

Ying-Yu Liao

Graduate Research Assistant
University of Florida
Plant Pathology Department
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Research Experience

- 1) Research projects are focused evaluating Novel management strategies.
Greenhouse and field experiment as well as basic biology techniques are the backbone of this project. Social communication skills are also required for farm crew cooperation and extension talks. The goal of this project is to develop novel and sustainable management strategy against bacterial spot disease of tomato.
- 2) The role of Type VI secretion system of bacterial spot of tomato, *Xanthomonas* spp.
*Molecular biology skills including cloning, RNA extraction, RTase PCR, qPCR etc. were required to conduct this project. This project focus on understanding how the type VI secretion system (T6SS) in the tomato pathogen *Xanthomonas perforans* (*Xp*) facilitates the development of bacterial spot disease. Understanding the virulence factor of *Xp* may help develop future targets for disease management.*

Education

MS, Plant Pathology December, 2016

University of Florida, USA

Committee: Mathews Paret (Advisor), Jeffery B. Jones (Co-Advisor), Josh Freeman

Thesis title: Antibacterial potential of metallic oxide nanomaterial against *Xanthomonas perforans* causing bacterial spot of tomato.

BSc, Agricultural Chemistry June, 2013

National Taiwan University, Taiwan

Adviser for undergraduate research: Nai-Chun Lin

Project title: Identification of genes involved in interbacterial competition ability and regulation of type VI secretion system (T6SS)-related genes using a random mutagenesis approach.

Professional and Teaching Experience

Guest lecturer May, 2019

Department of Agricultural Chemistry, National Taiwan University, Taiwan

Internship Fall, 2018

The UF/IFAS Plant Diagnostic Center, University of Florida, FL, USA

Communicating basic biological techniques and molecular biology with clients as an intern clinical technician.

Visiting Researcher Summer, 2017&18

Potnis laboratory, Department of Entomology and Plant Pathology, Auburn University, AL, USA

Teaching Assistant (General Plant Pathology, Lecturer: Dr. Spakes-Richter) Fall, 2017

Fully responsible for student lab lecture section, lab paper/exam and student project grading. Partially responsible of the class designs and material preparation for student lab.

Research Assistant July,2013-2014

Lin laboratory, Agricultural Chemistry, National Taiwan University, Taiwan

Responsible for cloning, gene expression experiment, and lab supply maintenance.

Peer Reviewed Publications

Liao, YY., Strayer-Scherer, A., White, J.C., Mukherjee, A., De La Torre-Roche, R., Ritchie, L., Colee, J., Vallad G. E., Freeman, J., Jones, J. B. and Paret, M. L. (2018). Nano-Magnesium oxide: A novel bactericide against copper-tolerant *Xanthomonas perforans* causing tomato bacterial spot. *Phytopathology*, 109(1), 52-62.

Strayer-Scherer, A., **Liao, YY.**, Young, M., Ritchie, L., Vallad, G. E., Santra, S., Freeman, J.H., Clark, D., Jones, J.B., and Paret, M. L. (2018) Advanced Copper Composites against Copper-Tolerant *Xanthomonas perforans* and Tomato Bacterial Spot. *Phytopathology*, 108(2), 196-205.

Abstracts & Non-Peer Reviewed Publications

Liao, YY., Strayer-Scherer, A., Huang, Z., Santra, S., White, J.C., De La Torre-Roche, R., Fan, Q., Da Silva, W.S., Vallad G. E., Freeman, J., Jones, J. B. and Paret, M. L. 2019. The efficacy of MgO bactericide against bacterial spot disease of tomato is particle size-dependent

Liao, YY., Strayer-Scherer, A., Huang, Z., Santra, S., White, J.C., Mukherjee, A., De La Torre-Roche, R., Ritchie, L., Colee, J., Vallad G.E., Freeman, J., Jones, J.B. and Paret, M.L. **2018**. A novel alternative to copper bactericide: Magnesium based nanomaterials for management of tomato bacterial spot. APS Annual Meeting.

