

Xiaochen Yuan

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PROFESSIONAL APPOINTMENTS

- 2023- Adjunct Assistant Professor, Iowa State University (ISU)
2019-2022 Postdoctoral Research Associate, Michigan State University (MSU)
2016-2019 Postdoctoral Research Associate, University of Wisconsin-Milwaukee (UW-Milwaukee) and Jiangsu Academy of Agricultural Sciences, China

EDUCATION

- 2016 Ph.D. in Biological Sciences, UW-Milwaukee
2011 B. S. in Biological Engineering, Northwest A&F University, China
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RESEARCH

Manuscripts in revision, review, or preparation

1. S. M. Slack, **X. Yuan**, C. A. Outwater, and G. W. Sundin. Further evaluation of ASM and ProCa for shoot blight management. *Phytopathology*, 2024, in prep.

Peer-reviewed research papers ([†]contributed equally, ^{*}corresponding author)

1. B. Banerjee[†], **X. Yuan[†]**, and C-H. Yang*. Dissecting the Molecular Dance: c-di-GMP, cAMP-CRP, and VfmH collaboration in pectate lyase regulation for *Dickeya dadantii*. *Microbiology Spectrum*, 2023, accepted. <https://doi.org/10.1128/spectrum.01537-23>
2. **X. Yuan**, K. Gdanetz, C. A. Outwater, S. M. Slack, and G. W. Sundin*. Evaluation of plant defense inducers and plant growth regulators for fire blight management using transcriptome studies and field assessments. *Phytopathology*, 2023, accepted. <https://doi.org/10.1094/PHYTO-04-23-0147-KC>
3. **X. Yuan**, G. W. Sundin, Q. Zeng, K. B. Johnson, K. D. Cox, M. Yu, H. Juan, and C-H. Yang*. *Erwinia amylovora* type III secretion system inhibitors reduce fire blight infection under field conditions. *Phytopathology*, 2023, accepted. <https://doi.org/10.1094/PHYTO-04-23-0111-SA>
4. L. Fang, B. Banerjee, **X. Yuan**, Q. Zeng, C. Liang, X. Chen*, and C-H. Yang*. Genetic and environmental investigation of a novel phenylamino acetamide inhibitor of the *Pseudomonas aeruginosa* type III secretion system. *Applied and Environmental Microbiology*, 2023, 89(1), e01752-22. <https://doi.org/10.1128/aem.01752-22>
5. **X. Yuan**, L. I. Eldred, and G. W. Sundin*. Exopolysaccharides amylovoran and levan contribute to sliding motility in the fire blight pathogen *Erwinia amylovora*. *Environmental Microbiology*, 2022, 24(10), 4738-4754. <https://doi.org/10.1111/1462-2920.16193>
6. **X. Yuan**, L. I. Eldred, R. R. Kharadi, S. M. Slack, and G. W. Sundin*. The RNA-binding protein ProQ impacts exopolysaccharide biosynthesis and second messenger cyclic di-GMP signaling in the fire blight pathogen *Erwinia amylovora*. *Applied and Environmental Microbiology*, 2022, 88(9), e00239-22 (featured in Spotlight). <https://doi.org/10.1128/aem.00239-22>
7. **X. Yuan**, G. C. McGhee, S. M. Slack, and G. W. Sundin*. A novel signaling pathway that connects thiamine biosynthesis, bacterial respiration, and production of the exopolysaccharide amylovoran in *Erwinia amylovora*. *Molecular Plant-Microbe Interactions*,

