Miaoying Tian

**College of Tropical Agriculture and Human Resources**

(Department of Plant and Environmental Protection Sciences)

FTE Distribution: 30% I; 70% R

**Education**

|  |  |  |
| --- | --- | --- |
| **Degree** | **University** | **Major** |
| Bachelors  | Agricultural University of Hebei | Plant Protection |
| Masters | Chinese Academy of Agricultural Sciences | Plant Pathology |
| PhD | The Ohio State University | Plant Pathology |

**Lifetime and Fellow Achievement Awards (peer nominated and endorsed national and International-important for those without accreditation that is peer nominated and endorsed, recognized)**

**Professional Appointments**

|  |  |  |
| --- | --- | --- |
| **Title** | **Employer** | **Dates Employed** |
| Associate ResearcherAssistant Researcher(Senior) Research AssociatePostdoctoral AssociatePostdoctoral Associate | University of Hawaii at ManoaUniversity of Hawaii at Manoa Boyce Thompson Institute Michigan State UniversityBoyce Thompson Institute | 08/01/201901/02/201404/200904/200604/2005 |

**Courses Taught**

Course Number and Title (credits)

* PEPS/TPSS 371 Genetics: Theory to Application, 3 credits (yearly, since 2014)
* PEPS/MBBE 652 Molecular Plant-Fungal Interactions, 3 credits (every 2 years, since 2015)
* PEPS 605 Biology of Plant Pathogens: Fungi and Nematodes (Fungi section, 2 credits) (yearly, since 2017)
* PEPS 600 Seminar in Plant Pathology (in rotation, 2014 and 2019)
* PEPS 499 and 699 Direct Research for Undergraduate and Graduate Students (all semesters)

**Publications (reverse chronological order)**

Books

Book Chapters

Tian M., Navet N., and Wu D. (2019)CRISPR/Cas9-mediated gene editing of the plant pathogenic oomycete *Phytophthora palmivora.* Book chapter in **CRISPR-Cas Methods. Springer Nature** (in press).

Conference Proceedings (Since 2014)

Note: Graduate students or researchers under my direct supervision are underlined.

Navet N., **Tian M.** (2019)Targeted mutagenesis of basil candidate susceptibility gene DMR1 using CRISPR/Cas9**.** (Abstr.) Phytopathology 109: S2.22. <https://doi.org/10.1094/PHYTO-109-10-S2.22>

Cai Z., Navet N., Uchida J., and **Tian M.** (2018)A host-specific RxLR effector of *Phytophthora palmivora* contributes to virulence on cacao. (Abstr.) Phytopathology 109: S2.58. https://doi.org/10.1094/PHYTO-108-12-S2.58

**Tian M.**, Gumtow R., Navet N., Wu D., Schornack S. and Uchida J. (2017) Dissecting the pathogenicity mechanisms of *Phytophthora palmivora*. (Abstr.) Phytopathology 107: S5.25

Wu D., Win J., Shao D., and **Tian M.** (2015) Dissecting the molecular basis of basil *Peronospora belbahrii* interactions. (Abstr.) Phytopathology 105(Suppl. 4): S4.150

Refereed Journal Publications

Notes: Corresponding author suggests the project leadership of the study and contribution to all aspects, including concept development, supervision, manuscript writing and editing; Graduate students or researchers under M. Tian’s direct supervision are underlined.

1. Pettongkhao S., Navet N., Schornack S., **Tian M.**\*, Churngchow N\* (2019). A secreted protein of 15 kDa plays an important role in *Phytophthora palmivora* development and pathogenicity. Scientific Reports (Accepted pending minor revision) (\***Corresponding author**)

2. Shao D. and **Tian M.\*** (2018) A qPCR approach to quantify the growth of basil downy mildew pathogen *Peronospora belbahrii* during infection. *Current Plant Biology*, 15:2-7. (\***Corresponding author**)

3. Gumtow R., Wu D., Uchida J. and **Tian M.\*** (2018) A *Phytophthora palmivora* extracellular cystatin-like protease inhibitor targets papain to contribute to virulence on papaya. *Molecular Plant-Microbe Interactions*, 31(3):363-373. (\***Corresponding author**)(Cover page article)

4. Mishra S., Wang K. H., Sipes B. S. and **Tian M.** (2018) Induction of host-plant resistance in cucumber by vermicompost tea against root-knot nematode. *Nematropica*, 48(2):164-171.

