

CURRICULUM VITÆ

PERSONAL INFORMATION

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RESEARCH GOAL

I am a plant biologist and microbial ecologist interested in leveraging the rigor and power of modern biology to tackle real-life contemporary agronomic challenges. Practically, I rely on modern molecular biology, genetics, and data science alongside traditional microbiological techniques. Conceptually, I aim to understand mechanisms all the way up to whole systems, which requires a comprehensive synthesis of sciences that encompass different scales, and proportionately adopting their approaches and insights. My ultimate aim is to have mechanistic insights scale up to have practical applications in the field. In sum, my research focus is on processes and mechanisms that could be harnessed toward developing appropriate tools and practices for a sustainable intensification of agriculture.

TEACHING GOAL

Humans inherit the power of mind to contemplate the order of nature as a gift of being human. Education can expand this capacity and possibly lead people away from the contemporary meaning crisis. Given the diversity of students, it is imperative that education be about the relationships between specific human persons, and meet students at their diverse starting points with their unique obstacles. As a teacher I work hard to understand and meet students wherever they are starting and provide a reasonable path up the ladder of knowledge. Even if a student will not find a career in the subject, a university biology course will impact their view of the natural world and of life itself. My basic aim for most students is to nurture the natural sense of curiosity and build their scientific competency to understand the world around them to a basic depth. I wish to make the world of scientific research more familiar and accessible to students. Students, especially from diverse

backgrounds, often do not know how science is done and find it inaccessible especially as a career option. My educational path has been non-traditional. I can model what that path can look like. But because I know landscape firsthand, I can also motivate and guide them through the obstacles I can foresee beforehand, knowing how to specifically address any stage of their walk down that journey.

RESEARCH EXPERIENCE

2017–Present Research Assistant

Rice Microbiome

I have been working on plant-microbe and microbe-microbe interactions in the rice microbiome. My research focuses on examining functional traits conserved across the symbiotic continuum of pathogens, commensals, and mutualists and how they contribute to microbiome community assembly. I have developed synthetic communities (SynComs) using native rice paddy rhizobacteria and established these SynComs as models to examine several plant-microbe and microbe interactions in a semi-gnotobiotic *in planta* system. I have primarily relied on high-throughput amplicon sequencing and long-read whole genome sequencing, alongside bioinformatics, comparative genomics, and data science to explore the association of specific rhizobacterial traits and their influence on both the plant and the specific community of rhizobacteria.

UNIVERSITY OF CALIFORNIA, DAVIS
College of BIOLOGICAL SCIENCES
Department of PLANT BIOLOGY
Lab: Venkatesan SUNDARESAN

2015–2017 Research Assistant

*Root Nodule
Microbiome*

I primarily investigated symbiotic plant-microbe interactions in the *Medicago* root nodule microbiome. I used aseptic technique, microscopy, nucleotide extraction, PCR, and sequencing to examine the functional and phylogenetic diversity of soil, rhizosphere, and root nodule bacteria. I annotated and performed bioinformatic analyses of bacterial genomes, using curated databases such as JGI IMG-ER, KEGG, CAZY, KOG, and Pfam to make functional predictions for subsequent *in vitro* validation. I conducted data analysis and created graphics in R.

UNIVERSITY OF CALIFORNIA, LOS ANGELES
College of LIFE SCIENCES
Department of MOLECULAR, CELL, AND DEVELOPMENTAL BIOLOGY
Lab: Ann M. HIRSCH

TEACHING EXPERIENCE

- 2024 Associate Instructor
- PLB 111
Plant Physiology
- ROLE: Taught two 80-minute lecture periods per week, with a weekly office hour. Restructured the class, based on four years of experience as a TA. This included designing and implementing online gamified modules where students could practice questions and receive immediate feedback to steer them back in the right direction. Created all my presentations and midterms for the material I covered. Held extra review sessions and maintained rapid response to questions which students could submit online.
- CATALOGUE COURSE DESCRIPTION: Plant cell as a functional unit. The processes of absorption, movement, and utilization of water and minerals. Water loss, translocation, photosynthesis, respiration.
- UNIVERSITY OF CALIFORNIA, DAVIS
College of BIOLOGICAL SCIENCES
Department of PLANT BIOLOGY
- 2020–2023 Teaching Assistant
- PLB 111
Plant Physiology
- ROLE: Held weekly office hours, exam study sessions, and answered questions through email, Piazza, and Canvas. Graded midterms and finals. Provided technical assistance during lecture and handled all of the technological components of the course.
- CATALOGUE COURSE DESCRIPTION: (Same as above.)
- UNIVERSITY OF CALIFORNIA, DAVIS
College of BIOLOGICAL SCIENCES
Department of PLANT BIOLOGY
Lead Instructor: Steven THEG
- PLB 111D
Problems in Plant Physiology
- ROLE: Led three discussion sections per quarter, which were run independently from the main lecture. I combined lectures on the topics covered in PLB 111 with custom presentations, as well as custom approaches to teaching mathematical problem solving. I held office hours where I could further clarify outstanding questions from students and better personalize my teaching.
- CATALOGUE COURSE DESCRIPTION: Problems assigned weekly showing novel applications of principles described in PLB 111; prepare answers to be delivered orally during the class period.
- UNIVERSITY OF CALIFORNIA, DAVIS
College of BIOLOGICAL SCIENCES
Department of PLANT BIOLOGY