- 2021, 34(10): 1193-1208 (featured in the research highlight on the MPMI monthly review).
<https://doi.org/10.1094/MPMI-04-21-0095-R>
- 8. **X. Yuan**, Q. Zeng, J. Xu, G. B. Severin, X. Zhou, C. M. Waters, G. W. Sundin, A. M. Ibekwe, F. Liu, and C-H. Yang*. Tricarboxylic acid (TCA) cycle enzymes and intermediates modulate intracellular cyclic di-GMP levels and the production of plant-cell-wall degrading enzymes in soft rot pathogen *Dickeya dadantii*. *Molecular Plant-Microbe Interactions*, 2020, 33(2): 296-307. <https://doi.org/10.1094/MPMI-07-19-0203-R>
 - 9. **X. Yuan**, Q. Zeng, D. Khokhani, F. Tian, G. B. Severin, C. M. Waters, J. Xu, X. Zhou, G. W. Sundin, A. M. Ibekwe, F. Liu*, and C-H. Yang*. A feed-forward signaling circuit controls bacterial virulence through linking cyclic di-GMP and two mechanistically distinct sRNAs; ArcZ and RsmB. *Environmental Microbiology*, 2019, 21(8): 2755-2771.
<https://doi.org/10.1111/1462-2920.14603>
 - 10. Z. Cui, C-H. Yang, R. R. Kharadi, **X. Yuan**, G. W. Sundin, L. R. Triplett, J. Wang, and Q. Zeng*. Cell-length heterogeneity: a population-level solution to growth/virulence trade-offs in the plant pathogen *Dickeya dadantii*. *PLoS Pathogens*, 2019, 15(8): e1007703.
<https://doi.org/10.1371/journal.ppat.1007703>
 - 11. **X. Yuan†**, F. Tian†, C. He, G. B. Severin, C. M. Waters, Q. Zeng, F. Liu*, and C-H. Yang*. The diguanylate cyclase GcpA inhibits the production of pectate lyases via the H-NS protein and RsmB regulatory RNA in *Dickeya dadantii*. *Molecular Plant Pathology*, 2018, 19(8): 1873-1886. †co-first authors. <https://doi.org/10.1111/mpp.12665>
 - 12. H. Li, D. Xue, F. Tian, **X. Yuan**, F. Yang, H. Chen, W. Hutchins, C-H. Yang, and C. He*. *Xanthomonas oryzae* pv. *oryzae* response regulator TriP regulates virulence and exopolysaccharide production via interacting with c-di-GMP phosphodiesterase PdeR. *Molecular Plant-Microbe Interactions*, 2018, 32(6): 729-739. <https://doi.org/10.1094/MPMI-09-18-0260-R>
 - 13. D. Xue, F. Tian, F. Yang, H. Chen, **X. Yuan**, C-H. Yang, Y. Chen, Q. Wang, and C. He*. Phosphodiesterase EdpX1 promotes virulence, exopolysaccharide production and biofilm formation in *Xanthomonas oryzae* pv. *oryzae*. *Applied and Environmental Microbiology*, 2018, 84, e01717-e01718. <https://doi.org/10.1128/AEM.01717-18>
 - 14. Z. Cui, **X. Yuan**, C-H. Yang, R. B. Huntley, W. Sun, J. Wang, G. W. Sundin, and Q. Zeng*. Development of a method to monitor gene expression in single bacterial cells during the interaction with plants and use to study the expression of the type III secretion system in single cells of *Dickeya dadantii* in potato. *Frontiers in Microbiology*, 2018, 9: 1429. <https://doi.org/10.3389/fmicb.2018.01429>
 - 15. B. Thakur, G. Zhou, J. Chang, H. Pu, B. Jin, X. Sui, **X. Yuan**, C-H. Yang, M. Magruder, and J. Chen*. Rapid Detection of Single *E. coli* Bacteria Using a Graphene-based Field-Effect Transistor Device. *Biosensors and Bioelectronics*, 2018, 110: 16-22.
<https://doi.org/10.1016/j.bios.2018.03.014>
 - 16. Q. Zeng*, Z. Cui, J. Wang, K. L. Childs, G. W. Sundin, D. R. Cooley, C-H. Yang, E. Garofalo, A. Eaton, Regan B. Huntley, **X. Yuan**, and N. P. Schultes. Comparative genomics of Spiraeoideae-infecting *Erwinia amylovora* strains provides novel insight to genetic diversity and identifies the genetic basis of a low-virulence strain. *Molecular Plant Pathology*, 2018, 19(7): 1652-1666. <https://doi.org/10.1111/mpp.12647>
 - 17. C. Yu, H. Chen, F. Tian, F. Yang, **X. Yuan**, C-H. Yang, and C. He*. A ten gene-containing

