zarecor S.*, **Lawrence-Dill C.J.**, Sashital D.G., Wang K. High-frequency random DNA insertions upon co-delivery of CRISPR-Cas9 ribonucleoprotein and selectable marker plasmid in rice. *Scientific Reports*. 2019. Dec 27;9(1):19902. doi: 10.1038/s41598-019-55681-y.
55. Bao, Y., *Zarecor, S.*, Shah, D., Tuel, T., *Campbell, D.A.*, Chapman, A.V.E., Imberti, D., Kiekhaefer, D., Imberti, H., Lübberstedt, T., Yin, Y., Nettleton, D., **Lawrence-Dill, C.J.**, Whitham, S.A., Tang, L., and Howell, S.H. Assessing plant performance in the Enviratron. *Plant Methods*. 2019. 15:117. doi:10.1186/s13007-019-0504-y.
54. Knauer, S., Javelle, M., Li, L., Li, X., Ma, X., *Wimalanathan, K.*, Kumari S., Johnston, R., Leiboff, S., Meeley, R., Schnable, P.S., Ware, D., **Lawrence-Dill, C.J.**, Yu, J., Muehlbauer, G.J., Scanlon, M.J., and Timmermans, M.C.P. A high-resolution gene expression atlas links dedicated meristem genes to key architectural traits. *Genome Research*. 2019. 29 (12), 1962-1973. doi:10.1101/gr.250878.119
53. Cho, K.T., Portwood, J.L., Gardiner, J.M., Harper, L.C., **Lawrence-Dill, C.J.**, Friedberg, I., and Andorf, C.M. MaizeDIG: Maize Database of Images and Genomes. *Frontiers in Plant Science*. 2019. 10:1050 doi:10.3389/fpls.2019.01050
52. *Lawrence-Dill, C.J., Schnable, P.S., and Springer, N.M. Idea Factory: The Maize Genomes to Fields Initiative *Crop Science* 59(4):1406-1410. 2019. doi:10.2135/cropsci2019.02.0071
51. * *He, M.*, Liu, P., and **Lawrence-Dill, C.J.** Compare expression profiles for pre-defined gene groups with C-REx. *Journal of Open Source Software* 4 (34), 1255. 2019. (reproducible manuscript.)
50. Agee Carroll, A., Clarke, J., Fahlgren, N., Gehan, M.A., **Lawrence-Dill, C.J.**, and Lorence, A. NAPPN: Who we are, where we are going, and why you should join us. *The Plant Phenome Journal*. 2019 2:180006 doi:10.2135/tppj2018.08.0006
49. Lee, K., Zhang, Y., Kleinstiver, B.P., Guo, J.A., Aryee, M.J., Miller, J., Malzahn, A., *Zarecor, S.*, **Lawrence-Dill, C.J.**, Joung, J.K., Qi, Y., and Wang, K. Activities and specificities of CRISPR-Cas9 and Cas12a nucleases for targeted mutagenesis in maize. *Plant Biotechnology Journal*. 2019 Feb;17(2):362-372.
48. Siegel, Z.D., Zhou, N., *Zarecor, S.*, Lee, N., *Campbell, D.A.*, Andorf, C.M., Nettleton, D., **Lawrence-Dill, C.J.**, Ganapathysubramanian, B., Friedberg, I., and Kelly, J.W. Crowdsourcing Image Analysis for Plant Phenomics to Generate Ground Truth Data for Machine Learning. *PLoS Computational Biology*. Jul 30;14(7):e1006337. 2018. doi: 10.1371/journal.pcbi.1006337. (preprint at doi: 10.1101/265918)
47. * *AlKhalifah, N., Campbell, D.A., Falcon, C.M., Gardiner, J.M., Miller, N.D., Romay, M.C., Walls, R., Walton, R., Yeh, C., Bohn, M., Bubert, J., Buckler, E.S., Ciampitti, I., Flint-Garcia, S., Gore, M.A., Graham, C., Hirsch, C., Holland, J.B., Hooker, D., Kaeppler, S., Knoll, J., Lauter, N., Lee, E.C., Lorenz, A., Lynch, J.P., Moose, S.P. Murray, S.C., Nelson, R., Rocheford, T., Rodriguez, O., Schnable, J.C., Scully, B., Smith, M., Springer, N., Thomison, P., Tuinstra, M., Wisser, R.J., Xu, W., Ertl, D., Schnable, P.S., De Leon, N., Spalding, E.P.,*