5. Ekchaweng K., Evangelisti E., Schornack S., **Tian M.\*** and Churngchow N\*. (2017) [The plant defense and pathogen counterdefense mediated by *Hevea brasiliensis* serine protease HbSPA and *Phytophthora palmivora* extracellular protease inhibitor PpEPI10.](https://www.ncbi.nlm.nih.gov/pubmed/28459807) *PLoS One*, 12(5):e0175795. (\***Corresponding author**)

6. Mishra S., Wang K. H., Sipes B. S. and **Tian M.** (2017) Suppression of root-knot nematode by vermicompost tea prepared from different curing ages of vermicompost. *Plant Disease*, 101(5): 734-737.

7. Wu D., Navet N., Liu Y., Uchida J. and **Tian M**\*. (2016) Establishment of a simple and efficient *Agrobacterium*-mediated transformation system for *Phytophthora palmivora. BMC Microbiology,* 16:204**(\*Corresponding author)**

8. Khunjan U., Ekchaweng K., Panrat T., **Tian M.**, and Churngchow N. (2016) Molecular cloning of HbPR-1 gene from rubber tree, expression of HbPR-1 gene in *Nicotiana benthamiana* and its inhibition of *Phytophthora palmivora*. *PLoS One*, 11(6):e0157591.

9. Klessig D. F., **Tian M.,** and Choi H. W. (2016) Multiple targets of salicylic acid and its derivatives in plants and animals. *Front Immunol.* 7:206.

10. Choi H. W., Manohar M., Manosalva P., **Tian M.**, Moreau M., and Klessig D. F. (2016) Activation of plant innate immunity by extracellular high mobility group box 3 and its inhibition by salicylic acid. *PLoS Pathogens*, 12(3):e1005518.

11. Choi H. W.\*, **Tian M.**\*, Manohar M., Harraz M. M., Park S. W., Schroeder F. C., Snyder S. H., and Klessig D. F. (2015) Human GAPDH is a target of aspirin's primary metabolite salicylic acid and its derivatives. *PLoS One*, 10(11):e0143447. (**\*Co-first author**)

12. Choi H. W., **Tian M.**, Song F., Venereau E., Preti A., Park S. W., Hamilton K., Swapna G. V., Manohar M., Moreau M., Agresti A., Gorzanelli A., De Marchis F., Wang H., Antonyak M., Micikas R. J., Gentile D. R., Cerione R. A., Schroeder F. C., Montelione G. T., Bianchi M. E., and Klessig D. F. (2015) [Aspirin's active metabolite salicylic acid targets high mobility group box 1 to modulate inflammatory responses.](http://www.ncbi.nlm.nih.gov/pubmed/26101955) *Mol. Med.* 18(21):526-35.

13. Manohar M.\*, **Tian M.\***, Moreau M.\*, Park, S. W., Choi H. W., Fei Z., Friso G., Asif M., Manosalva P., von Dahl C. C., Shi K., Ma S., Dinesh-Kumar S. P., O’Doherty I., Schroeder F. C., van Wijk K. J. and Klessig D. F. (2015) Identification of multiple salicylic acid-binding proteins using two high throughout screens. *Frontiers in Plant Science*, 5:777. (**\*Co-first author**)

14. **Tian M.**,Sasvari Z., Gonzalez P., Friso G., Rowland E., Liu X., van Wijk K. J., Nagy P. D. and Klessig D. F. (2015) Salicylic acid inhibits the replication of Tomato Bushy Stunt Virus by directly targeting a host component in the replication complex. *Molecular Plant-Microbe Interactions*,28(4):379-86. (Highlighted in MPMI as *MPMI* Editor's Pick, April 2015)