- genomic island determines flagellin glycosylation: implication for its regulatory role in motility and virulence of *Xanthomonas oryzae* pv. *oryzae*. *Molecular Plant Pathology*, 2018, 19.3: 579-592. <https://doi.org/10.1111/mpp.12543>
18. R. R. Patel, G. W. Sundin, C.-H. Yang, J. Wang, R. B. Huntley, **X. Yuan**, and Q. Zeng*. Exploration of using antisense peptide nucleic acid (PNA)-cell penetrating peptide (CPP) as a novel bactericide against fire blight pathogen *Erwinia amylovora*. *Frontiers in Microbiology*, 2017, 8: 687. <https://doi.org/10.3389/fmicb.2017.00687>
19. S. Fan, F. Tian*, J. Li, W. Hutchins, H. Chen, F. Yang, **X. Yuan**, Z. Cui, C-H. Yang*, and C. He. Identification of phenolic compounds that suppress the virulence of *Xanthomonas oryzae* on rice via the type III secretion system. *Molecular Plant Pathology*, 2017, 18.4: 555-568. <https://doi.org/10.1111/mpp.12415>
20. C. Yu, N. Wang, M. Wu, F. Tian, H. Chen, F. Yang, **X. Yuan**, C-H. Yang, and C. He*. OxyR-regulated catalase CatB promotes the virulence in rice via detoxifying hydrogen peroxide in *Xanthomonas oryzae* pv. *oryzae*. *BMC Microbiology*, 2016; 16:269. <https://doi.org/10.1186/s12866-016-0887-0>
21. **X. Yuan**, D. Khokhani, X. Wu, F. Yang, G. Biener, B. J. Koestler, V. Raicu, C. He, C. M. Waters, G. W. Sundin, F. Tian*, and C-H. Yang*. Crosstalk between a regulatory small RNA, cyclic-di-GMP signaling and flagellar regulator FlhDC for virulence and bacterial behaviors. *Environmental Microbiology*, 2015, 17(11): 4745-4763. <https://doi.org/10.1111/1462-2920.13029>
22. Y. Li, W. Hutchins, X. Wu, C. Liang, C. Zhang, **X. Yuan**, D. Khokhani, X. Chen, Y. Che, Q. Wang*, and C-H. Yang*. Derivative of plant phenolic compound inhibits the type III secretion system of *Dickeya dadantii* via HrpX/HrpY two-component signal transduction and Rsm systems. *Molecular Plant Pathology*, 2015, 16(2): 150-163. <https://doi.org/10.1111/mpp.12168>

Review papers

23. R. R. Kharadi, J. K. Schacterle, **X. Yuan**, L. F. Castiblanco, J. Peng, S. M. Slack, Q. Zeng, and G. W. Sundin*. Genetic dissection of the *Erwinia amylovora* disease cycle. *Annual Review of Phytopathology*, 2021, 59:191-212. <https://doi.org/10.1146/annurev-phyto-020620-095540>
24. **X. Yuan**, M. T. Hulint, and G. W. Sundin*. Effectors, chaperones, and harpins of the Type III secretion system in the fire blight pathogen *Erwinia amylovora*: a review. *Journal of Plant Pathology*, 2021, 103:S25-S39. <https://doi.org/10.1007/s42161-020-00623-1>
25. **X. Yuan**, M. Yu, and C-H. Yang*. Innovation and application of the type III secretion system inhibitors in plant pathogenic bacteria. *Microorganisms*, 2020, 8(12), 1956. <https://doi.org/10.3390/microorganisms8121956>
26. G. W. Sundin*, L. F. Castiblanco, **X. Yuan**, Q. Zeng, and C-H. Yang. Bacterial disease management: challenges, experience, innovation and future prospects. *Molecular Plant Pathology*, 2016, 17.9: 1506-1518. <https://doi.org/10.1111/mpp.12436>

