

VitisGen students and Staff: Where are they now?

Two VitisGen projects educate new generation of geneticists and breeders.



Several recent publications have pointed to an increasing gap in the ability of universities to train the next generation of plant breeders and applied geneticists (Shelton & Tracy 2017, Morris et al 2006). While private investment in breeding has increased, public breeding programs are shrinking, and funding has been static over the past few decades. With university programs shrinking, who's going to train the next generation of plant breeders and geneticists?

The USDA-funded VitisGen and VitisGen2 projects have provided the training ground for several students and post-docs. We asked former students, post-doctoral associates and technical staff how their participation in *VitisGen* influenced their career development. Here are 23 responses we received.

Summary:

- 8 former post-docs, 7 former PhD students, and 7 Technical support staff responded
- 2 are assistant professors at Universities.
- 4 are researchers working internationally (Chile, Israel, the Netherlands, and Japan)
- 3 are research scientists at the USDA ARS.
- 3 are Cooperative Extension Associates working in outreach. One is a soil conservationist
- 1 is a private sector molecular scientist
- 2 are computer and robotics specialists in private industry.
- 3 continue to work in technical support positions.



Paola Barba

Graduate Student/PhD
Cornell University

Current Position: Researcher - Table Grape Breeder, Instituto de Investigaciones Agropecuarias, Santiago, Chile

Role in *VitisGen*: Implementation of GBS on grapevines, doing data analysis, phenotyping and genetic mapping

“Through VitisGen, I found that collaboration allows to reach higher goals. The project showed the richness of the grapevine research, a crop that I like to work with.”

Alanna Burhans

Technical/Support staff
USDA/ARS Parlier

Current Position: Soil Conservationist, Merced, CA

Role in *VitisGen*: In charge of plant propagation, care and field data/ sample collections.

“I learned all about table grapes and the types of pests and diseases they are susceptible to, as well as propagation techniques and how to produce crosses.”

“I learned a lot about time management, supervising interns and communication styles. These are all things I have used in my current job and am glad my form supervisor spent the time to help develop these skills. This project was also my entry into the agricultural realm.”



Beth Chang

Graduate Student/PhD
Cornell University

Current Position: Enology Extension Specialist, Virginia Tech, Winchester, VA

Role in VitisGen: Conducted research on grape flavor chemistry in wild and hybrid *Vitis*, as relates to the final wine quality.

“On a practical level, I learned that the relationship status between any grape cross would be, “it’s complicated”. In conducting selective breeding efforts in grapes, there needs to be a prioritization of desirable traits, because the introgression of certain attributes may result in the increase or introduction of less positive ones.”

“VitisGen introduced me to the field of accelerated plant breeding for more sustainable, high-quality specialty crops. In broad terms, I now have a lifelong passion for such efforts, and desire to continue supporting such projects. In my current role, I have used my knowledge of VitisGen’s aims, methods, and successes to promote similar efforts in the wine grape growing region that I currently serve. “



Li-Ling Chen

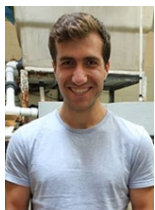
Technical/Support staff
Missouri State University

Current Position: Clinical Instructor; Missouri State University

Role in VitisGen: I am responsible for maintaining the mapping populations and provide the plant material for the genotyping and phenotyping centers as well as collecting local phenotyping data.

“Through this collaborative project, I have gained copious exposure to the latest genomics technologies including GBS and rhAmpSeq genotyping, and more importantly, I am able to pass them on to our local students.”

“VitisGen has really promoted our research into the genomics level and enhances our genotyping capacity.”



Konstantin Divilov

Graduate Student/PhD
Cornell University

Current Position: Research Associate, Oregon State University

Role in VitisGen: I was a PhD student studying resistance to downy mildew in grapes.

“I gained the knowledge of how to map loci associated with disease within the context of a breeding program. Working with VitisGen led me to continue working on disease resistance in my career.”