- Edwards, J., and **C.J. Lawrence-Dill**. Maize Genomes to Fields: 2014 and 2015 Field Season Genotype, Phenotype, Environment, and Inbred Ear Image Datasets. *BMC Research Notes*, 11: 452, 2018. doi: 10.1186/s13104-018-3508-1.
46. Srivastava, R., Li, Z., Russo, G., Tang, J., Bi, R., Muppirala, U., Chudalayandi, S., Severin, A., *He, M.*, Vaitkevicius, S., **Lawrence-Dill, C.J.**, Liu, P., Stapleton, A. Bassham, D., Brandizzi, F., and Howell, S. Response to persistent ER stress in plants: a multiphasic process that transitions cells from prosurvival activities to cell death. *The Plant Cell*. Jun;30(6):1220-1242. 2018. doi: 10.1105/tpc.18.00153.
45. ***Lawrence-Dill, C.J.**, Heindel, T.J., Schnable, P.S., Strong, S.J., Wittrock, J., Losch, M.E., and Dickerson, J.A. Transdisciplinary Graduate Training in Predictive Plant Phenomics. *Agronomy Special Issue on Precision Phenotyping in Plant Breeding*, 8(5):73. 2018. doi: 10.3390/agronomy8050073.
44. **Wimalanathan, K.*, Friedberg, I., Andorf, C.M., and **Lawrence-Dill, C.J.** Maize GO Annotation - Methods, Evaluation, and Review (maize-GAMER). *Plant Direct*, Apr; 2(4)e00052. doi: 10.1002/pld3.52. 2018. (preprint at doi: 10.1101/222836)
43. Dorius, S. and **Lawrence-Dill, C.J.** Sowing the seeds of skepticism: Russian state news and the anti-GMO movement. *GM Crops & Food*, Mar;21:0. doi: 10.1080/21645698.2018.1454192. 2018. (preprint at doi: 10.17605/osf.io/26ubf).
42. **He, M.*, Liu, P., **Lawrence-Dill, C.J.** A method to assess significance of differences in RNA expression levels among specific groups of genes. *Current Plant Biology*, Dec;11-12:46-51. 2017. (preprint at doi: 10.1101/136143)
41. Gage, J., Jarquin, D., Romay, C., Lorenz, A., Buckler, E.S., Kaeppler, S., *AlKhalifah, N.*, Bohn, M., *Campbell, D.*, Edwards, J., Ertl, D., Flint-Garcia, S., *Gardiner, J.*, Good, B., Hirsch, C.N., Holland, J., Hooker, D., Knoll, J., Kolkman, J., Kruger, G., Lauter, N., **Lawrence-Dill, C.J.**, Lee, E., Lynch, J., Murray, S., Nelson, R., Petzoldt, J., Rocheford, T., Schnable, J., Schnable, P., Scully, B., Smith, M., Springer, N., Srinivasan, S., *Walton, R.*, Weldekidan, T., Wisser, R., Xu, W., Yu, J., and De Leon, N. The effect of artificial selection on phenotypic plasticity: The genotype by environment interaction project in maize. *Nature Communications*. 8 (1), 1348. 2017.
40. †Pauli, D., Chapman, S.C., Bart, R., Topp, C.N., **Lawrence-Dill, C.J.**, Poland, J., and Gore, M.A. The Quest for Understanding Phenotypic Variation via Integrated Approaches in the Field Environment. *Plant Physiol*. Oct;172(2):622-634. 2016.
39. Wolt, J.D., Wang, K., Sashital, D., and **Lawrence-Dill, C.J.** Achieving Plant CRISPR Targeting that Limits Off-Target Effects. *Plant Genome*. 9(3). doi:10.3835/plantgenome2016.05.0047. 2016.
38. Andorf, C.M., Cannon, E.K., Portwood, J.L., *Gardiner, J.M.*, Harper, L.C., Schaeffer, M.L., Braun, B.L., *Campbell, D.A.*, Vinnakota, A.G., Sribalusu, V.V., Huerta, M., Cho, K.T., *Wimalanathan, K.*, Richter, J.D., *Mauch, E.D.*, Rao, B.S., Birkett, S.M., Sen, T.Z., and **Lawrence-Dill, C.J.** MaizeGDB update: new tools, data and interface for the maize model organism database. *Nucleic Acids Res*. Jan4;44(D1):D1195-201. DOI 10.1093/nar/gkv1007. 2016.
37. **Brazelton, V.A., Jr*, *Zarecor, S.*, Wright, D.A., Wang, Y., Liu, J., Chen, K., Yang, B., and **Lawrence-Dill, C.J.***. A Quick Guide to CRISPR sgRNA Design Tools. *GM Crops & Food*. 2015.
36. Thessen, A.E., Bunker, D.E., Buttigieg, P.L., Cooper, L.D., Dahdul, W.M., Domisch, S., Franz, N.M., Jaiswal, P., **Lawrence-Dill, C.J.**, Midford, P.E., Mungall, C.J., Ramírez, M.J., Specht, C.D., Vogt, L., Vos, R.A., Walls, R.L., White, J.W., Zhang, G., Deans, A.R., Huala, E., Lewis, S.E., and Mabee, P.M. Emerging semantics to link phenotype and environment. *PeerJ*. 2015 Dec14;3:e1470 DOI10.7717/peerj. 2015.
35. *Oellrich, A., Walls, R.L., Cannon, E.K.S., Cannon, S.B., Cooper, L. *Gardiner, J.*, Gkoutos, G.V., Harper, L., *He, M.* Hoehndorf, R., Jaiswal, P., Kalberer, S.R., Lloyd, J.P., Meinke, D., Menda, N., Moore, L. Nelson, R.T., Pujar, A., **Lawrence, C.J.**, and Huala, E. An ontology approach to comparative phenomics in plants. *Plant Methods*.11:10. DOI 10.1186/s13007-015-0053-y. 2015.
34. Law, M., Childs, K.L., Campbell, M.S., Stein, J.C., Olson, A.J., Holt, C., Panchy, N., Lei, J., Jiao, D., Andorf, C.M., **Lawrence, C.J.**, Ware, D., Shiu, S.H., Sun, Y., Jiang, N., and Yandell, M. Automated update, revision, and quality control of the maize genome annotations using MAKER-P improves the B73 RefGen_v3 gene models and identifies new genes. *Plant Physiol*. 167(1):25-39. 2015.

