

## Dior R. Kelley

3011 Advanced Teaching and Research Building, Ames, IA 50011

Email: [dkelley@iastate.edu](mailto:dkelley@iastate.edu) Phone: (515) 294-2438

ORCID: <https://orcid.org/0000-0001-9186-4186> Twitter: @KelleyDior

Google Scholar page: <https://scholar.google.com/citations?user=y6hm3QMAAAAJ>

### Education

---

Doctor of Philosophy, Plant Biology, 2009, University of California, Davis, CA

Bachelor of Science, Chemistry, 2000, University of California, Santa Cruz, CA

### Professional Appointments

---

- 2019-Present Assistant Professor, Department of Genetics, Development and Cell Biology, Iowa State University
- 2015-18 Adjunct Assistant Professor, Department of Genetics, Development and Cell Biology, Iowa State University
- 2011-14 Postdoctoral Researcher, Division of Biological Sciences, University of California, San Diego (UCSD)
- 2009-11 NIH Postdoctoral Fellow, Salk Institute for Biological Sciences, CA
- 2004-09 Graduate Student, Department of Molecular and Cellular Biology, University of California, Davis (UCD)
- 2002-04 Staff Research Associate, Plant Gene Expression Center, Albany, CA
- 1999-00 Undergraduate Researcher, University of California, Santa Cruz, CA
- 1997-99 Laboratory Assistant, University of California, Santa Cruz, CA

### Publications \* = advised by me; \*\* = undergraduate researcher in my lab

---

Draves M.A.\*\*, Muench, R.L.\*\*, Lang M.G.\*\*, **Kelley D.R.**, (2022) Maize seedling growth and hormone response assays using the rolled towel method. *Current Protocols*, first published Oct 4. <https://doi.org/10.1002/cpz1.562>. *Cover Article*.

McReynolds M.R. \*, Dash L. \*, Montes C., Draves M.A. \*, Lang M.G. \*, Walley J.W., **Kelley D.R.** (2022) Temporal and spatial auxin responsive networks in maize primary roots. *Quantitative Plant Biology*, Volume 3, e21. <https://doi.org/10.1017/qpb.2022.17>

Cowling C.L.\* and **Kelley D.R.** (2021) An unknown protein influences maize yield via sugar and auxin. *New Phytologist*, invited commentary. <https://doi.org/10.1111/nph.18027>

Dash L. \*, McEwan R.E., Montes C., Mejia L.\*\*, Walley J.W., Dilkes B.P., **Kelley D.R.** (2021) *slim shady* is a novel allele of PHYTOCHROME B present in the T-DNA lines SALK\_015201. *Plant Direct*. <https://doi.org/10.1002/pld3.326>.

Olatunji D.\* and **Kelley D.R.** (2020) Auxin. *Reference Module in Life Sciences*. <https://doi.org/10.1016/B978-0-12-819460-7.00132-8>

Ashraf M. A. and **Kelley D.R.** (2020) CAMEL-CANAR regulates PIN trafficking and polarity. *Molecular Plant*, Editors highlights. <https://doi.org/10.1016/j.molp.2020.12.007>

Olatunji D.\* and **Kelley D.R.** (2020) A role for Arabidopsis myosins in sugar-induced hypocotyl elongation. *micropublication Biology*. 10.17912/micropub.biology.000276. <https://www.micropublication.org/journals/biology/micropub-biology-000276/>

Clark N.M., Shen Z., Briggs S.P., Walley J.W., **Kelley D.R.** (2019) Auxin induces widespread proteome remodeling in Arabidopsis seedlings. *Proteomics* Volume 19, Issue 17 September 2019. <https://doi.org/10.1002/pmic.201900199>. *Cover Article*.

Pu Y.\*, Walley J.W., Shen Z., Lang M.\*\*, Briggs S.P., Estelle M., **Kelley D.R.** (2019) Quantitative early auxin root proteomics identifies GAUT10, a galacturonosyltransferase, as a novel regulator of root meristem maintenance. *Molecular and Cellular Proteomics* March 27, 2019, mcp.RA119.001378; <https://doi.org/10.1074/mcp.RA119.001378>. *Cover Article*.

**Kelley D.R.** (2018) E3 ubiquitin ligases: key regulators of hormone signaling in plants. Invited review, *Molecular and Cellular Proteomics* 17 (6): 1047-1054. DOI: <https://doi.org/10.1074/mcp.MR117.000476>.

