

Toi Ketehouli, Ph.D.

Address: 2550 Hull Road, Gainesville, FL 32611

Phone: +1352- 278-4238 - **Email:** toiketehouli25@gmail.com/ - [GoogleScholar](#): 500+ citations | h-index: 10

Education

Ph.D. in Plant Pathology, *Aug 2022 - May 2026*
University of Florida - Gainesville, FL, US

Ph.D. in Plant Nutrition and Proteomics, *Jul 2020 - Jul 2022*
University of Chinese Academy of Sciences - Beijing, China
 • Interrupted by Covid-19 restrictions

Master of Science (M.Sc) in Crop Biotechnology, *Sept 2016 - Jun 2020*
Jilin Agricultural University - Changchun, Jilin, China

Professional Bachelor of Science (~ Agricultural Engineer) in Agronomy and Crop Sciences, *Oct 2009 - Jul 2014*
University of Lomé - Lomé, Togo

Research Interests

Plant Abiotic and Biotic Stress Physiology
 Plant-Microbe Interactions
 Plant Molecular Biology

Technical Expertise

Plant Molecular and Functional Genomics

- Gene cloning and *Agrobacterium*-mediated transformation; generation of transgenic plants; qPCR/RT-qPCR; transcriptomic analysis; stress-response gene characterization and validation.

Microbiome and Microbial Ecology

- 16S rRNA sequencing, whole-genome sequencing, SynCom design, microbial community analysis, differential abundance modeling (DESeq2), and network analysis.

Bioinformatics and Quantitative Analysis

- R (phyloseq, DESeq2), UNIX, Nanopore sequencing workflows, statistical modeling of high-throughput data.

Plant Physiology & Phenotyping

- LI-COR 6800 gas exchange, nutrient profiling, abiotic/biotic stress, and biochemistry assays.

Work Experience

Graduate Research Assistant.

Aug 2022 - Present

University Of Florida - Gainesville, FL, US

- Examined the effects of antibiotic use in agriculture on the physiology, rhizosphere bacterial assemblages, and rhizosphere metabolite profiles in *Citrus reticulata* trees.
- Isolated and identified beneficial bacteria via whole-genome sequencing.
- Assembled and applied synthetic bacterial communities (SynComs) to improve plant health under both abiotic and biotic stress factors.
- Advised and mentored undergraduate students on navigating academic and professional goals with support and guidance.
- Contributed to writing funded grant proposals.

Founder and Consultant

Jul 2021 - present

TK AgriBiotech Consulting

- **Vision:** To revolutionize farming in my home country (Togo) by making advanced biotechnological innovations accessible and impactful at the fundamental level, driving a future where these innovations foster food security, ecological balance, and rural prosperity.
- **Mission:** To bridge cutting-edge biotechnology with practical crop solutions and empower farmers and agro-industries through science-driven insights, aiming to enhance crop productivity, sustainability, and resilience towards environmental challenges.
- Established and led an early-stage consulting firm specializing in sustainable crop production strategies, writing, and implementation of agricultural projects.
- Provided advisory services to researchers and growers on experimental design, plant health, and productivity improvement.

Scientific Editor - Remotely

Sep 2020 - Jul 2021

Nambou1 Biotech - Shenzhen, China

- Provided constructive and unbiased feedback to the authors.
- Detected and handled plagiarism, image manipulation, and data integrity issues.
- Improved clarity, structure, and grammar of manuscripts without altering scientific content.
- Collaborated with Nambou1 Biotech's general director to shape the company's scientific direction.

Graduate Research Assistant

Sep 2017 - Jun 2020

Jilin Agricultural University - Changchun, China

- Used advanced technologies, including molecular biology, genetic engineering, and biochemical assays, to Functionally Characterize a Soybean Calcineurin B-like Interacting Protein Kinase, *GmPKS4*, under Salt and Salt-alkali stress conditions.
- Designed and generated *pkS4* mutant using the floral dip method.
- Performed in vitro culture and regeneration of soybean explants using standardized tissue culture protocols.
- Conducted *Agrobacterium tumefaciens*-mediated transformation to introduce the *GmPKS4* gene into soybean to obtain a cultivar that confers tolerance to salinity.
- Performed phenotypical and physiological index analysis.
- Advised and mentored foreign undergraduate visiting students (in the Biotechnology Field) on navigating academic and professional goals with support and guidance.