33. Deans, A.R., Lewis, S.E., Huala, E., Anzaldo, S.S., Ashburner, M., Balhoff, J.P., Blackburn, D.C., Blake, J.A., Burleigh, J.G., Chanet, B., Cooper, L.D., Courtot, M., Csösz, S., Cui, H., Dahdul, W., Das, S., Dececchi, T.A., Dettai, A., Diogo, R., Druzinsky, R.E., Dumontier, M., Franz, N.M., Friedrich, F., Gkoutos, G.V., Haendel, M., Harmon, L.J., Hayamizu, T.F., He, Y., Hines, H.M., Ibrahim, N., Jackson, L.M., Jaiswal, P., James-Zorn, C., Köhler, S., Lecointre, G., Lapp, H., **Lawrence, C.J.**, Le Novère, N., Lundberg, J.G., Macklin, J., Mast, A.R., Midford, P.E., Mikó, I., Mungall, C.J., Oellrich, A., Osumi-Sutherland, D., Parkinson, H., Ramírez, M.J., Richter, S., Robinson, P.N., Ruttenberg, A., Schulz, K.S., Segerdell, E., Seltmann, K.C., Sharkey, M.J., Smith, A.D., Smith, B., Specht, C.D., Squires, R.B., Thacker, R.W., Thessen, A., Fernandez-Triana, J., Vihinen, M., Vize, P.D., Vogt, L., Wall, C.E., Walls, R.L., Westerfeld, M., Wharton, R.A., Wirkner, C.S., Woolley, J.B., Yoder, M.J., Zorn, A.M., and Mabee, P. Finding our way through phenotypes. *PLoS Biol.* 13(1):e1002033. 2015.
32. *Andorf, C.M.*, Kopylov, M., Dobbs, D., Koch, K.E., Stroupe, E., **Lawrence, C.J.**, and Bass, H.W. G-quadruplexes as cis-acting control elements in genes associated with response to hypoxia, low sugar, and nutrient deprivation in maize (*Zea mays* ssp. *mays* L.). *Journal of Genetics and Genomics* 41(12):627-647. 2014.
31. Campbell, M.S., Law, M.Y., Holt, C., Stein, J.C., Gaurav, M., Hunagel, D.E., Lei, J., Achawanantakun, R., **Lawrence, C.J.**, Ware, D., Shiu, S.H., Childs, K., Sun, Y, Jiang, N., and Yandell, M. MAKER-P: a tool-kit for the rapid creation, management, and quality control of plant genome annotations. *Plant Phys.* 164(2):513-524. 2014.
30. Ghaffari, R., *Cannon, E.K.*, Kanizay, L.B., **Lawrence, C.J.**, Dawe, R.K. Maize chromosomal knobs are located in gene-dense areas and suppress local recombination. *Chromosoma.* Mar;122(1-2):67-75. doi: 10.1007/s00412-012-0391-8. 2013.
29. †Monaco, M.K., Sen, T.Z., Dharmawardhana, P.D., Ren, L., Schaeffer, M., Naithani, S., Amarasinghe, V., Thomason, J., *Harper, L., Gardiner, J., Cannon, E.K.S., Lawrence, C.J., Ware, D., and Jaiswal, P.* Maize Metabolic Network Construction and Transcriptome Analysis. *Plant Genome.* Mar 6(1):1-12. doi:10.3835/plantgenome2012925. 2013
28. †Robbins R.J., Amaral-Zettler L., Bik, H., Blum, S., Edwards, J., Field, D., Garrity, G., Gilbert, J.A., Kottmann, R., Krishtalka, L., Lapp, H., **Lawrence, C.**, Morrison, N., Tuama, E.Ó., Parr, C., San Gil, I., Schindel, D., Schriml, L., Vieglas, D., Wooley, J. RCN4GSC Workshop Report: Managing Data at the Interface of Biodiversity and (Meta)Genomics, March 2011. *Stand Genomic Sci.* 2012 Oct 10;7(1):159-65. doi: 10.4056/sigs.3156511. 2012.
27. *†**Lawrence, C.J.** MaizeGDB – past, present, and future. *Maydica* 56(1-2):3-6. 2011.
26. **Cannon, E.K., Birkett, S.M., Braun, B.L., Kodavali, S., Jennewein, D.M., Yilmaz, A., Antonescu, V., Antonescu, C., Harper, E.C., Gardiner, J.M., Schaeffer, M.L., Campbell, D.A., Andorf, C.M., Andorf, D., Lisch, D., Koch, K.K., McCarty, D.R., Quackenbush, J., Grotewold, E., Lushbough, C.M., Sen, T.Z., and Lawrence, C.J.* POPcorn: an online resource providing access to distributed and diverse maize project data. *International Journal of Plant Genomics.* doi: 10.1155/2011/923035. 2011.
25. Schaeffer, M.L., *Harper, L.C., Gardiner, J.M., Andorf, C.M., Campbell, D.A., Cannon, E.K.S., Sen, T.Z. and Lawrence, C.J.* MaizeGDB: curation and outreach go hand-in-hand. *Database: The Journal of Biological Databases and Curation.* doi: 10.1093/database/bar022. 2011.
24. *Harper, L.C., Schaeffer, M.L., Thistle, J., Gardiner, J.M., Andorf, C.M., Campbell, D.A., Cannon, E.K.S., Braun, B.L., Birkett, S.M., Lawrence, C.J., and Sen, T.Z.* The MaizeGDB Genome Browser tutorial: one example of database outreach to biologists via video. *Database: The Journal of Biological Databases and Curation.* doi: 10.1093/database/bar016. 2011.
23. Green, J.M., Harnsomburana, J., Schaeffer, M.L., **Lawrence, C.J.**, and Shyu, C.R. Multi-source and ontology-based retrieval engine for maize mutant phenotypes. *Database: the Journal of Biological Databases and Curation.* doi: 10.1093/database/bar012. 2011.
22. Sen, T.Z., *Harper, L.C., Schaeffer, M.L., Andorf, C.M., Seigfried, T.E., Campbell, D.A., and Lawrence, C.J.* Choosing a genome browser for a model organism database: surveying the maize community. *Database: the Journal of Biological Databases and Curation.* doi: 10.1093/database/baq007. 2010.

21. Lushbough, C., Bergman, M.K., **Lawrence, C.J.**, Jennewein, D., and Brendel, V. BioExtract Server – an integrated workflow-enabling system to access and analyze heterogenous, distributed biomolecular data. *IEEE/ACM Transactions on Computational Biology and Bioinformatics* 7(1):12-24. 2010.
20. Gray J., Bevan, M., Brutnell, T., Buell, C.R., Cone, K., Hake, S., Jackson, D., Kellogg, E., **Lawrence, C.**, McCouch, S., Mockler, T., Moose, S., Paterson, A., Peterson, T., Rokhsar, D., Souza, G.M., Springer, N., Stein, N., Timmermans, M., Wang, G.L., and Grotewold, E.A. Recommendation for naming transcription factor proteins in the grasses. *Plant Physiology* 149(1):4-6. 2009.
19. *Andorf, C.M., Lawrence, C.J., Harper, L.C., Schaeffer, M.L., Campbell, D.A., and Sen, T.Z.* The Locus Lookup tool at MaizeGDB: identification of genomic regions in maize by integrating sequence information with physical and genetic maps. *Bioinformatics* 26(3):434-436. 2009.
18. *Sen, T.Z., *Andorf, C.M., Schaeffer, M.L., Harper, L.C., Sparks, M.E., Duvick, J., Brendel, V.P., Cannon, E., Campbell, D.A., and Lawrence, C.J.* MaizeGDB becomes 'sequence-centric'. *Database: the Journal of Biological Databases and Curation*. doi: 10.1093/database/bap020. 2009.
17. Yi, G., Luth, D., *Goodman, T.D., Lawrence, C.J., and Becraft, P.W.* High-throughput linkage analysis of Mutator insertion sites in maize. *The Plant Journal* 58(5):883-892. 2009.
16. Lushbough, C.M., Bergman, M.K., **Lawrence, C.J.**, Jennewein, D., and Brendel, V. Implementing bioinformatic workflows with the BioExtract Server. *International Journal of Computational Biology and Drug Design* 1(3):302-312. 2008.
15. *†**Lawrence, C.J., Harper, L.C., Schaeffer, M.L., Sen, T.Z., Seigfried, T.E., and Campbell, D.A.** MaizeGDB: the maize model organism database for basic, translational, and applied research. *International Journal of Plant Genomics* 496957. 2008.
14. Duvick, J., Fu, A., Muppirala, U., Sabharwal, M., Wilkerson, M.D., **Lawrence, C.J.**, Lushbough, C., and Brendel, V. PlantGDB: a resource for comparative plant genomics. *Nucleic Acids Research* 36 (Database issue):D959-965. 2008.
13. ***Lawrence, C.J.** and Walbot, V. Reply: specific reasons to favor maize in the U.S. *Plant Cell* 19(10):2973. 2007.
12. ***Lawrence, C.J.** and Walbot, V. Maize as a model for bioenergy production from fuelstock grasses. *The Plant Cell* 19(7):2091-2094. 2007.
11. ***Lawrence, C.J., Schaeffer, M.L., Seigfried, T.E., Campbell, D.A., and Harper, L.C.** MaizeGDB's new data types, resources and activities. *Nucleic Acids Research* 35(Database issue):D895-900. 2007.
10. ***Lawrence, C.J., Seigfried, T.E., Bass, H.W., and Anderson, L.K.** Predicting chromosomal locations of genetically mapped loci in maize using the Morgan2McClintock Translator. *Genetics* 172(3):2007-2009. 2006.
9. †Dong, Q., **Lawrence, C.J., Schlueter, S.D., Wilkerson, M.D., Kurtz, S., Lushbough, C., and Brendel, V.** Comparative plant genomics resources at PlantGDB. *Plant Physiology* 139:610-618. 2005.
8. †**Lawrence, C.J., Seigfried, T.E., and Brendel, V.** The Maize Genetics and Genomics Database. The community resource for access to diverse maize data. *Plant Physiology* 138:55-58. 2005.
7. †Baran, S.B., **Lawrence, C.J., and Brendel, V.** Plant genome research outreach portal. A gateway to plant genome research "outreach" programs and activities. *Plant Physiology* 134(3):889. 2004.
6. ***Lawrence, C.J., Dawe, R.K., Christie, K.R., Cleveland, D.W., Dawson, S.C., Endow, S.A., Goldstein, L.S.B., Goodson, H.V., Hirokawa, N., Howard, J., Malmberg, R.L., McIntosh, J.R., Miki, H., Mitchison, T.J., Okada, Y., Reddy, A.S.N., Saxton, W.M., Schliwa, M., Scholey, J.M., Vale, R.D., and Walczak, C.E., and Wordeman, L.** A standardized kinesin nomenclature. *The Journal of Cell Biology* 167(1):19-22. 2004.
5. **Lawrence, C.J., Zmasek, C.M., Dawe, R.K., and Malmberg, R.L.** LumberJack: a heuristic tool for sequence alignment exploration and phylogenetic inference. *Bioinformatics* 20(12):1977-1979. 2004.
4. **Lawrence, C.J., Dong, Q., Polacco, M.L., Seigfried, T.E., and Brendel, V.** MaizeGDB: the community database for maize genetics and genomics. *Nucleic Acids Research* 32(Database issue):D393-397. 2004.
3. **Lawrence, C.J., Malmberg, R.L., Muszynski, M.G., and Dawe, R.K.** Maximum likelihood methods reveal conservation of function among closely related kinesin families. *Journal of Molecular Evolution* 54(1):42-53. 2002.
2. **Lawrence, C.J., Morris, N.R., Meagher, R.B., and Dawe, R.K.** Dyneins have run their course in plant lineage. *Traffic* 2(5):362-363. 2001.