15. [Liao Y](http://www.ncbi.nlm.nih.gov/pubmed?term=Liao%20Y%5BAuthor%5D&cauthor=true&cauthor_uid=25365924)**.**, [**Tian M**](http://www.ncbi.nlm.nih.gov/pubmed?term=Tian%20M%5BAuthor%5D&cauthor=true&cauthor_uid=25365924)**.**, [Zhang H](http://www.ncbi.nlm.nih.gov/pubmed?term=Zhang%20H%5BAuthor%5D&cauthor=true&cauthor_uid=25365924)., [Li X](http://www.ncbi.nlm.nih.gov/pubmed?term=Li%20X%5BAuthor%5D&cauthor=true&cauthor_uid=25365924)., [Wang Y](http://www.ncbi.nlm.nih.gov/pubmed?term=Wang%20Y%5BAuthor%5D&cauthor=true&cauthor_uid=25365924)., [Xia X](http://www.ncbi.nlm.nih.gov/pubmed?term=Xia%20X%5BAuthor%5D&cauthor=true&cauthor_uid=25365924)., [Zhou J](http://www.ncbi.nlm.nih.gov/pubmed?term=Zhou%20J%5BAuthor%5D&cauthor=true&cauthor_uid=25365924)., [Zhou Y](http://www.ncbi.nlm.nih.gov/pubmed?term=Zhou%20Y%5BAuthor%5D&cauthor=true&cauthor_uid=25365924)., [Yu J](http://www.ncbi.nlm.nih.gov/pubmed?term=Yu%20J%5BAuthor%5D&cauthor=true&cauthor_uid=25365924)., [Shi K](http://www.ncbi.nlm.nih.gov/pubmed?term=Shi%20K%5BAuthor%5D&cauthor=true&cauthor_uid=25365924)., and [Klessig D. F](http://www.ncbi.nlm.nih.gov/pubmed?term=Klessig%20DF%5BAuthor%5D&cauthor=true&cauthor_uid=25365924). (2015) Salicylic acid binding of mitochondrial alpha-ketoglutarate dehydrogenase E2 affects mitochondrial oxidative phosphorylation and electron transport chain components and plays a role in basal defense against tobacco mosaic virus in tomato. *New Phytologist*, 205(3):1296-1307.

16. Dong S., Stam R., Cano L. M., Song J., Sklenar J., Yoshida K., Bozkurt T. O., Oliva R., Liu Z., **Tian M.,** Win J., Banfield M. J., Jones A. M. E., van der Hoorn R. A. L. and Kamoun S. (2014) Effector specialization in a lineage of the Irish potato famine pathogen. *Science*, 343(6170):552-5.

17. [Moreau M](http://www.ncbi.nlm.nih.gov/pubmed?term=Moreau%20M%5BAuthor%5D&cauthor=true&cauthor_uid=24004003)., [Westlake T](http://www.ncbi.nlm.nih.gov/pubmed?term=Westlake%20T%5BAuthor%5D&cauthor=true&cauthor_uid=24004003)., [Zampogna G](http://www.ncbi.nlm.nih.gov/pubmed?term=Zampogna%20G%5BAuthor%5D&cauthor=true&cauthor_uid=24004003)., [Popescu G](http://www.ncbi.nlm.nih.gov/pubmed?term=Popescu%20G%5BAuthor%5D&cauthor=true&cauthor_uid=24004003)., [**Tian M**](http://www.ncbi.nlm.nih.gov/pubmed?term=Tian%20M%5BAuthor%5D&cauthor=true&cauthor_uid=24004003)., [Noutsos C](http://www.ncbi.nlm.nih.gov/pubmed?term=Noutsos%20C%5BAuthor%5D&cauthor=true&cauthor_uid=24004003)., and [Popescu S](http://www.ncbi.nlm.nih.gov/pubmed?term=Popescu%20S%5BAuthor%5D&cauthor=true&cauthor_uid=24004003). (2013) The Arabidopsis oligopeptidases TOP1 and TOP2 are salicylic acid targets that modulate SA-mediated signaling and the immune response. [*Plant Journal*,](http://www.ncbi.nlm.nih.gov/pubmed/24004003) 76(4):603-614.

18. **Tian M.,** von Dahl C. C., Liu P. P., Friso G., van Wijk K. J., and Klessig D. F. (2012) The combined use of photoaffinity labeling and surface plasmon resonance-based technology identifies multiple salicylic acid-binding proteins. *Plant Journal*, 72(6):1027-1038.