Professional Bachelor Internship

Mar 2013 - Jul 2014

Agronomic Research Center of the University of Lomé (SEA-UL) - Lomé, Togo

- Designed and conducted research on soybean yield improvement using ecological/organic fertilizers (made by plants such as *Senna siamea*, *Terminalia catapa*, and animal manure) under drought stress conditions in agroforestry systems.
- Developed and applied organic fertilizer formulations and trained local farmers on sustainable fertilizer production and use.
- Wrote and presented the report to the public, including three committee members.

Teaching Experience**Teaching Assistant – Fungal Plant Pathogens – Instructor: Dr. Jeffrey Rollins**

Mar 2025 - Apr 2025

Department of Plant Pathology, University of Florida - Gainesville, FL

- Assisted the instructor in planning and delivering lab lessons to students, ensuring the curriculum was followed.
- Oversaw lab setup and organized teaching materials for hands-on sessions.
- Guided students through microscopy, culturing, and diagnostic techniques.
- Helped manage storage and maintain fungal isolates for future course use.

Teaching Assistant - Bacterial Plant Pathogens – Instructors: Drs. Jeff Jones and Frank White Jan 2025 - Mar 2025
Department of Plant Pathology, University of Florida - Gainesville, FL

- Prepared laboratory materials and protocols for lab sessions.
- Provided individualized support to students who required additional help understanding concepts or completing assignments.
- Developed positive relationships with students through individual interactions and recognition of accomplishments.
- Ensured safety protocols were always followed during lab sessions.