1. **Lawrence, C.** and Holaday, A.S. Effects of mild night chilling on respiration of expanding cotton leaves. *Plant Science* 157(2):233-244. 2000.

See [Google Scholar](#) for >15 Additional Publications that are not necessarily peer reviewed.

Major Dataset Releases (over 50)

<https://datasetsearch.research.google.com/search?src=0&query=carolyn%20lawrence-dill&docid=L2cvMTFzdmxsa3YyaA%3D%3D>

GRANTS AND CONTRACTS

EXTRAMURAL

Role	Period of Performance	Funding Source	Title	Award Amount
PI	2020-2021	USDA-ARS	Coordination of AgBioData Consortium for Agricultural Genetics, Genomics and Breeding Databases	\$40,000
	2020-2021	Iowa Corn	Supporting the North American Plant Phenotyping Network	\$19,329
	2017-2018	Iowa Corn	Encouraging Broad Use of Genomes to Fields Data: Populating a FAIR Data Demonstrator	\$32,623
	2016-2018	National Corn Growers Association	Strengthening Information Systems That Support Maize Research	\$95,000
	2015-2017	NSF	Meeting: High-throughput Plant Phenotyping and Data Analysis, A Series of Workshops	\$48,033
	2015-2017	Iowa Corn	Information Management Solutions, Genomes to Fields	\$93,570
	2014-2015	Iowa Corn	Informatics Support for the Genotype x Environment Subgroup of the Maize G2F Initiative	\$13,400
	2014-2015	National Corn Growers Association	Database for Maize Phenotypic Data with Emphasis on Breeding Data	\$96,914
	2008-2011	NSF	POPcorn – A Project Portal for corn	\$485,696
Co-PI	2021-2026	USDA & NSF	AIIRA: AI Institute for Resilient Agriculture	\$20,000,000
	2021-2022	USDA NIFA	AG2PI Collaborative: Seeding the Future of Agricultural Genome to Phenome Research for Crops and Livestock	\$960,000
	2020-2023	NSF MRI	MRI: Acquisition of a Shared High-Performance Computing System for Cyber-Enabled System Design	\$600,000
	2020-2022	USDA NIFA	AG2PI Collaborative: Creating a Shared Vision Across Crop and Livestock Communities	\$960,000

2020-2022	USDA NIFA	Enabling Researchers to Compute on Phenotype: Machine Learning and Natural Language Processing for Novel Candidate Gene Prediction (Advisee Ian Braun as PI)	\$120,000
2019-2023	NSF	BD Hubs: Collaborative Proposal: Midwest: Midwest Big Data Hub: Building Communities to Harness the Data Revolution	\$200,000
2019-2023	USDA NIFA	High Intensity Phenotyping Sites: A Multi-Scale, Multi-Modal Sensing and Sense-Making Cyber-Ecosystem for Genomes to Fields	\$2,930,432
2017-2020	NSF BDH	BD Hubs: Collaborative Proposal: Midwest: Midwest Big Data Hub: Building Communities to Harness the Data Revolution	\$1,420,869
2017-2019	NSF MRI	MRI: Acquisition of a HPC System: Computing for Sustainability	\$678,000
2016-2020	USDA-NIFA BRAG	A Data-driven CRISPR Design Tool for Reduced Off-target Activity in Plant Genome Editing	\$465,000
2015-2021	NSF	NRT-DESE: P3 -- Predictive Phenomics of Plants	\$2,866,938
2015-2016	USDA-ARS	Development of Maize Sequence Annotation Methods and Pipelines for MaizeGDB	\$35,120
2014-2017	NSF	MRI: ENVIRATRON – an accelerator for climate change research	\$1,463,220
2013-2014	National Corn Growers Association	Functional Genomics Software Tools for MaizeGDB	\$90,682
2011-2013	National Corn Growers Association	Functional Genomics Software Tools for MaizeGDB	\$196,276
2011-2013	NSF	GEPR: Functional Structural Diversity Among Maize Haplotypes	\$3,000,000
2006-2011	NSF	Cyberinfrastructure for (Comparative) Plant Genome Research Through PlantGDB	\$4,120,931
Subcontractor			
2012-2017	NSF	Genetic Networks Regulating Structure and Function of the Shoot Apical Meristem	\$153,597
2011-2012	NSF	Genomic Analyses of Shoot Meristem Function in Maize	\$35,343
2011-2012	Monsanto	American Indian Outreach	\$7,000
2011-2012	ISU (Entomology)	American Indian Outreach	\$1,500
2011-2012	ISU (GDCB)	American Indian Outreach	\$3,500