19. Porter K., Shimono M., **Tian M.**, and Day B. (2012) Arabidopsis actin-depolymerizing factor-4 links pathogen perception, defense activation and transcription to cytoskeletal dynamics.*PLoS Pathogens*, 8(11):e1003006.

20. Moreau M.\*, **Tian M.\***, and Klessig D. F. (2012)Salicylic acid binds NPR3 and NPR4 to regulate NPR1-dependent defense responses. *Cell Research*, 22(12):1631-1633. (**\*Co-first author**)

21. **Tian M.**, Win J., Savory E., Burkhardt A., Held M., Brandizzi F.,and Day B. (2011) 454 genome sequencing of *Pseudoperonospora cubensis* reveals effector proteins with a QXLR translocation motif. *Molecular Plant-Microbe Interactions*, 24(5):543-553. (Top 10 paper of MPMI in 2011)

22. Chinnapun D., **Tian M.**, Day B., and Churngchow N. (2009) Inhibition of a *Hevea brasilensis* protease by a Kazal-like serine protease inhibitor from *Phytophthora palmivora*. *Physiological and Molecular Plant Pathology*, 74:27-33.

23. **Tian M.**, Chaudhry F., Ruzicka D. R., Meagher R. B., Staiger C. J., and Day B. (2009) *Arabidopsis* actin depolymerizing factor AtADF4 mediates defense signal transduction triggered by the *Pseudomonas syringae* effector AvrPphB. *Plant Physiology*, 150(2):815-824.

24. Song J., Win J., **Tian M.**, Schornack S., Kaschani F., Ilyas M., van der Hoorn R., and Kamoun S. (2009) Apoplastic effectors secreted by two unrelated eukaryotic plant pathogens target the tomato defense protease Rcr3. *Proc. Natl. Acad. Sci. U.S.A*, 106(5):1654-1659.

25. Zhou F., Mosher S., **Tian M.**, Sassi G., Parker J., and Klessig D. F. (2008) The Arabidopsis gain-of-function mutant ssi4 requires RAR1 and SGT1b differently for defense activation and morphological alterations. *Molecular Plant-Microbe Interactions*, 21(1):40-49.

26. **Tian M**., Win J., Song J., van der Hoorn R., van der Knaap E., and Kamoun S. (2007) A *Phytophthora infestans* cystatin-like protein targets a novel tomato papain-like apoplastic protease. *Plant Physiology*, 143:364-377.

27. **Tian M**., and Day B. (2006) Domain switching and host recognition. *Molecular Microbiology*, 61(5):1091-1093.

28. **Tian M.** andKamoun S. **(**2005) A two disulfide bridge Kazal domain from *Phytophthora* exhibits stable inhibitory activity against serine proteases of the subtilisin family. *BMC Biochemistry*, 6:15.

29. Torto-Alalibo T., **Tian M.,** Gajendran K., Waugh M. E., van West P., andKamoun S. (2005) Expressed sequence tags from the oomycete fish pathogen *Saprolegnia parasitica* reveal putative virulence factors. *BMC Microbiology*, 5:46.

30. **Tian M.**, Benedetti B., and Kamoun S. (2005) A second Kazal-like protease inhibitor from *Phytophthora infestans* inhibits and interacts with the apoplastic pathogenesis-related protease P69B of tomato. *Plant Physiology*, 138:1785-1793.

31. **Tian M.**, Huitema E., da Cunha L., Torto T., and Kamoun S. (2004) A Kazal-like extracellular serine protease inhibitor from *Phytophthora infestans* targets the tomato pathogenesis-related protease P69B. *Journal of Biological Chemistry*, 279(25):26370-26377.

32. Huitema E., Bos J. I. B., **Tian M.**, Win J., Waugh M. E., and Kamoun S. (2004) Linking sequence to phenotype in *Phytophthora*-plant interactions. *Trends in Microbiology*, 12(4):193-200.

***Non-Referred Journal Articles***

33. **Tian M.**, and Kamoun S. (2017) pHIS-ATS: a protein expression vector modified from pFLAG-ATS for secreted expression of HIS-tagged fusion proteins. *Figshare*. <https://doi.org/10.6084/m9.figshare.5089903.v1>

Extension Publications

Creative Works (i.e., Extension Videos, Websites, Blogs, Creative Designs and Exhibitions, etc.)