Gilkerson J., **Kelley D.R.**, Tam R., Estelle M., and Callis J. (2015) Lysine residues are not required for proteasome-mediated proteolysis of the Aux/IAA protein IAA1. *Plant Physiology* 168: 708-720. DOI: <https://doi.org/10.1104/pp.15.00402>.

**Kelley D.R.** and Estelle M. (2012) Ubiquitin-mediated control of plant hormone signaling. Invited review, *Plant Physiology* 160(1): 47-55.

**Kelley D.R.**, Arreola A.\*\*, Gallagher T., and Gasser C.S. (2012) ETTIN (ARF3) physically interacts with KANADI proteins to form a functional complex essential for integument development and polarity determination in *Arabidopsis*. *Development* 139(6): 1105-9.

Walley J.W., **Kelley D.R.**, Savchenko T., and Dehesh K. (2010) Investigating the function of CAF1 deadenylases during plant stress responses. *Plant Signaling & Behavior* 5(7):802-5.

Walley J.W., **Kelley D.R.**, Nestorova G, Hirschberg D, Dehesh K. (2010) *Arabidopsis* deadenylases AtCAF1a and AtCAF1b mediate response to environmental stress. *Plant Physiology* 152(2): 866-75.

**Kelley D.R.**, and Gasser C.S. (2009) Ovule Development: Genetic Trends and Evolutionary Considerations. *Sexual Plant Reproduction* 22(4): 229-34.

**Kelley D.R.**, Skinner D, and Gasser C.S. (2009) Roles of polarity determinants in ovule development. *The Plant Journal* 57(6): 1054-64. (Cover article).

Kaothien P., Ok S.H., Shuai B., Wengier D., Cotter R., **Kelley D.R.**, Kiriakopolos S., Muschiatti J., and McCormick S. (2005) Kinase partner protein interacts with the LePRK1 and LePRK2 receptor kinases and plays a role in polarized pollen tube growth. *The Plant Journal* 42 (4): 492-503.

Tang W.H., **Kelley D.R.**, Ezcurra I., Cotter R., and McCormick S. (2004) LeSTIG1, an extracellular binding partner for the pollen receptor kinases LePRK1 and LePRK2, promotes pollen tube growth in vitro. *The Plant Journal* 39(3): 343-53.

### **Accepted Manuscripts**

---

Clark N.M, Hurgobin B., **Kelley D.R.**, Lewsey M.G., Walley J.W. (2022) Inference of multi-omics networks in plant systems. Accepted at Plant Gene Regulatory Networks, 2<sup>nd</sup> Edition, Methods in Molecular Biology, Springer Nature. Zenodo DOI: <https://doi.org/10.5281/zenodo.6962317>.

### **Preprints**

---

Dash L. \*, Swaminathan S., Simura J., Montes C., Solanki N.\*\*, Mejia L.\*\*, Ljung K., Zabolina O.A., **Kelley D.R.** GAUT10 is required for Arabidopsis root cell differentiation and elongation. *BioRxiv* doi: 10.1101/2023.02.07.527497.

Olatunji D. \*, Clark N.M., **Kelley D.R.** The Class VIII myosin ATM1 is required for root apical meristem function. *BioRxiv* doi: 10.1101/2022.11.30.518567.

Song G., Olatunji D.\*, Montes C., Clark N.M., Pu Y., **Kelley D.R.**, Walley J.W. (2021) Quantitative proteomics reveals extensive lysine ubiquitination in the Arabidopsis root proteome and uncovers novel transcription factor stability states. *BioRxiv* doi: <https://doi.org/10.1101/2021.01.07.425780>.

**Kelley, D.R.**, Shen, Z., Walley, J.W., Chapman, E.J., Briggs, S.P., Estelle, M. (2017) Quantitative proteomic analysis of auxin signaling during seedling development. *BioRxiv* doi: <https://doi.org/10.1101/211532>. Partially published in MCP and Proteomics in 2019.

### **Submitted Manuscripts**

---

Zemlyanskaya E.A., Zemlianski V., Pěňčík A., **Kelley D.R.**, Helariutta Y., Novák O., Růžička K. N6-adenosine methylation of mRNA integrates multilevel auxin response and ground tissue development in Arabidopsis. *Development*, under review.

Dash L. \*, Swaminathan S., Simura J., Montes C., Solanki N.\*\*, Mejia L.\*\*, Ljung K., Zabolina O.A., **Kelley D.R.** GAUT10 is required for Arabidopsis root cell differentiation and elongation. *Plant Physiology*, under review.