Paret, M. L., Strayer-Scherer, A., **Liao, YY.**, Da Silva, W.S., Young, M., Ochoy, I., Averett D., Vallad, G.E., Santra S., Tan W., Jones J. B., Olson S.M., Freeman, J.H.. **2018**. Development and evaluation of nano-materials for management of copper-tolerant *Xanthomonas perforans* causing bacterial spot of tomato

Liao, YY., Strayer-Scherer, A., White, J.C., Mukherjee, A., De La Torre-Roche, R., Ritchie, L., Colee, J., Vallad G. E., Freeman, J., Jones, J. B. and Paret, M. L. **2017**. Evaluating Magnesium oxide nanoparticles as a novel bactericide for control of bacterial spot of tomato without accumulating in fruit. 32nd Annual Tomato Disease Workshop.

Strayer-Scherer, A., Hong, J., **Liao, YY.**, Young, M., Santra, S., Roskopf, E., Timilsina, S., Vallad, G. E., Jones, J. B., and Paret, M. L. **2017**. Effect of Advanced Copper Composites on the Soil Microbiome. 32nd Annual Tomato Disease Workshop.

YY. Liao, A. Strayer-Scherer, J. C. White, A. Mukherjee, M. Young, S. Santra, L. Ritchie, D. Clark, J. Freeman, J. B. Jones, and M. L. Paret. **2017**. Magnesium oxide nanomaterial, a novel bactericide for control of bacterial spot of tomato without accumulating in fruit. APS Annual Meeting.

Strayer-Scherer, A., Hong, J., **Liao, YY.**, Young, M., Santra, S., Roskopf, E., Timilsina, S., Vallad, G. E., Jones, J. B., and Paret, M. L. **2017**. Effect of Copper Nanomaterials on the Soil Microbiome. APS Annual Meeting.

YY. Liao, A. Strayer-Scherer¹, J. C. White, A. Mukherjee, M. Young, S. Santra, L. Ritchie, D. Clark, J. Freeman, J. B. Jones, and M. L. Paret. **2017**. Antibacterial potential of Magnesium oxide nanomaterial to manage bacterial spot disease of tomato. 15th Florida Phytopathological Society Biennial Meeting.

Strayer-Scherer, A., Hong, J., **Liao, YY.**, Young, M., Santra, S., Roskopf, E., Timilsina, S., Vallad, G. E., Jones, J. B., and Paret, M. L. **2017**. Effect of Copper Nanomaterials on the Soil Microbiome. 15th Florida Phytopathological Society Biennial Meeting.

- Liao, YY.**, Strayer, A., White, J., Mukherjee, A., Elmer, W., Ritchie, L., Clark, D., Freeman., J., Jones, J.B., and Paret, M. L. **2016**. Antibacterial potential of Magnesium oxide nanomaterial against *Xanthomonas perforans* causing bacterial spot of tomato. 31st Annual Tomato Disease Workshop.
- Strayer-Scherer, A., **Liao, YY.**, Young, M., Santra, S, Jones, J.B., and Paret, M. L. **2016**. Three Novel Copper-Based Nanomaterials for Management of Bacterial Spot of Tomato. 31st Annual Tomato Disease Workshop.
- Liao, YY.**, Strayer-Scherer, A., White, J., Mukherjee, A., Elmer, W., Ritchie, L., Clark, D., Freeman., J., Jones, J.B., and Paret, M. L. **2016**. Antibacterial potential of Magnesium oxide nanomaterial against *Xanthomonas perforans* causing bacterial spot of tomato. MISA Symposium.
- Strayer-Scherer, A., **Liao, YY.**, Young, M., Santra, S, Jones, J.B., and Paret, M. L. **2016**. Evaluation of Three Copper-Based Nanomaterials for Management of Bacterial Spot of Tomato. MISA Symposium.
- Liao, YY.**, Strayer, A., White, J., Mukherjee, A., Elmer, W., Ritchie, L., Clark, D., Freeman., J., Jones, J.B., and Paret, M. L. **2016**. Antibacterial potential of Magnesium oxide nanomaterial against *Xanthomonas perforans* causing bacterial spot of tomato. APS Annual Meeting.
- Strayer-Scherer, A., **Liao, YY.**, Ocoy, I., Tan, W., Young, M., Santra, S, Jones, J.B., and Paret, M. L. **2016**. Advanced Nanomaterials for Management of Bacterial Spot of Tomato. APS Annual Meeting.
- Liao, YY.**, Strayer, A., Ritchie, L., Clark, D., Freeman., J., Jones, J.B., and Paret, M. L. **2015**. Metallic Oxide Nanoparticles for the Management of Bacterial Spot of Tomato. Tomato Disease Workshop.
- Strayer, A., **Liao, YY.**, Ocoy, I., Tan, W., Young, M., Santra, S, Jones, J.B., and Paret, M. L. **2015**. Advanced Nanomaterials for Management of Bacterial Spot of Tomato. Tomato Disease Workshop.