Peer-reviewed Publications

- **Ketehouli T**, Okpala EN, Wang CH, Foka IC, Aloryi KD, Batchey KK, Karikari B, Sossah FL, Wang G, An T. Harnessing Plant Ferritins for Iron Homeostasis and Crop Resilience: An Overview. *Plant Stress*. 2026 Apr 18:101384; (2026 **IF=6.9**, JCR **Q1**). **[First and corresponding author]**
- **Toi Ketehouli**, Frederick Leo Sossah, Roshni Panwala, Andrea Karina Suazo Tejada, Erica M Goss, Fernando H S Garcia, Gary E Vallad, Samuel J Martins; Secondary metabolites in plant-microbe interactions, *Journal of Applied Microbiology*, 2025; Ixaf124, <https://doi.org/10.1093/jambio/ixaf124> (2024 **IF=3.2**, JCR **Q2**)
- **Ketehouli Toi**, Goss Erica M., Batistel Fernanda, and Martins, Samuel J; The benefits and risks of antibiotics use in plant agriculture, 2025, *Plant Health Cases*, CABI, <https://doi.org/10.1079/planthealthcases.2025.0016>
- **Ketehouli, T.**, Goss, E. M., Ascunce, M. S., & Martins, S. J.; Metabolic and physiological effects of antibiotic-induced dysbiosis in citrus, 2024. *Ecotoxicology and Environmental Safety*, <https://doi.org/10.1016/j.ecoenv.2024.117325> (2024 **IF=6.1**, JCR **Q1**)
- **Ketehouli, T.**, Pasche, J., Buttrós, V. H., Goss, E. M., & Martins, S. J. (2024); The underground world of plant disease: Rhizosphere dysbiosis reduces above-ground plant resistance to bacterial leaf spot and alters plant transcriptome; *Environmental Microbiology*, <https://doi.org/10.1111/1462-2920.16676> (2024 **IF=4.0**, JCR **Q1**). **[Highlighted in two scientific journals: (1) *Advanced Science News* by Sukanya Charuchandra | Sep 3, 2024 "The threat beneath our feet: How soil microbes are losing the battle against crop disease"; and (2) *Trends in Plant Science* by Araujo, Ademir SF, et al. "Restoring unbalanced rhizosphere: microbiome transplants combatting leaf diseases, 2025" underscoring its novelty and relevance in rhizosphere dysbiosis to the broader scientific community]**
- Carther, K.F.I.; **Ketehouli, T.**; Ye, N.; Yang, Y.-H.; Wang, N.; Dong, Y.-Y.; Yao, N.; Liu, X.- M.; Liu, W.-C.; Li, X.-W.; Wang, F.-W.; Li, H.-Y.; Comprehensive Genomic Analysis and Expression Profiling of Diacylglycerol Kinase (DGK) Gene Family in Soybean (*Glycine max*) under Abiotic Stresses; *Int. J. Mol. Sci.* 2019, 20, 1361. <https://doi.org/10.3390/ijms20061361>(2019 **IF=4.556**, JCR **Q1**)
- **Ketehouli, T.**; Idrice Carther, K.F.; Noman, M.; Wang, F.-W.; Li, X.-W.; Li, H.-Y.; Adaptation of Plants to Salt Stress: Characterization of Na⁺ and K⁺ Transporters and Role of CBL Gene Family in Regulating Salt Stress Response; *Agronomy* 2019, 9, 687. <https://doi.org/10.3390/agronomy9110687> (2019 **IF=2.6**, JCR **Q1**)
- Kue Foka, I.C.; **Ketehouli, T.**; Zhou, Y.; Li, X.-W.; Wang, F.-W.; Li, H.; The Emerging Roles of Diacylglycerol Kinase (DGK) in Plant Stress Tolerance, Growth, and Development. *Agronomy* 2020, 10, 1375. <https://doi.org/10.3390/agronomy10091375> (2020 **IF=3.4**, JCR **Q1**)
- **Ketehouli T**, Zhou YG, Dai SY, et al.; A soybean calcineurin B-like protein-interacting protein kinase, *GmPKS4*, regulates plant responses to salt and alkali stresses. *Journal of Plant Physiology*. 2021 Jan; 256:153331. [DOI: 10.1016/j.jplph.2020.153331](https://doi.org/10.1016/j.jplph.2020.153331) (2020 **IF=4.1**, JCR **Q1**)
- Noman M, Aysha J, **Ketehouli T**, et al.; Calmodulin binding transcription activators: An interplay between calcium signalling and plant stress tolerance. *Journal of Plant Physiology*. 2021 Jan; 256:153327. [DOI: 10.1016/j.jplph.2020.153327](https://doi.org/10.1016/j.jplph.2020.153327) (2020 **IF=4.1**, JCR **Q1**)
- **Ketehouli, T.**, Quoc, V. H. N., Dong, J., Do, H., Li, X., & Wang, F.; Overview of the roles of calcium sensors in plants' response to osmotic stress signalling. *Functional Plant Biology*, 2022; 49(7), 589-599. <https://doi.org/10.1071/FP22012> (2022 **IF=2.7**, JCR **Q1**) **[First and Corresponding author]**

- Jameel A, **Ketehouli T.**, Wang Y, Wang F, Li X, Li H. Detection and validation of cis-regulatory motifs in osmotic stress-inducible synthetic gene switches via computational and experimental approaches. *Functional Plant Biology*. 2022 Aug 9;49(12):1043-54. <https://doi.org/10.1071/FP21314> (2022 **IF=2.7**, JCR **Q1**)
- Do, Hoaithuong, Yuqi Wang, Zhenhua Long, **Ketehouli T.**, Xiang Li, Zijun Zhao, and Mingtang Li. "A psychrotolerant Ni-resistant *Bacillus cereus* D2 induces carbonate precipitation of nickel at low temperature." *Ecotoxicology and Environmental Safety* 198 (2020): 110672. <https://doi.org/10.1016/j.ecoenv.2020.110672> (2020 **IF=6.3**, JCR **Q1**)
- Zhou, Y., Liu, W., Li, X., Sun, D., Xu, K., Feng, C., Kue Foka, I.C., **Ketehouli, T.**, Gao, H., Wang, N., and Dong, Y., 2020. Integration of sRNA, degradome, transcriptome analysis, and functional investigation reveals gma-miR398c negatively regulates drought tolerance via *GmCSDs* and *GmCCs* in transgenic *Arabidopsis* and soybean. *BMC Plant Biology*, 20, pp.1-19. <https://doi.org/10.1186/s12870-020-02370-y> (2020 **IF=4.3**, JCR **Q1**)