Leadership Roles (Committees, Boards, Advisory, etc.)

*Committees in college and department:*

1. College of Tropical Agricultural and Human Resources (CTAHR) faculty senate (2015-2019)

b.PEPS faculty search committee (2015-2016, Environmental Microbiologist; 2017, Pollinator biologist; 2019, Entomologist)

c. Curriculum committee for the joint undergraduate program of PEPS and TPSS (2016-2017)

d. Undergraduate student advisor for Invasive Species specialization of Tropical Agriculture and the Environment undergraduate program (2017-present)

*Conference session chair/moderator:*

a. “Pathogen Virulence and Effectors” session of American Phytopathological Society annual meeting at San Antonio, Texas (August 2017)

b. “Effectors” session of Oomycete Molecular Genetics Network annual meeting at Asilomar, California (March 2017)

c. “Oomycete Biology” session of Oomycete Molecular Genetics Network annual meeting at Asilomar, California (March 2015)

*Committee member of national and international scientific communities:*

1. Steering Committee of Oomycete Molecular Genetics Network (2018- )
2. Molecular and Cellular Phytopathology Committee the American Phytopathological Society (2014-2016)
3. Mycology Committee of the American Phytopathological Society (2014-2016).

**Graduate Students**

|  |  |  |
| --- | --- | --- |
| Category | Current Number of Students | Number Graduated (Career) |
| *Chair* of Master’s Committees | 1 | 2 |
| *Chair* of PhD Committees | 1 |  |
| Member of Master’s Committees | 1 | 3 |
| Member of PhD Committees | 1 | 2 |

**Grant Support**

**Tian M.** 2019-2024, Pathogenicity mechanisms and control of economically important plant pathogenic oomycetes, NIFA HATCH project, project no HAW09049-H.

Sipes B., Wang K.H., **Tian M.,** Marahatta S. SEED IDEAS, University of Hawaii at Manoa, $2000.

**Tian M.** 2019. Fulbright Outreach Lecturing Fund. $2,600.

Wang K.H., **Tian M.**, Sugano J., Uyeda J. and Silva J. 2018-2021. Soil health friendly biofumigation using brown mustard and oil radish cover crops for soil-borne disease management. USDA NRCS PIA CIG, $74,995.

**Tian M.** 2017-2019. Develop sweet basil varieties resistant to downy mildew via CRISPR/Cas9-mediated gene editing, subaward under USDA-ARS SPECIFIC COOPERATIVE AGREEMENT: Control of Pests and Diseases and Adding Value to Specialty Crops, $80,000.

**Tian M.** 2015-2017. Identify the roles of putative effectors in pathogenicity of basil downy mildew pathogen *Peronospora belbahrii*, subaward under USDA-ARS SPECIFIC COOPERATIVE AGREEMENT: Control of Pests and Diseases and Adding Value to Specialty Crops, $80,000.

**Tian M.** 2016-2017. Establish a transient gene silencing system to identify genes that play key roles in basil downy mildew disease development. Intrexon, $104,138.

**Tian M.** 2014, 2018. Bench fee from The Royal Golden Jubilee Ph.D. Program and the Strategic Scholarships Fellowships Frontier Research Networks, Thailand, $9,000.

**Tian M.** 2018. Fulbright Outreach Lecturing Fund. $1,900.

**Tian M.**, Uchida J., Sugano J. and Uyeda J. 2014-2015. Developing short-term and long-term measures to manage basil downy mildew, CTAHR Internal Research grant, $10,000.

**Tian M.** 2014-2019, Dissecting pathogenesis mechanisms and developing novel strategies to control basil downy mildew, NIFA Hatch project, project no HAW09028-H.

**Presentations at Conferences (Since 2014)**

Note: Graduate students or researchers under my direct supervision are underlined.