Manuscripts in progress and timeline

- Liao, YY.**, Strayer-Scherer, A., White, J.C., Mukherjee, A., De La Torre-Roche, R., Ritchie, L., Colee, J., Vallad G. E., Freeman, J., Jones, J. B. and Paret, M. L. Particle-size dependent bactericidal activity of magnesium oxide against *Xanthomonas per-*

forans and bacterial spot of tomato. *Submitting to Scientific reports from Nature in August 2019.*

Strayer-Scherer, A., **Liao, YY.**, Timilsina, S., Abrahamian, P., Vallad, G. E., Paret, M. L., and Jones, J. B. Integrated Management of Bacterial Spot of Tomato in Florida. EDIS, University of Florida. *Submitted to EDIS in January 2019.*

Liao, YY., Strayer-Scherer, A., Santra, S., Jones, J. B. and Paret, M. L. Using Magnesium Oxide Nanomaterial as A Novel Tool for Bacterial Disease Management. *Submitted to Acta Horticulturae as meeting publication 2019.*

Presentations

Invited speaker

1. University of Florida Plant Pathology Department seminar 2019
Title: Antibacterial potential of nano magnesium, and role of type VI secretion system of *Xanthomonas perforans*
2. Mid Atlantic Fruit and Vegetable Conference 2018
Title: Magnesium based nanomaterials for management of bacterial spot of tomato
Extension talk for stake holders, academic, and industrial audience. About 2,200 people from throughout the mid-Atlantic region attended the meeting.

Oral Presentation

1. VI International Symposium on Tomato Diseases 2019
Title: Using magnesium nanomaterial as novel alternative to plant disease management
2. American Phytopathological Society Southern Division Annual meeting 2019
Title: A novel alternative to copper bactericide: Magnesium nano-materials for management of bacterial spot disease of tomato.
3. Tomato Disease Workshop 2017
Title: Evaluating Magnesium oxide nanoparticles as a novel bactericide for control of bacterial spot of tomato without accumulating in fruit
4. Florida Phytopathological Society Biennial Meeting 2017
Title: Antibacterial potential of Magnesium oxide nanomaterials to manage bacterial spot disease of tomato

5. University of Florida Plant Pathology Department seminar 2016
Title: Antibacterial potential of Magnesium oxide nanomaterial against *Xanthomonas perforans* causing bacterial spot of tomato
6. Tomato Disease Workshop 2016
Title: Antibacterial potential of Magnesium oxide nanomaterial against *Xanthomonas perforans*, causal agent of bacterial spot of tomato
7. Tomato Disease Workshop 2015
Title: Metallic oxide nano-particles for management of bacterial spot of tomato

Poster presentation

1. American Phytopathological Society Annual meeting 2019
Title: The efficacy of MgO bactericide against bacterial spot disease of tomato is particle size-dependent
2. 11th International Congress of Plant Pathology meeting 2018
Title: A novel alternative to copper bactericide: Magnesium based nanomaterials for management of tomato bacterial spot.
3. American Phytopathological Society Annual meeting 2017
Title: Magnesium oxide nanomaterial, a novel bactericide for control of bacterial spot of tomato without accumulating in fruit
4. MISA Inaugural Symposium 2016
Title: Antibacterial potential of Magnesium oxide nanomaterial against *Xanthomonas perforans*, causal agent of bacterial spot of tomato
5. American Phytopathological Society Annual meeting 2016
Title: Antibacterial potential of Magnesium oxide nanomaterial against *Xanthomonas perforans* causing bacterial spot of tomato
6. 11th NTU-Japan International symposium 2013
Title: Identification of genes involved in interbacterial competition ability and regulation of type VI secretion system (T6SS)-related genes using a random mutagenesis approach.