2010-2011	NSF	BREAD: Improving Water Acquisition in Maize with Root Traits that Reduce the Metabolic Cost of Soil Exploration	\$49,765
2010-2011	USAID	Transfer QTL and other maize marker data into MaizeGDB	\$41,782
2009-2011	NSF	Construction of Comprehensive Sequence Indexed Transposon Resources for Maize	\$73,885
2009-2010	NSF	The Grass Regulome Initiative: Integrating Control of Gene Expression and Agronomic Traits Across the Grasses	\$26,206
2009	DOE	SNP Genotyping for the Mo17 Genome	\$23,472
2004-2007	NSF	PlantGDB – Plant Genome Database and Analysis Tools	\$93,646

INTRAMURAL

Role	Period of Performance	Funding Source	Title	Award Amount
PI	2015-2021	ISU Plant Sciences Institute Faculty Fellow	Developing and Deploying Standard Data Acquisition and Analysis Formats and Tools to Enable Predictive Phenomics	~\$700,000
	2015-2018	ISU PIRI	D3AI: Data-Driven Discovery for Agricultural Innovation	\$750,000
	2007	ISU Office of Biotechnology	Workshop on Translational Biology	\$4,620
coPI	2018-2020	ISU PIRS	Leveraging in silico Phenolog Identification to Advance Agricultural and Biomedical Research	\$41,698
	2017-2018	ISU Crop Bioengineering Center	Engaging Policymakers and the Public in Discussions around the Impacts of Genome Editing Technologies	\$12,500
Lead Scientist	2005-2013	USDA-ARS	MaizeGDB	~\$5,000,000

PROFESSIONAL ASSOCIATIONS, AWARDS, AND RECOGNITION

ASSOCIATE EDITOR

The Plant Phenome Journal 2017 – 2021

Frontiers in Bioinformatics and Computational Biology 2017 – 2021

MEMBER

AAAS American Association for the Advancement of Science

ASPB American Society of Plant Biologists

GSA Genetics Society of America

ISB International Society for Biocuration

NAPPN North American Plant Phenotyping Network

MGC Maize Genetics Cooperation

Past memberships include the International Society for Computational Biology, Society for Advancement of Chicanos/Hispanics and Native Americans in Science, the American Indian Science and Engineering Society.

FOUNDER

NAPPN: North American Plant Phenotyping Network

- Brought in \$48,033 in NSF Conference Funding to support initiation 2015.
- One of 7 initial *ad hoc* Board members.
- Elected Executive Board member 2018-2020; Chair 2019-2020.
- Founded a not-for-profit 501(c)3 for the organization in 2020.

HONORS, AWARDS, AND ELECTED SERVICE

2023	Maize Genetics Cooperator Award for supporting community resources, organizing collaborative efforts, or enabling maize research.
2021	Appointed member, Board of Directors. Foundation for Food and Agriculture Research (FFAR; 2-year term – reappointed in 2023 for a 5-year term)
2020	Received the YWCA Women of Achievement award for eliminating racism and empowering women.
2018	Elected to the International Plant Phenotyping Network Board (3-year term)
2018	Elected to the North American Plant Phenotyping Network Executive Board (3-year term; 2019-2020 chair)
2016	Elected to the International DivSeek Steering Committee (5-year term)
2013	Inducted into Gamma Sigma Delta, the Honor Society of Agriculture
2010	Elected to the Maize Genetics Executive Committee (5-year term; 2015 chair)
2009	Recognized by USDA-ARS by being selected to receive the Midwest Area Equal Opportunity Award for plant germplasm and genomics outreach to American Indians
2001	Elected Botany Graduate Student Association Secretary/Treasurer, University of Georgia

INVITED SEMINARS (LAST 5 YEARS)

2023

- Presented guest lecture entitled, "Team Science" for AGEDS 615 Graduate Seminar on Grant Writing.
- LGU2U invited speaker. Topic: Integration of Capacity and Competitive Funds for Supporting Programming and Research Activities

2022

- American Seed Trade Association. Presented an invited seminar and served on a panel to discuss AI and Machine Learning for the seed industry.

2021

- Invited speaker, Equity, Diversity, and Inclusion presentation entitled, "Context is Everything" NAPPN Annual Meeting, Athens, GA.
- Invited speaker, Boy Scouts of America Spirit of Adventure Council New England Base Camp all-girl troop. Presentation entitled, "We Create the Future".
- Student invited speaker, Fall 2021 CALS Ambassadors at Iowa State University, Ames, IA.
- Invited speaker, Fall 2021 seminar series for Crop Sciences and Plant Biology at the University of Illinois, Urbana, IL.
- Student invited speaker, WiDS: Women in Data Science, Iowa State University, Ames, IA.

2020

- Invited Keynote, Function COSI for ISMB, Intelligent Systems for Molecular Biology (virtual).
- Invited Speaker, P&T Best Practices - Faculty Experience. College of Agriculture and Life Sciences, Iowa State University, Ames, IA.
- Invited Speaker, Donald Danforth Plant Science Center, St. Louis, MO.
- Invited Speaker, Illinois Corn Breeders' School, University of Illinois, Urbana-Champaign, IL.
- Invited Speaker, Corteva Agrisciences, Johnston, IA (cancelled due to pandemic).
- Student invited Speaker, Interdepartmental Plant Biology Iowa State University, Ames, IA.

2019

- Student-Invited Speaker, Michigan State University Student-organized Plant Science Symposium.
- Invited panel organizer for the Iowa State University Graduate College Emerging Leadership Academy (GC-ELA) discussion on leading a research group.

2018

- Student-Invited Speaker, University of Wisconsin – Madison Plant Sciences Graduate Student Council.
- Invited Speaker, ICEppg (International Controlled Environment plant phenotyping group) Meeting to describe ENVIRATRON, Adelaide, Australia.
- Invited Panel Member for Data Analysis, International Plant Phenotyping Symposium, Adelaide, Australia.
- Conference organizer and invited speaker, Midwest Big Data Hub Digital Agriculture All Hands Meeting/UAS Workshop, University of Nebraska – Lincoln.
- Invited speaker (one of seven), International Conference on Biological Ontology. Eugene, OR.
- Invited Panel Member for Digital Agriculture: Prospects and Challenges in the Great Lakes Region, Great Lakes Economic Forum, Montreal, Canada.
- Student-Invited Alumnus Speaker, Department of Biology, Hendrix College, Conway, AR.
- Invited podcast for the American Society for Plant Biology's Plantae series describing why the field of phenomics is important. Available online at <http://bit.ly/2vfvx6r>.
- Invited to present "Maize GO Annotation Method, Analysis, and Review" for the Interoperability and Federation Across Bioinformatic Platforms and Resources Workshop at the Plant and Animal Genome Conference.
- Invited to present "A gaggle of geese, a murder of crows, a diversity of impacts" for the Developing and Executing Successful Broader Impact Programs for Current and Future Grants Workshop at the Plant and Animal Genome Conference.
- Invited panel organizer for the Iowa State University Graduate College Emerging Leadership Academy (GC-ELA) discussion on leading a research group.