Seminars and presentations

Invited

- Sep 2023 "Priming apple immunity for disease control", ISU, Department of Horticulture Seminar Series, Ames, IA
- Apr 2023 "Entering a post-antibiotic era? New strategies for fire blight management", University of Tennessee, Knoxville, Entomology and Plant Pathology

	departmental seminar, Knoxville, TN
Mar 2023	“Tree response to Actigard/Apogee and other inducers”. Fire Blight Fruit School: New Research from our National Team, Traverse City, MI
Oct 2022	“Fire blight: host-microbe interactions from both sides”. ISU, Department of Plant Pathology, Entomology and Microbiology seminar, Ames, IA
Mar 2015	“Deciphering the multi-tier regulatory network that links the flagellar master regulator FlhDC to c-di-GMP signaling and the type III secretion system, an important virulence factor of pathogenic bacteria”. Milwaukee Microbiology Society, Milwaukee, WI

Conference and symposium

Dec 2023	Great Lakes EXPO. Annual meeting, Grand Rapids, MI
Nov 2023	NC140: improving economic and environmental sustainability in tree-fruit production through changes in rootstock use. Annual meeting, Holland, MI
Aug 2023	“Assessment of <i>Erwinia amylovora</i> nectarode colonization during apple flower infection”. Poster, K. Olive, X. Yuan , K. Gdanetz, and G. W. Sundin. American Phytopathological Society (APS) annual meeting, Denver, CO
Mar 2023	“A plasmid-dependent thiamine biosynthesis contributes to exopolysaccharide production in <i>Erwinia amylovora</i> ”. Oral presentation. Interdepartmental Microbiology Spring Retreat, Ames, IA
Aug 2022	“Analysis of the apple leaf transcriptome in response to plant defense regulators and biopesticides used for fire blight management”. Oral presentation, X. Yuan , K. Gdanetz, G. W. Sundin. APS annual meeting, Pittsburgh, PA
Aug 2021	“The ubiquitous plasmid pEA29 is an essential virulence factor in <i>Erwinia amylovora</i> ”. Oral virtual presentation, X. Yuan , G. C. McGhee, S. M. Slack, and G. W. Sundin. APS annual meeting, virtual
Apr 2021	“Functional exploration of the sliding motility driven by exopolysaccharides in <i>Erwinia amylovora</i> ”. Oral virtual presentation, Office for International Students and Scholars Scholar Showcase 2021, East Lansing, MI
Jun 2019	“Hfq controls bacterial virulence through linking c-di-GMP and two mechanistically distinct sRNAs”. Oral presentation, 2 nd International Symposium on Fire Blight of Rosaceous Plants, Traverse City, MI
Aug 2017	“c-di-GMP regulates pectate lyase activity through the H-NS- <i>rsmB</i> -RsmA pathway in the soft-rot bacterial pathogen <i>Dickeya dadantii</i> ”, Poster, APS annual meeting, San Antonio, TX

TEACHING

Course instruction

2023 Fall	Lecture, ISU Micro 551 Microbial Diversity and Phylogeny
2023 Spring	Guest Lecturer, MSU PLP 884: Prokaryotic Diseases of Plants

2011-2016 Teaching Assistant, UW-Milwaukee
Bio Sci 102: Elements of Biology
Bio Sci 580: Experimental Microbiology
Bio Sci 383: General Microbiology

SERVICE

Professional service

2023- Review Editor, *Frontiers in Microbiology*
Reviewer: Molecular Plant-Microbe Interactions, Molecular Plant Pathology,
 Phytopathology, Plant Disease, Phytofrontiers, European Journal of Plant
 Pathology, Plant Physiology, Plant Pathology, Phytopathology Research, FEMS
 Microbiology Letters, Frontiers in Plant Science, Microbiology Spectrum, Applied
 Microbiology and Biotechnology, Journal of Plant Pathology, Microbial
 Pathogenesis, Microorganisms, PLoS One, Physiological and Molecular Plant
 Pathology.

Membership in professional societies

The American Phytopathological Society
NC140: Tree Fruit Rootstock Improvement