

TREVOR M. NOLAN

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EDUCATION

Iowa State University 2013 - 2018
Ph.D. in Genetics and Genomics
Plant Sciences Institute and Brown Graduate Fellow

Iowa State University 2009 - 2013
B.S. in Genetics
summa cum laude and Honors Program

RESEARCH EXPERIENCE

Postdoctoral Researcher July 2019-Ongoing
Laboratory of Philip Benfey, Duke University

Postdoctoral Researcher December 2018 - July 2019
Laboratory of Yanhai Yin, Iowa State University
Network Based Discovery of Brassinosteroid Regulation of Plant Growth and Stress Responses in Arabidopsis.

Graduate Research Assistant 2014 - 2018
Laboratory of Yanhai Yin, Iowa State University
To Grow or Survive: Plants Modulate Brassinosteroid-Regulated Transcription Factor BES1 During Drought to Mediate Growth-Stress Tradeoffs.

Undergraduate Research Assistant 2011-2013
Laboratory of Steven Rodermel, Iowa State University
Alternate Pathways of Electron Transport in the Plastid: Modulation of VTE1 in *immutans*.

PUBLICATIONS

18. Shahan, R., **T. Nolan** and P. Benfey. 2021. Single-cell analysis of cell identity in the Arabidopsis root apical meristem: insights and opportunities. *Journal of experimental botany*. <https://doi.org/10.1093/jxb/erab228>
17. **Nolan, T.**, N. Vukasinovic, D. Liu, J. Russinova and Y. Yin. 2020. Brassinosteroids: Multidimensional Regulators of Plant Growth, Development and Stress Responses. *Plant Cell*. 32 (2), 295-318. <https://doi.org/10.1105/tpc.19.00335>
16. Jiang, H., B. Tang, Z. Xie, **T. Nolan**, H. Ye, G. Song, J. Walley and Y. Yin. 2019. GSK3-Like Kinase BIN2 Phosphorylates RD26 to Potentiate Drought Signaling in Arabidopsis. *The Plant Journal*. <https://doi.org/10.1111/tpj.14484>
15. Xie, Z., **T. Nolan**, H. Jiang, B. Tang, M. Zhang, Z. Li and Y. Yin. 2019. The AP2/ERF Transcription Factor TINY Modulates Brassinosteroid-Regulated Plant Growth and Drought Response in Arabidopsis. *Plant Cell*. 31 (8), 1788-1806. <https://doi.org/10.1105/tpc.18.00918>
14. Wang, P., **T. Nolan**, Y. Yin and D. Bassham. 2019. Identification of a transcription factor-centered regulatory network of autophagy genes in Arabidopsis. *Autophagy*. 1-17. <https://doi.org/10.1080/15548627.2019.1598753>