TEACHING EXPERIENCE

Iowa State University (Instructor)

- **BCBio 322: Introduction to Bioinformatics (undergraduate)** **2015-2019**
 - 3 credits, enrollment limited to 30
 - Responsibility: 100%
 - Problem-oriented, flipped classroom, Modified Moore Method for Inquiry Based Learning
 - Developed the curriculum
 - First to organize and teach this required course for the Bioinformatics and Computational Biology undergraduate major
- **BCBio 110: BCBio Orientation (undergraduate)** **2015-2016**
 - 0.5 credits, ~10 enrolled on average
 - Responsibility: 100%
 - Organized as a seminar series
 - First to organize and teach this required course for the Bioinformatics and Computational Biology undergraduate major
- **ME/GDCB 585: Fundamentals of Predictive Plant Phenomics (graduate)** **2017-2019**
 - 4 credits, includes a lab, enrollment limited to 30
 - Responsibility:
 - 2021: 100% (single instructor; migration to virtual/online content for broad access)
 - 2019: 100% (single instructor).
 - 2017-2018: 25% (1 of 2 instructors)
 - Content: basics in plant science, engineering, and data science. Lecture-based, with some lectures (~15%) delivered by students.
 - Co-developed the curriculum.
 - First to co-organize and co-teach this required course for the Predictive Plant Phenomics specialization.
- **BCB 690: Graduate Student Seminar** **2013-2014, 2017-2019**
 - 1 credit, ~15 enrolled on average.
 - Responsibility: 100%
 - Organized as a seminar series where students learn best practices in scientific seminar preparation and delivery. Students are assessed by peers as well as by the instructor.
- **BCB 691: Faculty Seminar in Bioinformatics** **2017-2018**
 - 1 credit, ~15 enrolled on average.
 - Responsibility: 100%

- Organized as a seminar series where faculty in the graduate Bioinformatics and Computational Biology program describe their research. This serves primarily to familiarize the students with faculty in the program but also enables students to identify research rotation opportunities.

University of Georgia (Teaching Assistant)

- **Protistology Lab** **2001**
 - 1 credit, ~10 enrolled
 - Responsible for 1 section
- **Introduction to Botany Lab** **2000**
 - 1 credit, ~10 enrolled
 - Responsible for 1 section

Texas Tech University (Teaching Assistant)

- **Introduction to Botany Lab** **1996-1997**
 - 1 credit, ~20 enrolled per section
 - Responsible for 3 sections per semester for 3 semesters plus a weekly discussion/video section that included all students across all sections (~120 students total)

MENTORSHIP

Postdoctoral Advisor (2)

Von Mark Cruz (Philippines) ISU (2006)
Joan Peterson (USA) ISU (2007)

PhD Major Professor (5)

Ian Braun ISU Bioinformatics and Computational Biology (USA) (graduated May 2021)
Leila Fattel ISU Genetics and Genomics (Switzerland & Lebanon) (anticipated graduation May 2024)
Mingze He ISU Bioinformatics and Computational Biology (China) (graduated December 2018)
Kokulapalan Wimalanathan ISU Bioinformatics and Computational Biology (Sri Lanka) (graduated December 2018)
Colleen Yanarella ISU Bioinformatics and Computational Biology (USA) (anticipated graduation December 2023)

PhD Co-Major Professor (7)

David Hufnagel ISU Bioinformatics and Computational Biology (USA) (graduated May 2021)
Parnal Joshi ISU Bioinformatics and Computational Biology (India) (anticipated graduation May 2023)
Gaurav Kandoi ISU Bioinformatics and Computational Biology (India) (graduated May 2019)
Nancy Manchanda ISU Bioinformatics and Computational Biology (India) (graduated May 2022)
Viraj Muthye ISU Bioinformatics and Computational Biology (India) (graduated December 2019)
Jacob Stai ISU Bioinformatics and Computational Biology (USA) (anticipated graduation May 2023)
Jesse Walsh ISU Bioinformatics and Computational Biology (USA) (graduated May 2016)

PhD Committees (27)

Ryan Andrews ISU Biochemistry, Biophysics, and Molecular Biology
Nicholas Boerman ISU Plant Breeding
Bhagyaschree Birla ISU Bioinformatics and Computation Biology
Tanner Cook ISU Plant Biology
Li Fan ISU Interdepartmental Genetics and Genomics
Brianna Griffin ISU Plant Biology
David Hessel ISU Interdepartmental Genetics

Sarah Hill-Skinner	ISU Interdepartmental Plant Biology
Katerina Holan	ISU Interdepartmental Plant Biology
Jennifer Jaqueth	ISU Interdepartmental Genetics and Genomics
Roshan Kulkarni	ISU Interdepartmental Genetics and Genomics
Zhaohui Li	ISU Agricultural and Biosystems Engineering
Hung-Ying Lin	ISU Interdepartmental Genetics and Genomics
Ang-Yu Liu	ISU Interdepartmental Genetics and Genomics
Qiang Liu	ISU Interdepartmental Genetics and Genomics
Zachary Lozier	ISU Bioinformatics and Computational Biology
Carla Mann	ISU Bioinformatics and Computational Biology
James McNellie	ISU Interdepartmental Genetics and Genomics
Maxwell McReynolds	ISU Interdepartmental Plant Biology
Divya Mistry	ISU Bioinformatics and Computational Biology
Karthik Murugan	ISU Molecular, Cellular, and Developmental Biology
Sweta Roy-Carson	ISU Bioinformatics and Computational Biology
Matthew Wilkerson	ISU Bioinformatics and Computational Biology
Jenna Hoffman	ISU Interdepartmental Genetics
Liang Ye	ISU Bioinformatics and Computational Biology
Zihao Zheng	ISU Interdepartmental Genetics and Genomics
Naihui (Ashley) Zhou	ISU Bioinformatics and Computational Biology
MS Major Professor (1)	
Vincent (Antonio) Brazelton (USA)	ISU Genetics and Genomics (graduated December 2015) minority
MS Committees (4)	
Jyothi Prasanth Durairaj Rajeswari	ISU Electrical and Computer Engineering
Meghan Harvey	ISU Interdepartmental Genetics
Gokhan Kir	ISU Interdepartmental Genetics
Geyhun Lee	ISU Interdepartmental Genetics
Preparing Future Faculty Scholars (4)	
Stephanie Klein (USA)	ISU Preparing Future Faculty mentorship (research). (2022). Klein, a postdoc, was focused on career transitions.
Keting Chen (China)	ISU Preparing Future Faculty mentorship (research & teaching). (2016-2017).
John Hsieh (USA)	ISU Preparing Future Faculty mentorship (teaching). (2015-2016). Hsieh co-instructed BCBio322x and attended two conferences where he presented seminars (2015 Legacy of R.L. Moore Conference and the 2016 Plant and Animal Genome Conference).
Arun Seetharam (India)	ISU Preparing Future Faculty mentorship (research). (2014-2015).
Fulbright (1)	
Dennis Psaroudakis (Germany)	Invented way to use gene function annotations to carry out comparative functional genomics studies. (2019- 2020).
Undergraduate Students (15)	
Edel Aron (USA)	ISU Mathematics undergraduate honors project research mentorship and BCBio teaching assistantship. Project in FAIR data (2017 & 2018). PhD student, Yale 2018- present.
Haley Dostalík (USA)	ISU Bioinformatics and Computational Biology Undergraduate research for undergraduate honors project research. Project to annotate gene functions to the grape genome (2020). Now a Ph.D. student at Baylor.
Benjamin Escobar (USA)	ISU Computer Science undergraduate research project to design an interface for querying phenotypic