Awards

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| 1. Milt and Nancy Schroth Student Travel Award \$500 | July, 2019 |
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2. UF Plant Pathology Department and Plant Pathology Graduate Student Organization Student Travel Award (\$200) July, 2019
3. ISHS Young Mind Award for **best oral presentation** at the VI International Symposium on Tomato Diseases May, 2019
4. Graduate Student Council Travel Grant (\$350) March, 2019
5. APS Southern Division Student Travel Award (\$400) February, 2019
6. UF Plant Pathology Department and Plant Pathology Graduate Student Organization Student Travel Award (\$500) July, 2018
7. Government Scholarship to Study Abroad (\$32,000/2 years) June, 2018-present
8. Academic Achievement Award June, 2015
9. Outstanding Award in Service Learning Education January, 2011

Memberships, Associations, and Positions

Member of International Society for Horticultural Science (ISHS) December 2018-present

Treasurer for Plant Pathology Graduate Student Organization August, 2018-19

In charge of fund application to student government, Graduate Student Council, and Plant Pathology department.

Member of American Phytopathological Society (APS) August, 2015-present

(Member of bacteriology, graduate student, IPM, and extension committees)

Member of APS Southern division December, 2018-present

Member of Plant Pathology Graduate Student Organization August, 2014-present

(Professional development and fundraiser committee)

Event General Coordinator of National Taiwan University Agricultural Chemistry

Student Association August, 2012-13

Director of Planning of NTU Art Festival – Movie division August, 2010-11

Selected student for Academia Sinica biological programs for high school students.

August, 2006-07

Grants

Assisted in the preparation of two funded grants:

1. Limiting losses to tomato bacterial spot through knowledge of global pathogen diversity, improved seed health, and molecular breeding. USDA-SCRI ~\$3.1 million

- Field-testing of stabilized formulations of Magnesium oxide, a new bactericide discovered against copper-tolerant *Xanthomonas perforans*, the causal agent of bacterial spot disease of tomato. Florida Tomato Committee. \$44,800

Extension and Outreach Activities

- Frenchtown Urban Farm Florida First Detector Workshop February, 2019
The event is in cooperation with Doctor of Plant Medicine Program.
- Kate M. Smith Elementary School Science Club, Chipley, FL. October, 2016
In charge of lectures and demonstration of plant pathogens experiment. Also setup hands-on experiments for elementary school students.
- Corporate Field Day, North Florida Research and Education Center, University of Florida, Quincy, FL. July, 2016
In charge of lectures and demonstration of plant pathogens experiment for growers and extension agents.
- Plant Pathology Workshop June, 2016
North Florida Research and Education Center, University of Florida, Quincy, FL.
In charge of lectures and demonstration of plant pathogens experiment for high/middle school teachers and extension agents.

Professional Activities

- Organizer of “How to create life/work balance?” discussion panel April, 2019
Speakers: Dr. Carrie Harmon, Dr. Nicholas Dufault, Dr. Erica Goss, Dr. Matt Smith, and Dr. Mason Newark
- Organizer of Plant Pathology Graduate Student Organization Guest Speaker Event
Speaker: Dr. Neil McRoberts, UC-Davis, CA April, 2019
- Section coordinator of Florida Phytopathological Society Biennial Meeting May, 2017

Fundraising and Social Activities

- Organizer of PPGSO Spring Social Barbecue March, 2019
- Organizer of PPGSO “We Love Science event” February, 2019
- Organizer of PPGSO Plant Sale December, 2019
- Organizer of PPGSO Polo-shirt sale February, 2018

Languages

- Native: Mandarin, Taiwanese Hokkien, and Taiwanese Hakka

2. Full professional proficiency: English
3. Elementary proficiency: Japanese