Title: Targeted mutagenesis of basil candidate susceptibility gene DMR1 using CRISPR/Cas9**.**

Authors (put an asterisk on the presenter): Navet N.\*, **Tian M.**

Name of Conference: American Phytopathological Society annual meeting

Location: Cleveland, Ohio

Date of Presentation: 08/06/2019

Title: Dissection of the pathogenicity mechanisms of *Phytophthora palmivora* using CRISPR/Cas9 gene editing

Authors (put an asterisk on the presenter): **Tian M.\***

Name of Conference: The Third HOKU (Honolulu Office of Kobe University) Symposium

Location: Honolulu, Hawaii

Date of Presentation: 11/16/2018

Title: A host-specific RxLR effector of *Phytophthora palmivora* contributes to virulence on cacao

Authors (put an asterisk on the presenter): Cai Z., Navet N., Uchida J., and **Tian M.\***

Name of Conference: Joint Meeting of the American Phytopathological Society Pacific Division and Conference on Soil-borne Plant Pathogens

Location: Portland, Oregon

Date of Presentation: 06/27/2018

Title: Dissecting the pathogenicity mechanisms of *Phytophthora palmivora*.

Authors (put an asterisk on the presenter): **Tian M.\***, Gumtow R., Navet N., Wu D., Schornack S. and Uchida J.

Name of Conference: American Phytopathological Society annual meeting

Location: San Antonio, Texas

Date of Presentation: 08/08/2017

Title: A *Phytophthora palmivora* cystatin-like protease inhibitor targets papain to contribute to virulence on papaya.

Authors (put an asterisk on the presenter): Gumtow R., Wu D., Schornack S., Uchida J., and **Tian M.\***

Name of Conference: Oomycete Molecular Genetics Network annual meeting

Location: Asilomar, California

Date of Presentation: 03/12/2017

Title: Functional characterization of a cytoplasmic effector gene highly conservedin plant pathogenic oomycetes.

Authors (put an asterisk on the presenter): Navet N\*., Wu D., Shao D. and **Tian M.**

Name of Conference: Oomycete Molecular Genetics Network annual meeting

Location: Asilomar, California

Date of Presentation: 03/12/2017

Title: Vermicompost tea mediated host plant resistance against root-knot nematodes, *Meloidogyne spp*.

Authors (put an asterisk on the presenter): Mishra S.\*, Sipes B. S., **Tian M.** and Wang K. H.

Name of Conference: Society of Namatologists / The Organization of Nematologists of Tropical America annual meeting

Location: Montreal, Canada

Date of Presentation: 2016

Title: Functional characterization of putative effector genes of basil downy mildew pathogen *Peronospora belbahrii*

Authors (put an asterisk on the presenter): Shao D.\* and **Tian M.**

Name of Conference: International Society for Molecular Plant-Microbe Interactions XVII Congress

Location: Portland, Oregon

Date of Presentation: 07/20/2016

Title: Establishment of a simple and efficient Agrobacterium-mediated transformation system for *Phytophthora palmivora*

Authors (put an asterisk on the presenter): Wu D., Navet N. and **Tian M.\***

Name of Conference: International Society for Molecular Plant-Microbe Interactions XVII Congress

Location: Portland, Oregon

Date of Presentation: 07/20/2016

Title: *De novo* assembly and analysis of transcriptome of *Peronospora belbahrii*

Authors (put an asterisk on the presenter): **Tian M.\***, Wu D., and Shao D.

Name of Conference: Oomycete Molecular Genetics Network annual meeting

Location: Asilomar, California.

Date of Presentation: 03/16/2015

Title: Functional characterization of putative extracellular cystatins in *Phytophthora palmivora* pathogenicity on papaya.

Authors (put an asterisk on the presenter): Gumtow R.\*, Dragich M., Uchida J., Schornack S., **Tian M.**

Name of Conference: Oomycete Molecular Genetics Network annual meeting

Location: Asilomar, California

Date of Presentation: 03/16/2015

Title: Dissecting the molecular basis of basil *Peronospora belbahrii* interactions.

Authors (put an asterisk on the presenter): Wu D., Win J., Shao D., and **Tian M.\***

Name of Conference: American Phytopathological Society annual meeting

Location: Pasadena, California

Date of Presentation: 08/02/2015

Title: Toward understanding the molecular basis of basil‐*Peronospora belbahrii* interactions

Authors (put an asterisk on the presenter): **Tian M.\***

Name of Conference: CTAHR/Tokyo University of Agriculture and Technology (TUAT) meeting

Location: Honolulu, HI.

Date of Presentation: 05/15/2015