Tiffany Geistkemper (USA)	ISU Mathematics undergraduate research for credit. Python programming to generate QR codes (2019) semantic similarity networks (2020).
Nabil Idris (Malaysia)	ISU Data Science major. Annotated gene functions for many crops (2022).
Olivia Johnson (USA)	ISU Bioinformatics and Computational Biology Undergraduate research. Annotated gene functions to the maize B73 RefGen_v5 genome (2021-2022).
Reka Keleman (Hungary)	ISU Bioinformatics and Computational Biology undergraduate honors project research mentorship. Adapted Morgan2McClintock Translator (http://www.lawrencelab.org/Morgan2McClintock/) to enable a visual output (2010).
Chris Lawrence (USA)	ISU Genetics undergraduate. Learned Perl and Python, added restriction cut-site functionality to CGAT tool (2014-2016). MS Biology, Oklahoma State University 2018. PhD student, Princeton 2018-present.
Madeline McMullen (USA)	ISU Agronomy and Bioinformatics and Computational Biology Project in FAIR data (2018).
Blessing Ngara (Zimbabwe)	ISU Computer Science. Annotated maize gene functions.
Elizabeth Nieves-Perez (USA)	ISU Bioinformatics and Computational Biology undergraduate. Using Python to evaluate differential functionality among multiple CRISPR target prediction tools (2017).
Johnny Perez-Rivera (USA-Puerto Rico)	ISU Biology research project to create a proof-of-concept interface for a Genomes to Fields query tool.
Wiriyarat Ployaram (Thailand)	ISU Bioinformatics research project to map alleles across maize lines.
Kayla Rasch (USA)	Undergraduate research project to annotate gene functions to the blueberry genome (2020).
Dollye Starr (USA)	Undergraduate research. Annotated gene functions to the Brassica rapa genome (2021).
High School Students (1)	
Kiri Johnston (USA)	ISU Cy-TAG (Cyclone Talented and Gifted Program) high school summer research intern. Developed markers to search for the Abnormal 10 chromosome in maize germplasm (2004).

OUTREACH

Led an initiative to bring groups of American Indians students (made up of 3-6 individuals) into plant biological research by involving them in an 8-week research program from 2006-2011. From 2012 onward, this work continued on a more limited basis (1-2 students each summer, depending on available funding). This work has been in collaboration with the George Washington Carver Internship Program at ISU (<https://multicultural.dso.iastate.edu/programs/gwc>). Documentation on summer research programs is available at <https://faculty.sites.iastate.edu/triffid/press-releases>.

Undergraduates (17)

Marcus Begay	Navajo	2008	
Irene Bitsoi	Navajo	2010, 2011	Poster AISES 2010
Danielle Charley	Navajo	2009, 2010, 2011	Poster AISES 2009, 2010
Nathan Etsitty	Navajo	2006, 2007, 2008	
Sharon Garfield	Navajo	2006	
Titus Harrison	Navajo	2006	
Leslie Nelson	Navajo	2009, 2010, 2011	Poster AISES 2009, 2010; NSF

MaGNET travel award to Annual
Maize Genetics Conference, 2013

Zach Nelson	Navajo	2007
Nina Nez	Navajo	2017
Larry Morris, Jr.	Navajo	2009
Alexandra Myhal	Cherokee	2011
Lamour Peshtony	Navajo	2008
TJ Redhouse	Navajo	2009
Regina Sampson	Navajo	2006
Arlyssia Sells	Navajo	2015
Delbert Thompson	Sioux	2006
Alexandra Volker	Cherokee	2006

Recruited. Research effort
with Steve Howell's group.

Poster AISES 2011

Poster AISES 2009

High School Students (2)

Robert Shelltrack	Navajo/Sioux	2007
Jordan Shelltrack	Navajo/Sioux	2007

Tribal Elders (21)

Darryl Bitsoi	Navajo	2006, 2007, 2008
Thomas Bitsoi	Navajo	2008
Judith Bitsoi	Navajo	2010, 2011
Lemanuel Bitsoi	Navajo	2006-present

Translator, Elder

Medicine Man

Elder

D.Ed; MaGNET travel award to Maize
Genetics Conference, 2013. Currently VP for
DEI at Brandeis.

Stanley Bitsoi	Navajo	2008-2011
Rachel Camarillo	Navajo	2007, 2008, 2009
Novalee Nelson	Navajo	2010
Kayden Nelson	Navajo	2010
Jonathan Etsitty	Navajo	2006
Melinda Herrera	Navajo	2011
Lula Jackson	Navajo	2006
Amber Lee	Navajo	2007
Ray Lee	Navajo	2006
Melinda Morris	Navajo	2009
Carolyn Myhal	Cherokee	2011
Cynthia Thompson	Sioux	2006
John Tohtsoni	Navajo	2006
Felix Tulley	Navajo	2006, 2007
Elmer Shelltrack	Sioux	2007
Judy Wilson	Cherokee	2006
Lucinda Yazzie	Navajo	2006

Medicine Man

Elder

Child

Child

Elder

Elder

Translator; Elder

Elder

Medicine Man

Elder

Elder

Elder

High School Educator

Medicine Man

Elder

Elder

Elder

SERVICE TO THE INSTITUTION

ISU (LAST 5 YEARS)

- Serving as a member of the review committee for the dean of Engineering (2023-2024).
- Chaired the search for Professor and Chair, Department of Horticulture (2023).
- Served as the CALS member of the Research Leadership Counsel, a panel organized by the ISU VPR office. (2021-present)
- Facilitated discussion on Advancing data-driven discovery and secure cyber systems for ISU OVPR Research Days (2021).
- Formed and led a committee and design an equitable governance structure that would serve as the foundation for the Department of Agronomy to create a Diversity, Equity, and Inclusion Committee (2020-2021).