Publications under Review or Preparation

- **Toi Ketehouli**, Mason R. Trub, Erica M. Goss, and Samuel J. Martins: *Pseudomonas* spp.-based synthetic microbial community effects on nutrient uptake in citrus plants under induced dysbiosis (Under review in *Planta*; 2024 **IF=3.8**, JCR **Q1**).
- **Toi Ketehouli**, Erica M. Goss, Fabiano Jose Perina, and Samuel J. Patching the Leak or Rebuilding the Boat? Evaluating Targeted Probiotic Cyanobacteria and Microbiome Transplants to Counteract Antibiotic-Driven Rhizosphere Dysbiosis in Tomato under *Xanthomonas perforans* Pressure (Under review in *ISME Journal* 2024 **IF=10.0**, JCR **Q1**)
- Fabiano Jose Perina, Vanessa Thomas, **Toi Ketehouli**, Sameerika Mudiyansele, Erica Goss, and Samuel Martins, Antibiotics and copper drive compartment-specific dysbiosis and functional reprogramming in tomato microbiomes (**In preparation**).

Funding and Grant Activity

- Samuel Martins (PI), Erica Goss (Co-PI), and **Toi Ketehouli** (Contributed to experimental design, proposal development, and data analysis). Antibiotic Application and Its Effects on Plant Microbiome and Plant Health. Archer Early Career – UF/IFAS Research (2025-2026). \$50,000 (**Funded**)
- **Toi Ketehouli** (Principal investigator) and Samuel Martins (Co-PI). Proposed cyanobacteria-based SynCom strategy to mitigate bacterial leaf spot on tomato. Southern Graduate Student Grant – 2025 Sustainable Agriculture Research & Education. \$22,000 (**Submitted**)

Awards

- 2025 Florida Phytopathological Society – 2nd place poster competition
- 2024 UF CALS-IFAS Travel Grant
- 2024, APS Foundation Student Travel Grant
- 2022 Grinter Fellowship, University of Florida
- 2020 Alliance of International Science Organizations (ANSO) PhD Award for Young Talents, Chinese Academy of Sciences.
- 2020 Outstanding Master Student, College of Life Sciences, Jilin Agricultural University, China
- 2016 Chinese Government Scholarship Awardee: Fully funded scholarship for master's program

Certifications

- CIRTL Associate Certificate, University of Florida, September 2025
- Preparing Future Faculty, University of Florida – Fall 2024
- Project Management Skills for Leaders from Project Management Institute, December 2023
- Leadership Mindsets from Project Management Institute, January 2023
- Teaching English to Speakers of Other Languages from International TEFL and TESOL Training, July 2021