Olatunji D. \*, Clark N.M., **Kelley D.R.** The Class VIII myosin ATM1 is required for root apical meristem function. *Development*, under review.

Olatunji D. \*, Dash L. \*, **Kelley D.R.** Interplay between auxin and sugar during plant development. *The Plant Cell*, invited review, under revision.

## **Funding**

---

- 2022 Role: Co-PI, CALS One-time seed grant equipment program, “Optimization of sterol composition in maize roots” total award = \$45,000.
- 2021 Role: Senior Personnel, NSF BIORETS: Biological pathways to adaptability – interactions between genome, epigenome and environment. PI Jeanne Serb, CoPI Maureen Griffin. Amount requested = \$599,937.
- 2021 Role: PI, CALS One-time seed grant equipment program, “Multi-functional benchtop SEM for quantitative phenomics” total award = \$84,330.
- 2021 Role: PI, NSF IOS 08/01/21 – 07/30/24. Regulation of root meristem differentiation by cell wall composition”, total award = \$985,454.
- 2021 Role: PI, ASPB Plant Biology Learning Objectives, Outreach Materials and Education Grant, 09/01/2021-09/01/2022. “Amazing Roots: Adventures in RStudio” total award = \$17,548.
- 2021 Role: PI, ISU Crop Bioengineering Center Seed Grant, 02/03/2021 – 12/31/2021. “Base editing in maize using a Cas-9 nickase to assess the influence of posttranslational protein modifications in vivo” total award = \$20,000.
- 2020 Role: PI, USDA NIFA AFRI 06/01/20 – 05/30/23. Project No. IOW05613, “Roles of auxin pathways driving maize root growth”, total award = \$474,944.
- 2019 Role: Co-PI, USDA Hatch Project No. IOW03649. “Studying the mechanisms of stress tolerance during crop reproductive development”.
- 2019 Role: PI, American Association of University Women Research Publication Grant. “Roles of an auxin regulated myosin in seedling development”, total award = \$28,874.

## **Awards and Honors**

---

- 2022 GDCB Early-Career Research Award
- 2017 American Society of Plant Biologists WYITA award (\$1,000)
- 2015 Cell Signaling Technology PTMscan Kit prize winner (\$2,375)
- 2011 NIH Ruth L. Kirschstein NRSA Postdoctoral Fellowship (\$47,606)
- 2010 Pioneer Fund Postdoctoral Fellowship, competitively awarded, Salk Institute for Biological Studies (\$37,368)
- 2009 Graduate Student Travel Award, 20<sup>th</sup> ICAR
- 2005-08 Trainee, NIH MCB Graduate Training Grant, competitively awarded.
- 2007 NSF MORPH Travel Grant

## **Teaching and Mentorship**

---



---

2022	Preparing Future Faculty Mentor (Dinakaran Elango, postdoc)
2022	NSF BIORETS Research Experience for Teachers mentor
2020-21	Preparing Future Faculty Mentor (Brianna Griffin, PIB/P3 PhD student)
2021	BIOL 313, Principles of Genetics, 3 credits (online).
2021	GEN 496, Attendance and Critique of Genetics Seminars, 1 credit.
2020	BIOL 420X, Plant Molecular Biology, 3 credits (developed course).
2019, '21	GDCB 545, Plant Molecular, Cell and Developmental Biology, 3 credits.
2019	BCB 593, Workshop in Bioinformatics, 1 credit (revised course).
2018, '21	GEN 409, Molecular Genetics, 3 credits.
2016, '17	GDCB 544, Fundamentals of Bioinformatics, 4 credits (revised course).
2016	GENET 690, Graduate Seminar, 1 credit.
2015-present	BIO/GEN 499, Undergraduate Research Experience. Mentored twelve females and two Hispanic undergraduates to date.

### **Outreach**

---

2022	IN PLANTA: Inclusive Practices Leveraging Arabidopsis as a Nexus for Training & Application, Workshop Co-host, International Conference on Arabidopsis Research, Belfast, Ireland <i>virtual format</i>
2022	“Amazing Roots” Science Bound Residential Course Instructor
2021-present	Science Bound Saturdays Faculty Instructor
2021	AAUW-Ames Ad-Hoc Diversity Committee member
2019-present	Botany4Tots, preschool outreach program creator & director
2015	Resident Scientist, McCombs Middle School, Des Moines, IA
2014	Mentor, UC-Howard summer program (UC-HBCU initiative)
2014	Outreach Instructor, Roosevelt middle school workshop