13. Xie, Z., **T. Nolan**, H. Jiang and Y. Yin. 2019. AP2/ERF Transcription Factor Regulatory Networks in Hormone and Abiotic Stress Responses in Arabidopsis. *Frontiers in Plant Science*. 10, 228. <https://doi.org/10.3389/fpls.2019.00228>
12. Guo, H., **T. Nolan**, Z. Xie, G. Song, J. Walley and Y. Yin. 2018. FERONIA Receptor Kinase Contributes to Plant Immunity by Suppressing Jasmonic Acid Signaling in Arabidopsis thaliana. *Current Biology*. 28 (20), 3316-3324. <https://doi.org/10.1016/j.cub.2018.07.078>
11. **Nolan, T.**, J. Chen, and Y. Yin. 2017. Cross-talk of Brassinosteroid signaling in controlling growth and stress responses. *Biochemical Journal*. 474 (16), 2641-2661. <https://doi.org/10.1042/BCJ20160633>
10. Chen, J., **T. Nolan**, H. Ye, M. Zhang, H. Tong, P. Xin, J. Chu, C. Chu, Z. Li, and Y. Yin. 2017. Arabidopsis WRKY46, WRKY54 and WRKY70 Transcription Factors Are Involved in Brassinosteroid-Regulated Plant Growth and Drought Response. *Plant Cell*. 29 (6), 1425- 1439. <https://doi.org/10.1105/tpc.17.00364>
9. **Nolan, T.**, B. Brennan, M. Zhang, M. Yang, J. Chen, M. Zhang, Z. Li, X. Wang, D. Bassham, J. Walley, and Yin, Y. 2017. Selective Autophagy of BES1 Mediated by DSK2 Balances Plant Growth and Survival. *Developmental Cell*. 41 (1), 33-46. <https://doi.org/10.1016/j.devcel.2017.03.013>
 - Featured in *Science Signaling*, *BioTechniques*, *SciencDaily* and *Iowa Farmer Today*.
8. Yang, M., C. Li, Z. Cia, Y. Hu, **T. Nolan**, F. Yu, Y. Yin, Q. Xie, G. Tang and X. Wang. 2017. SINAT E3 ligases control the light-mediated stability of the brassinosteroid-activated transcription factor BES1 in Arabidopsis. *Developmental Cell*. 41 (1), 47-58. <https://doi.org/10.1016/j.devcel.2017.03.014>
7. Ye, H., S. Liu, B. Tang, J. Chen, Z. Xie, **T. Nolan**, H. Jiang, H. Guo, H. Lin, L. Li, Y. Wang, H. Tong, M. Zhang, C. Chu, Z. Li, M. Aluru, S. Aluru, P. Schnable and Y. Yin. 2017. RD26 mediates crosstalk between drought and Brassinosteroid signaling pathways. *Nature Communications*. 8, 14573. <https://doi.org/10.1038/ncomms14573>
6. Jiang, H., X. Want, **T. Nolan**, Y. Yin, M. Aluru and L. Dong. 2017. Automated microfluidic plant chips-based plant phenotyping system. *IEEE 12th International Conference on Nano/Micro Engineered and Molecular Systems (NEMS)*. 756-760. <https://doi.org/10.1109/NEMS.2017.8017129>
5. **Nolan, T.**, H. Guo, S. Liu, L. Li, P. Schnable, and Y. Yin. 2016. Identification of Brassinosteroid Target Genes by Chromatin Immunoprecipitation Followed by High-throughput Sequencing (ChIP-seq) and RNA-seq. *Brassinosteroid Analysis Book*. https://doi.org/10.1007/978-1-4939-6813-8_7
4. Pogorelko, G., S. Kambakam, **T. Nolan**, A. Foudree, O. Zabolina and S. Rodermel. 2016. Impaired Chloroplast Biogenesis in Immutans, an Arabidopsis Variegation Mutant, Modifies Developmental Programming, Cell Wall Composition and Resistance to Pseudomonas syringae. *Plos one*. 11, 4. <https://dx.doi.org/10.1371%2Fjournal.pone.0150983>
3. Wang, X., J. Chen, Z Xie, S Liu, **T. Nolan**, H. Ye, M. Zhang, H. Guo, P. Schnable, Z. Li, and Y. Yin. 2014. Histone Lysine Methyltransferase SDG8 Is Involved in Brassinosteroid-Regulated Gene Expression in Arabidopsis thaliana. *Molecular Plant* 7, 1303- 1315. <https://doi.org/10.1093/mp/ssu056>
2. Putarjunan, A., X. Liu , **T. Nolan**, F. Yu , and S. Rodermel. 2013. Understanding chloroplast biogenesis using second-site suppressors of *immutans* and *var2*. *Photosynthesis Research* 116, 437-453. <https://doi.org/10.1007/s11120-013-9855-9>

1. Foudree, A., A. Putarjunan, S. Kambakam, **T. Nolan**, J. Fussell, G. Pogorelko, and S. Rodermel. 2012. The Mechanism of Variegation in *immutans* Provides Insight into Chloroplast Biogenesis. *Frontiers in Plant Science* 3, 260. <https://doi.org/10.3389/fpls.2012.00260>