EDUCATION

(*proj. June 2025*) Doctorate of Philosophy
PhD UNIVERSITY OF CALIFORNIA, DAVIS
 College of BIOLOGICAL SCIENCES
 Department of PLANT BIOLOGY
 Advisor: Prof. Venkatesan SUNDARESAN

March 2017 Bachelors of Science
BSc UNIVERSITY OF CALIFORNIA, LOS ANGELES
 College of LIFE SCIENCES
 Department of MOLECULAR, CELL, AND DEVELOPMENTAL BIOLOGY

PUBLICATIONS

September 2024 Exploring and exploiting the rice
 phytobiome to tackle climate change challenges
Review Article KHATIBI, S. M. H., DIMAANO, N. G., **Veliz, E.**, SUNDARESAN, V. AND
 ALI, J
 Plant Communications 2024
 doi: 10.1016/j.xplc.2024.101078

February 2022 *Medicago* root nodule microbiomes: insights
 into a complex ecosystem with potential candidates for plant
 growth promotion
Research MARTÍNEZ-HIDALGO, P., HUMM, E. A., STILL, D. W., SHI, B.,
Publication PELLEGRINI, M., DE LA ROCA, G., **Veliz, E.**, MAYMON, M., BRU, P.,
 HUNTEMANN, M., CLUM, A., PALANIAPPAN, K., VARGHESE, N.,
 MUKHERJEE, S., REDDY, T. B. K., DAUM, C., IVANOVA, N. N., KYRPIDES,
 N. C., SHAPIRO, N., ELOE-FADROSH, E. A., AND HIRSCH, A. M.
 Plant Soil 2022, **471**, 507–526.
 doi:10.1007/s11104-021-05247-7

January 2021 Diverse *Rhizobium* strains isolated from root
 nodules of *Trifolium alexandrinum* in Egypt and symbiovars
Research YOUSEIF, S. H., ABD EL-MEGEED, F. H., MOHAMED, A. H., AGEEZ, A.,
Publication **Veliz, E.**, AND MARTÍNEZ-ROMERO, E.
 Systematic and Applied Microbiology 2021, **44(1)**, 126156.
 doi:10.1016/j.syapm.2020.126156

October 2019 Soil domestication by rice cultivation results
 in plant-soil feedback through shifts in soil microbiota
Research EDWARDS, J., SANTOS-MEDELÍN, C., NGUYEN, B., KILMER, J., LIECHTY,
Publication

Z., **Veliz, E.**, NI, J., PHILLIPS, G., AND SUNDARESAN, V.
 Genome Biology 2019, **20(1)**, 1–14.
 doi:10.1186/s13059-019-1825-x

August 2017 Chitinase-producing bacteria and their role
 in biocontrol.

Review Article

Veliz, E., MARTÍNEZ-HIDALGO, P., HIRSCH, A. M.
 AIMS Microbiology, 2017, **3(3)**: 689-705.
 doi: 10.3934/microbiol.2017.3.689

PRESENTATIONS

June 2023 Common elements of association:
 Plant-symbiotic traits involved in rice rhizobacterial
 community assembly.

Talk

Veliz, E., SUNDARESAN, V.
 UC Davis Plant Biology Tuesday Seminar

October 2016 *Micromonospora*, an endophytic actinomycete,
 synergistically stimulates the legume-rhizobial symbiosis in
 alfalfa (*Medicago sativa* L.)

Poster

Veliz, E., MARTÍNEZ-HIDALGO, P., HIRSCH, A. M.
 SACNAS National Conference

May 2016 Surveying the chitinolytic system of the
 actinomycete *Micromonospora* sp. L5

Poster

Veliz, E., MARTÍNEZ-HIDALGO, P., HIRSCH, A. M.
 UCLA Undergraduate Research Poster Day

February 2016 Examining the chitinolytic system in the
 genome of the Actinobacterium *Micromonospora* sp. L5

Poster

Veliz, E., MARTÍNEZ-HIDALGO, P., HIRSCH, A. M.
 CAMP (LSAMP) Statewide Symposium (Special Mention Award)

AWARDS

2023-2024

William G. and Kathleen Golden International Agricultural
 Fellowship

2022-2023

William G. and Kathleen Golden International Agricultural
 Fellowship

<i>2021-2022</i>	H. A. Lewin Family Fellowship
<i>2020</i>	Elsie Taylor Stocking Memorial Fellowship
<i>2017 - 2022</i>	National Science Foundation Graduate Research Fellowship (NSF GRFP)
<i>2017 - 2018</i>	UC Davis Dean's Distinguished Graduate Fellowship
<i>2016 - 2017</i>	MSD Scholars Fellowship (via NIH MBRS IMSD)
<i>2016</i>	CAMP (LSAMP) Statewide Symposium Honorable Mention
<i>2015 - 2016</i>	CARE Scholars Fellowship
<i>2015</i>	CARE Fellows Fellowship

COMPUTER SKILLS

<i>Basic</i>	bash, HTML, CSS, L ^A T _E X, vector graphics
<i>Intermediate</i>	R, MS Office

LANGUAGES

<i>Native</i>	ENGLISH · read, write, & speak
<i>Native</i>	SPANISH · read, write, & speak

October 29, 2024