### **Leadership**

---

2022-23	Research Collaboration Catalysts 2022-2023 Cohort
2022-23	Front & Center Initiative, NAASC representative
2021-24	American Society for Plant Biologists Education Committee
2021-26	North American Arabidopsis Steering Committee (NAASC)
2021-26	NAASC Early Career Scholar Subcommittee Co-Chair

### **Service**

---

2021-23	ISU Crop Bioengineering Center council member
2021-present	ISU BCB Supervisory Committee
2021-22	ISU BCB Admissions Committee Chair
2021	ISU Plant Transformation Facility Task Force
2021	Reviewer, Veni Grant Program, Dutch Research Council
2021	Reviewer, USDA NIFA AFRI Program
2021-22	Reviewer, NSF IOS programs
2019-Present	ISU IPB Admissions Committee Chair

- 2019 Loomis Symposium Organizer, Iowa State University  
 2018-21 Faculty Advisor, ISU BCB Graduate Student Organization  
 2017-20 ISU CALS Diversity & Inclusion Committee member  
 2016-Present Departmental Seminar Committee, GDCB, Iowa State University  
 2017-Present American Society of Plant Biologists member  
 2016-Present ISU IGG Curriculum Committee  
 2016-Present Faculty LEA/RN group member (learning-centered techniques)  
 2015-18 Art in State Buildings committee, Iowa State University.  
 2004-09 Recruitment & Event Organizer, Plant Biology Graduate Group

### **Editorial Boards**

---

- 2021 – present Advisory Board, *New Phytologist*  
 2021 – present Review Editor, *Frontiers in Plant Science*

### **Manuscript Peer Review**

---

*Nature Plants, Nature Communications, Molecular Biology and Evolution, New Phytologist, Molecular & Cellular Proteomics, Scientific Reports, Annals of Botany, International Journal of Plant Molecular Biology, Frontiers in Plant Science, EMBO Reports, micropublication.*

### **Presentations**

---

#### ***International oral presentations (3 since appointment to Asst. Prof.)***

- 2023 New players in sugar-mediated root growth, Seminar Series in Plant Molecular Genetics, Weizmann Institute of Science, Israel.  
 2022 Regulation of maize root growth by auxin pathways, AUXIN 2022 conference, Cavtat, Croatia.  
 2022 Temporal and spatial auxin responsive networks in maize primary roots, International Conference on Arabidopsis Research (ICAR), Belfast, Ireland.

#### ***National oral presentations (8 since appointment to Asst. Prof.)***

- 2023 Influences of auxin on maize root morphogenesis, Virginia Tech Life Sciences Seminars, Blacksburg, VA.  
 2022 Regulation of maize root growth by auxin pathways, Pre-Maize Development Meeting, 64<sup>th</sup> Annual Maize Genetics Meeting, St. Louis, MO.  
 2022 Discovering genetic drivers of auxin dependent phenotypes in maize, Phenomics Phridays, Ames, IA – held virtually.  
 2022 Roles of auxin pathways driving maize growth, Early Career Speaker, Corn Breeding Research Meeting – held virtually.  
 2021 Roles of auxin pathways driving maize root growth, Local Hormone Meeting, Duke

University, Durham, NC.

- 2021 Linking proteotype to phenotype during root development, University of Massachusetts Amherst Plant Biology seminar, Amherst, MA – held virtually.
- 2019 Linking proteotype to phenotype during auxin signaling, Donald Danforth Plant Sciences Center, St. Louis, MO.
- 2019 Linking proteotype to phenotype during auxin signaling, Keynote Speaker, Local Auxin Meeting, Tyson Research Center, St. Louis, MO.

***Local oral presentations (10 since appointment to Asst. Prof.)***

- 2023 Influences of auxin on maize root morphogenesis, GDCB Research Day, Ames, IA.
- 2022 Discovering auxin regulated phenotypes from proteotypes, ISU Genetics Club, Ames IA.
- 2021 Base editing in maize using a Cas9-nickase to assess the influence of posttranslational protein modifications *in vivo*, Crop Bioengineering Center Annual Meeting, Ames, IA – held virtually.
- 2021 Roles of an auxin regulated myosin in seedling development, American Association of University Women Ames Chapter, Ames, IA.
- 2021 Roles of auxin in plant growth, ISU CALS Building Community Digital/Precision Agriculture Research, Ames, IA – held virtually.
- 2021 Proteotypes to phenotypes, ISU Bioinformatics and Computational Biology graduate program seminar, Ames, IA.
- 2020 Linking proteotype to phenotype during auxin signaling, ISU Interdepartmental Plant Biology Graduate program seminar, Ames, IA.
- 2020 Linking proteotype to phenotype during auxin signaling, ISU Bioinformatics and Computational Biology graduate program seminar, Ames, IA.
- 2020 Roles of auxin pathways driving maize root growth, ISU GDCB departmental seminar, Ames, IA.
- 2019 Speaker, ISU Bioinformatics and Computational Biology graduate program annual meeting, Ames, IA. Linking proteotype to phenotype during auxin signaling.