SELECTED TALKS

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| 19. NSF PGRP Awardee Meeting. | September 10th, 2020. |
| 18. Plant Genomes in a Changing Environment. Virtual Conference. | October 12-14, 2020. |
| 17. Bioinformatics and Computational Biology Symposium. Iowa State University. | May 1st, 2020. |
| 16. Plant Genomes in a Changing Environment. Virtual Conference. | October 12-14, 2020. |
| 15. Climate Change-Linked Stress Tolerance in Plants. Hannover, Germany. | May 13-16, 2019. |
| 14. Centre for Research in Agricultural Genomics. Barcelona, Spain. | May 9th, 2019. |
| 13. Plant Sciences Institute Board Meeting. Ames, IA. | April 5, 2019. |
| 12. 3rd International Conference on Brassinosteroid Research. San Diego, CA. | August 1-4, 2018. |
| 11. Salk Institute for Biological Studies. San Diego, CA. | July 31st, 2018. |
| 10. Duke University. Durham, NC. | July 26th, 2018. |
| 9. Plant Biology 2018. Montreal, Quebec, Canada. | July 14-18, 2018. |
| 8. University of California San Diego. San Diego, CA. | March 13th, 2018. |
| 7. Workshop on Plant Development and Drought Stress. Pacific Grove, CA. | November 5-8, 2017. |
| 6. International Conference on Arabidopsis Research. St. Louis, MO. | June 19-23, 2017. |
| 5. Post-transcriptional Gene Regulation in Plants Meeting. Austin, TX. | July 14-15, 2016. |
| 4. Plant Biology 2016. Austin, TX. | July 9-13, 2016. |
| 3. GDCB Brown Bag Seminar Series. Ames, IA. | November 11th, 2015. |
| 2. International Conference on Arabidopsis Research. Paris, France. | July 5-9, 2015. |
| 1. Crop Bioengineering Consortium Summer 2015 Meeting. Ames, IA. | June 17-18, 2015. |

POSTER PRESENTATIONS

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| 9. Climate Change-Linked Stress Tolerance in Plants. Hannover, Germany. | May 13-16, 2019. |
| 8. Walter E and Helen Parke Loomis Lecture and Mini-Symposium. Ames, IA. | May 6th, 2019. |
| 7. Novel candidate gene discovery by computing on phenotypes. Ames, IA. | April 3rd, 2019. |
| 6. 1st International Plant Systems Biology Meeting. Roscoff, France. | September 10-14, 2018. |
| 5. Loomis and Crop Bioengineering Consortium 2018 Meeting. Ames, IA. | May 8-10, 2018. |
| 4. Predictive Crop Design: Genome-to-phenome. Lincoln, NE. | April 6-7, 2017. |
| 3. ASPB Midwest Section Meeting. Chicago State University, Chicago, IL. | March 23-24th, 2013. |
| 2. Plant Biology 2012. Austin, TX. | July 20-24, 2012. |
| 1. ASPB Midwest Section Meeting. University of Nebraska, Lincoln, NE | March 24-25, 2012. |

TEACHING

Teaching Assistant <i>Genetics Laboratory (Genetics 313L)</i>	Spring 2018 <i>Iowa State University</i>
Guest Lecturer <i>Molecular Genetics (Genetics 409)</i>	Fall 2016 <i>Iowa State University</i>
Guest Lecturer <i>Transmission Genetics (Genetics 510)</i>	Spring 2016 <i>Iowa State University</i>
Tutor <i>Principles of Genetics (Genetics 313)</i>	Fall 2012 <i>Iowa State University</i>
Undergraduate Teaching Assistant <i>Principles of Genetics (Genetics 313 and 313L)</i>	Fall 2011 <i>Iowa State University</i>

MENTORING

Mentor in Research Experience for Teachers Program

Nick Smith, Eagle Grove High School	2017-2018
Brent Chambers, Bellevue High School	2014