Professional Talks and Presentations

- **Toi Ketehouli**, Erica M. Goss, Samuel J. Martins: Exploring the Ecological Ramifications of Antibiotic Intervention in Citrus reticulata through Its Effects on Rhizosphere Bacterial Communities and Metabolites. Emerging Pathogens Institute Research Day 2024 (**Poster presentation**)
- **Toi Ketehouli**. Antibiotic application on citrus plants against citrus greening and potential effects on plant microbiome and health. Plants Get Sick Too, May 2023 (**Oral presentation**)
- **Toi Ketehouli**, Erica M Goss, Marina S Ascunce, Samuel J Martins: The Antibiotic Paradox in Citrus: Unveiling Links Between Dysbiosis, Plant Physiology, and Metabolism. American Phytopathological Society Annual Meeting (Plant Health 2024), July 27-30 (**Poster presentation**)
- **Toi Ketehouli**, Mason R. Trub, Erica M. Goss, Samuel J. Martins: Impact of synthetic Pseudomonas communities on citrus plant photosynthesis and rhizosphere microbial composition. 19th Biennial of the Florida Phytopathological Society Meeting, Fort Pierce, Florida, 2025 (**Poster presentation**)
- Samuel Martins, **Toi Ketehouli**, Sameerika Mudiyansele, and Fabiano Perina: Microbes Under Your Feet. Plants Get Sick Too, May 2025 (**Oral presentation**)
- **Toi Ketehouli**, Erica M. Goss, Samuel J. Martins: Decoding the Citrus Cipher: Unveiling the Links Between Antibiotic Use, Dysbiosis, Plant Physiology, and Metabolite Profiles. Plant Pathology Symposium, 2024, Gainesville, Florida (**Poster presentation**)
- **Toi Ketehouli**, Samuel Martins, and Sameerika Mudiyansele: Impact of Antibiotics on Plant Microbiome and Defense at Dr. Mary Jo Koroloy's Science for Life undergraduate seminar (**Guest lecture**), Sept 17th, 2024.

Professional Associations

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| • American Society of Plant Biology (ASPB) | <i>Apr 2025 - present</i> |
| • American Association for the Advancement of Science (AAAS) | <i>Mar 2024 - present</i> |
| • Florida Education Association (FEA) | <i>Nov 2023 - present</i> |
| • American Phytopathological Society (APS) | <i>Jan 2023 - present</i> |
| • Florida Phytopathological Society (FPS) | <i>Apr 2023 - present</i> |
| • College of Agronomy, University of Lomé Alumni Association (Alumni ESA-UL) | <i>Jul 2021 - present</i> |

Reviewer Activity

- Journal of Plant Interaction.
- Plant Physiology and Biochemistry.
- BMC Plant Biology
- International Journal of Molecular Sciences.
- Molecular Biology Reports
- Frontiers in Microbiology
- Plant Science

Outreach Events

- **Volunteer, Plants Get Sick Too**
University of Florida – Gainesville, FL | May 2023, 2024, and 2025
 - Helped in organizing this one-day workshop
 - Facilitated professional development workshops for middle and high school science teachers across Florida, focusing on plant pathology, microbiomes, and plant disease management.
- **Volunteer, Festival, and Open House** - Horticultural Sciences Teaching Gardens
University of Florida -Gainesville, FL | November 2023 and 2024
 - Represented the Plant Pathology Department by engaging prospective and current UF non-plant science major students with information about the Plant Science major, research opportunities, and career or graduate school pathways in plant-related sciences.
- **Volunteer, CALS Day of Service** - Rise Against Hunger Meal Packaging

University of Florida - Gainesville, FL | November 2024

- Participated in a campus-wide service initiative to support global hunger relief.
- Helped package over 25,000 meals in collaboration with Rise Against Hunger.
- Engaged with students, faculty, and staff to promote civic responsibility and community service.

Professional Trainings

- **Center for the Integration of Research, Teaching, and Learning (CIRTL) Associate Certificate**

University of Florida – Gainesville, FL | Apr – Sep 2025

National program focused on evidence-based teaching, inclusive excellence, and integration of research and instruction.

- Completed structured coursework and seminars in evidence-based pedagogy.
- Engaged in teaching development activities.
- Participated in inclusive teaching training.
- Met defined participation and reflection requirements.

- **Oxford nanopore bioinformatics lunch & learn seminar**

University of Florida – Gainesville, FL | July 2025

- Gained foundational knowledge of Oxford Nanopore sequencing principles, including raw data generation (fast5), basecalling (FASTQ), and downstream data formats (BAM, FASTA, variant files).
- Acquired practical insights into bioinformatics workflows for Nanopore data, including basecalling with Guppy/Bonito, sequence alignment with Minimap2, and variant analysis using Medaka and Nanopolish.