***Poster presentations – National (8 since appointment to Asst. Prof.)***

(\*Asterisk denotes undergraduate authors; underlined names denote advisees; presenter indicated in bold)

- 2023 **Cowling C**, Homayouni A, McReynolds M, Draves M\*, Lang M\*, Ke H, Dehesh K, Strader L, Walley J, Kelley D. Roles of auxin transporter PILS6 in maize growth and development, 65<sup>th</sup> Annual Maize Genetics Conference, St. Louis, MO.
- 2023 **Dash L**, McReynolds M, Draves M\*, Khangura R, Cowling C, Lang M\*, Dilkes BP, Walley JW, Kelley DR. The Auxin Response Factor ARF27 is required for maize root morphogenesis, 65<sup>th</sup> Annual Maize Genetics Conference, St. Louis, MO.
- 2022 **Olatunji D**, Clark NM, Kelley DR. The class VIII myosin ATM1 is integral for root

apical meristem function, Plant Molecular Biology Gordon Research Conference, Holderness, VT.

- 2022 **McReynolds MR**, **Dash L**, Montes C, Draves MA\*, Lang MG\*, Walley JW, **Kelley DR**. Temporal and spatial auxin responsive networks in maize primary roots, 64<sup>th</sup> Annual Maize Genetics Conference, St. Louis, MO.
- 2022 **McReynolds MR**, Draves MA\*, Dash L, Cowling C, Lang MG\*, Walley JW, Kelley DR. The auxin response factor *ZmARF27* is required for maize root morphogenesis, 64<sup>th</sup> Annual Maize Genetics Conference, St. Louis, MO.
- 2022 **Cowling C**, Draves MA\*, Homayouni A, **McReynolds MR**, Lang MG\*, Strader LC, Walley JW, **Kelley DR**. Roles of putative auxin transporters in root growth and development, 64<sup>th</sup> Annual Maize Genetics Conference, St. Louis, MO.
- 2022 **Draves MA\***, **Muench R\***, Khangura R, Smith S\*, Mejia L\*, Stroyan J, Walley JW, Dilkes BP, Kelley DR. Genome wide association studies of auxin response in maize seedlings using the Wisconsin Diversity panel, 64<sup>th</sup> Annual Maize Genetics Conference, St. Louis, MO.
- 2020 **Lang MG\***, **Pu Y**, Ke H, Dehesh K, Kelley DR. Identification of novel auxin pathway proteins regulating maize root development, 62<sup>nd</sup> Annual Maize Genetics Conference, Hawaii (moved to virtual due to COVID).

***Poster presentations – Local (6 since appointment to Asst. Prof.)***

- 2023 **Cowling C**, Homayouni A, McReynolds MR, Draves MA, Lang MG, Ke H, Dehesh K, Srader LC, Walley JW, Kelley DR. Genetics, Development and Cell Biology Annual Research Day, Ames, IA.
- 2023 **Marshall J\***, **Cowling C**, Kelley DR. Exploring the phenotypic effects of PILS2 and PILS6 proteins in Zea mays and Arabidopsis. American Society of Plant Biologists Midwestern Section Conference, Ames, IA.
- 2022 **Marshall J\***, **Cowling C**, Kelley DR. Exploring the phenotypic effects of PILS2 and PILS6 proteins in Zea mays and Arabidopsis. ISU Life Science Research Poster Symposium, Ames, IA.
- 2021 **Draves MA\***, **Muench R\***, Khangura R, Smith S\*, Mejia L\*, Stroyan J, Walley JW, Dilkes, BP, Kelley DR. Genetic investigation of Maize Auxin Responses, Research in the Capitol, Des Moines, IA.
- 2019 **Dash L**, Kelley DR. Galacturonosyltransferase10 (GAUT10): a novel regulator of root meristem maintenance via cell wall modification, Genetics Development and Cell Biology Research Day, Ames, IA.
- 2019 **Loo WT\***, Kelley DR. Auxin regulated hypocotyl growth: identifying new regulators. Genetics, Development and Cell Biology Research Day, Ames, IA.