- Provided input for ISU involvement, Promotion and Tenure Innovation and Entrepreneurship Recommendations on behalf of the Office of the Vice President for Research (2020-2021).
- Served as a member of the Promotion and Tenure Committee for the Department of Genetics, Development and Cell Biology (2019-2021).
- Invited member, Campus Climate Committee (2018-2019).
- Metagenomics Mondays Summer Seminar Series for the Midwest Big Data Hub Digital Agriculture Spoke. Co-organizer along with Iddo Friedberg and Gwyn Beattie (2018).
- Member, Data Science Task Force for the Office of the Vice President for Research. Chair, Faculty Advisory Committee (2018-2020).
- Interim lead, Midwest Big Data Hub Digital Agriculture Spoke (while J. Colletti served as Interim Associate Dean for the College of Agriculture and Life Sciences). Involved attending MBDH meetings, keeping the Digital Agriculture website content up-to-date, and coordinating with other universities in the Midwest as needed (2017-2019).
- Senior person, NSF-funded Unmanned Aerial Systems, Plant Sciences, and Education grant (while J. Colletti served as Interim Associate Dean for the College of Agriculture and Life Sciences).
- Curriculum Committee, ISU Department of Genetics, Development and Cell Biology (2017-2018).
- Conference organizer (one of five): Novel Candidate Gene Discovery by Computing on Phenotypes. At ISU. Included facility tours, five speakers from ISU, and two speakers brought in from outside institutions (2019).
- Organized the “Biological Ontologies” Fall Seminar Series (2018).
- Member, HPC Committee, Iowa State University (2015-present).
- Member, Data Sciences Curriculum Committee, Iowa State University (2015-2020).

USDA-ARS (SELECTED)

- Selected to serve as a panel member for the USDA-ARS 2014 Research Personnel Evaluation Committee (RPEC), Plant Bioscience Panel Group (2013-2014)
- Charter member, 7-person USDA-ARS Data Advisory Group (DAG) to counsel the Chief Scientific Information Officer for the Agency (Represented 6 National Programs; 2013)
- Organized and hosted the April NSF Phenotype RCN plant subgroup meeting in Ames, IA to plan how best to report outcomes of cross-species phenotype associations (2013).
- Conference Organizer, “Big Data and Computing: Building a Vision for ARS Information Management” (2013)
- Writing team member, Agency advisory whitepaper “Big Data and Computing: Building a Vision for ARS Information Management” (2013)
- Founding Member, Seminar Committee, USDA-ARS Corn Insects and Crop Genetics Research Unit, Ames, IA (2012-2013).
- Appointed member, ARS Midwest Area Outreach, Diversity, and Equal Opportunity Advisory Committee (2007-2009; chair 2009).
- USDA-ARS NP 301 Planning and Coordination Workshop session moderator: “Genome Database Stewardship and Informatics Tool Development” (2006).
- USDA-ARS NP 301 Action Plan Writing Team Member (2005 and 2012).
- Appointed Member, USDA-ARS Ames Area Civil Rights Advisory Committee (2006-2009, serving as elected chair for this committee 2008-2009).
- Facilitator, USDA-ARS National Program 301 (NP 301) Customer and Assessment Workshop third breakout session (2005).

SERVICE TO THE PROFESSION

PROGRAMS AND GRANTS (SELECTED)

- 2021 onward, various programs and grants initiated by Office of Research and Discovery under my leadership. This include (but are not limited to) reviewing Bailey awards, reviewing Presidential Initiatives for the ISU Office of the Vice President for Research, and creating annual Equipment and Infrastructure seed grants for CALS (2021-present) as well as creating the CALS Academy for Team Science, an incubator and Team Science training program.
- University of Nebraska Center for Plant Science Innovation review committee (2021)
- National Science Foundation
 - Panel service
 - NRT, NSF Research Traineeship (2020)
 - Plant Genome Research (2018, 2019)

- ~2 panel invitations per year (often declined due to time constraints)
 - Reverse site visits
 - Advances in Biological Informatics reverse site visit, Protein Database (PDB; 2018, 2023)
 - Advances in Biological Informatics reverse site visit for Araport (2013)
 - *ad hoc* reviews (~4 per year)
- EPPN2020 Review Committee for the European Commission, Directorate-General for Research and Innovation (2020)
- Invited expert panel to review proposals to the German Research Initiative “Computational Life Sciences” (Berlin, 2018; declined)
- USDA ARS, NIFA, and others (various and multiple, ~2 *ad hoc* reviews per year)
- British Biotechnology and Biosciences Research Council (reverse site visits for base funding renewal request for plant sciences centers; London; 2016)
 - Earlham Institute
 - John Innes Centre
 - IBERS (Institute of Biological, Environmental and Rural Sciences)
 - Cross-Institutional Wheat (John Innes Centre, National Institute for Agricultural Botany, University of Nottingham, University of Bristol, and Rothamsted Res.)
- Ohio Plant Biotechnology Consortium Grants Program (2013)
- National Research Support Project - National Animal Genome Research Program (NRSP-8; 2013)

JOURNALS (SOME 90+ REVIEWS)

- | | |
|---|---|
| <ul style="list-style-type: none"> • <i>Bioinformatics</i> • <i>Database</i> • <i>Frontiers in Plant Science</i> • <i>Frontiers in Bioinformatics and Computational Biology (Associate Editor)</i> • <i>Frontiers in Genetics (Associate Editor for Computational Genomics)</i> • <i>Genetics</i> • <i>Genome Biology</i> • <i>International Journal of Plant Genomics</i> • <i>Maydica</i> • <i>Molecular Biology and Evolution</i> • <i>Molecular Biotechnology</i> • <i>Nucleic Acids Research</i> | <ul style="list-style-type: none"> • <i>PeerJ</i> • <i>Plant Cell</i> • <i>Plant Genome</i> • <i>Plants, People, Planet</i> • <i>Plant Physiology</i> • <i>Proceedings of the National Academy of Science, U.S.A.</i> • <i>The Plant Phenome Journal (TPPJ; Associate Editor)</i> • <i>Proteins: Structure, Function, and Bioinformatics</i> • <i>The Plant Phenome Journal</i> • <i>Trends in Cell Biology</i> |
|---|---|

INVITED ADVISORY AND CONSULTANT ACTIVITIES (LAST 5 YEARS)

- Danforth Center for Plant Science, Scientific Advisory Board (2022-present)
- Foundation for Food and Agriculture Research (FFAR) Board of Directors 2 year term – reappointed in 2023 for a 5-year term)
- National Agricultural Producers Data Cooperative Scientific Advisory Board (2021-present)
- North Central Regional Aquaculture Center Board of Directors (2022-present)
- Iowa Corn Club, undergraduate student organization, Iowa State University (2021-2022)
- Member EPPN2020 Review Committee for the European Commission, Directorate-General for Research and Innovation. (2020)
- Invited member American Society of Plant Biologists Science Policy Committee (2018-present)
- Member, Scientific Advisory Board for NSF project entitled “Wheat and Rice Center for Heat Resilience” (2018-present)
- NSF Midwest Big Data Hub Steering Committee member (2018-present)
- Author (one of three primary authors), High Throughput, Field-Based Phenotyping Technologies for the Genomes to Fields (G2F) Initiative whitepaper for NIFA FACT (2018).