- **Computational genomics and epigenomics – Instructor Dr. Meixia Zhao**

University of Florida – Gainesville, FL | Jan - April 2025 | Course observer

- Proficient in basic UNIX command-line operations for bioinformatics workflows.
- Demonstrated mastery of fundamental concepts and methodologies in genomics and epigenomics.
- Skilled in evaluating the advantages and limitations of diverse computational approaches for genomic data analysis.
- Learned to apply and compare computational methods to analyze various high-throughput genomic datasets.

- **Preparing Future Faculty Program**

University of Florida – Gainesville, FL | Aug – Dec 2024

- Participated in a structured program focused on academic career preparation, including teaching pedagogy, curriculum design, mentoring, and faculty responsibilities.
- Engaged in workshops and seminars on effective teaching, research leadership, and academic service.
- Collaborated with faculty mentors to gain insight into tenure-track expectations and higher education practices.

- **Plant physiology workshop with LI-COR**

University of Florida – Gainesville, FL | June 2023

- Gained and mastered extensive knowledge about utilizing LI-COR 6800 (IRGAs) technology to evaluate plant photosynthesis indicators in specific scenarios.

Mentoring Experience

Undergraduate students (Supervised)

- **Mason Trub.** Undergraduate researcher in Martins' Lab, University of Florida. Supervised project: Impact of synthetic *Pseudomonas* communities on citrus plant photosynthesis and rhizosphere microbial composition (**Sep 2023 – Mar 2025**)
- **Kayleigh Lefley.** Undergraduate researcher in Martins' Lab, University of Florida. Supervised project: Effects of antibiotic use in agriculture on citrus plant physiology and rhizosphere bacterial assemblages (**Jan – Sep 2023**).
- **Carlo Sclavi.** Visiting undergraduate student from Università degli Studi di Camerino (UNICAM), Italy, at the Chinese Ministry of Education for the Bioreactor and Pharmaceutical Development Laboratory, Jilin Agricultural

University. Project supervised: Generation of transgenic soybean hairy roots overexpressing *GmPKS4* and analysis of stress tolerance (**Mar – Sep 2019**)

- **Leonardo Sclavi**. Visiting undergraduate student from Università degli Studi di Camerino (UNICAM), Italy, at the Chinese Ministry of Education for the Bioreactor and Pharmaceutical Development Laboratory, Jilin Agricultural University. Project supervised: Generation of transgenic soybean hairy roots overexpressing *GmPKS4* and analysis of stress tolerance (**Mar – Sep 2019**)

Additional Experience

English Language Tutor

Apr 2021 - Jun 2022

Self-employed – Hanoi, Vietnam

- Taught English as a second language to kids aged 4 to 16.
- Conducted one-on-one tutorials with struggling learners to further develop their skills.
- Employed creative approaches to motivate students to help them reach their full potential.

Counselor

Jan 2017 - Feb 2018

Association of Togolese Interns and Students in China (ASETOC) – Beijing, China

- Intervened in crises to de-escalate and resolve crises among members.
- Provided supportive and non-judgmental guidance during crisis intervention, promoting emotional regulation and problem-solving.

High School Science Teacher

Sep 2014 - Jul 2016

La Corniche Secondary School – Lomé, Togo

- Taught Mathematics and Biology courses to high school students.
- Organized the exams and handled the activity records
- Attended professional development seminars related to Science Education topics.
- Collaborated with other science subjects' teachers to develop interdisciplinary units of study.

Program Assistant

Sep 2014 - Dec 2014

Social Entrepreneurs International (SE INTL Togo) - Lomé, Togo

- Helped with the development and execution of program policies, procedures, services, and systems.
- Supported with setup, onsite coordination, and event planning.
- Trained farmers on new technologies, including producing and using organic fertilizers for crop production.
- Helped some householders in Lomé initiate backyard organic vegetable production for their own consumption.

Languages

- **French** Native
- **Chinese (Mandarin)** Advanced
- **English** Fluent
- **Vietnamese** Beginner

References

Upon request!