Mentor for First Year Graduate Students

Tanner Cook	2018
Ashley Paulsen	2017
Basanta Bista	2017
Max McReynolds	2016
Jie Tang	2016

Mentor for Undergraduate Lab Assistants

Ashley Hurd	2018-Present
Nicole Huser	2016-Present
Sean McLaughlin	2016-Present
Jessica Parrott	2016
Paige Rassel	2016
Kyle Small	2016
Ben Brennan	2014-2015

AWARDS AND FELLOWSHIPS

NSF National Plant Genome Initiative Postdoctoral Research Fellow <i>Duke University</i>	2020-2023
Zaffarano Prize for Graduate Student Research <i>Iowa State University</i>	2019
Karas Award for an Outstanding Dissertation <i>Iowa State University</i>	2019
Genetics, Development and Cell Biology Award <i>Iowa State University</i>	2019
Genetics and Genomics Research Excellence Award <i>Iowa State University</i>	2018

Biochemical Journal Poster Award - 1st Place <i>3rd International Conference on Brassinosteroid Research, San Diego, CA</i>	2018
Best Poster Presentation by a Graduate Student <i>Loomis and Crop Bioengineering Consortium Meeting, Ames, IA</i>	2018
Brown Graduate Fellow <i>Iowa State University</i>	2016-2017
Plant Sciences Institute Fellow <i>Iowa State University</i>	2013-2017
Travel Awards	
Crop Bioengineering Center Travel Grant	2019
Iowa State University W.E. Loomis award for travel to Plant Biology	2018
Workshop on Plant Development and Drought Resistance	2017
Iowa State University W.E. Loomis award for travel to Plant Biology	2017
Iowa State University W.E. Loomis award for travel to Plant Biology	2016
Iowa State University GDCB travel award to the ICAR	2015
Best Oral Presentation by a Graduate Student <i>Post-transcriptional Gene Regulation in Plants Meeting, Austin, TX</i>	2016
Best Poster Presentation by an Undergraduate Student <i>ASPB Midwest Meeting, Chicago, IL</i>	2013
Research in Genetics Summer Undergraduate Internship <i>Sui Tong Chan Fung Fund for the Promotion of Study, Iowa State University</i>	2012

GRANTS

Reconstructing spatial-temporal responses to drought in Arabidopsis and rice using time series single-cell transcriptomics <i>PI: Trevor M. Nolan</i>	2020-2023
NSF National Plant Genome Initiative Postdoctoral Research Fellowship in Biology	
Network-Based Discovery of Brassinosteroid Regulation of Plant Growth and Stress Responses in Arabidopsis <i>PI: Yanhai Yin Co-PI: Justin Walley</i>	2018-2021
Role: Led the development and writing of this funded proposal from the NSF Division of Molecular and Cellular Biosciences Cellular Dynamics and Function cluster.	
Crosstalk between Brassinosteroid and autophagy pathways in the regulation of plant growth and stress responses <i>PI: Yanhai Yin Co-PIs: Diane Bassham and Justin Walley</i>	2017-2020
Role: Generated preliminary data, participated in writing and designed experimental approach for this funded NIH R01 proposal.	

PROFESSIONAL ACTIVITIES

Sigma Xi Scientific Research Society	2019
Graduate Student Representative <i>Genetics, Development and Cell Biology Faculty Search Committee</i>	2017

Iowa State University Crop Bioengineering Center Member	2014-2019
American Society of Plant Biologists Member	2012-Present
Ad Hoc Reviewer	
Independent manuscript reviews	
<i>Plant Cell</i>	2018, 2020, 2021
<i>Planta</i>	2019
Mentored reviews under Dr. Yanhai Yin	
<i>New Phytologist, PNAS, Developmental Cell, Plant Biotechnology Journal</i>	2016-2018

REFERENCES

Dr. Philip Benfey, Professor

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Dr. Yanhai Yin, Professor

Iowa State University

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Dr. Diane Bassham, Professor

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Dr. Stephen Howell, Professor

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Dr. Justin Walley, Assistant Professor

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