Connor Fortin

Undergraduate Summer Scholar/ Intern
Cornell University

Current Position: Senior Software Engineer
Advisor 360°, Boston, MA.

Role in VitisGen: I was a programmer/data analyst summer intern.

“This was my first experience developing software tools in a professional capacity. I learned the value of communication between the users (VitisGen team) and myself to ensure I understood specific requirements for my work, and they understood what I was capable of building. This has helped me in private industry where I need to collaborate with users, product managers, and others that do not have a background in software.”

“I learned that I really enjoyed creating tools to enable others, and decided to pursue software engineering as a career instead of bioinformatics.”



Jonathan Fresnedo Ramirez

Post-Doctoral Associate
Cornell University

Current Position: Assistant professor at The Ohio State University

“The opportunity given to me to be part of VitisGen helped me to reinforce my interest to develop a career in academia.”

“VitisGen provided to me an excellent platform and example of the type of nurturing environment that I attempt to provide to my students and collaborators in my enterprises.”



Fred Gouker

Post-Doctoral Associate
Cornell University

Current Position: Research Geneticist / USDA-ARS U.S. National Arboretum

Role in VitisGen: I was VitisGen2 Project Manager that coordinated research reporting, organized the annual project meeting, and co-administered annual evaluations with Industry Advisory Panel representatives.

“The most beneficial experience of being a part of the VitisGen project was gaining the knowledge and skills of working with a large interdisciplinary team. Working with VitisGen influenced where I wanted to work.”



Ugochukwu Ikeogu

Post-Doctoral Associate
Cornell University

Current Position: Fellow at Kansas State University

Role in VitisGen: Project management, High-throughput phenotyping, abdMarker-assisted breeding and traits improvement.

“I learned that effective collaborative research through combined expertise and resource-sharing is inevitable in addressing bigger and more complex scientific questions and maximizing research impact.”

“Apart from the impact of the participating principal investigators from various institutions, the composition as well as the contribution of the project Advisory Team was solid in the life and execution of the project.”

“VitisGen provided much-needed mentoring in my career development.”



Avi Karn

Post-Doctoral Associate
Cornell University

Current Position: Molecular Breeding Discovery Scientist at AgReliant Genetics LLC.

Role in VitisGen: Computational Biologist Post-Doc; collaborated with nation-wide grape breeders in VitisGen2 project to apply amplicon sequencing (AmpSeq/rhAmpSeq) marker data for accelerated marker-assisted selection in grape breeding.

“I developed and performed breeding data analysis pipelines in R, PERL, Linux, as well as managed breeding database in SQL/GitHub. Led high-throughput phenotype data collection for grape breeding programs.”

“VitisGen remendously improved my collaboration and networking skills with both scientific and non-scientific communities. Extraordinary group of people with big hearts and extraordinary vision.”

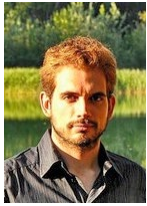
Hema Kasinathan

Technical/Support staff
Cornell University

Current Position: Associate Scientist at Invaio Sciences, Cambridge, MA.

Role in VitisGen: I did phenotyping mainly for Ledbetter population and other breeders' populations.

"I gained experience in handling large data sets and collaboration. It was a wonderful environment to work."



Dani Martinez

Post-Doctoral Associate
Cornell University

Current Position: Senior researcher in a small spanish tech company called Quercus Technologies.

Role in VitisGen: Development of a novel robot for rapid phenotyping of grapevine leaf disks and other related imaging technologies.

"I've gained very valuable experience on how to work in international and inter-disciplinary teams. Despite not currently having a job on this field, I've developed a preference on applying my skills on plant science and digital agriculture projects. I hope someday I can get back and focus on it."



Michelle Podolec

Technical/Support staff
Cornell University

Current Position: Executive Director, Cornell Cooperative Extension of Chemung County.

Role in VitisGen: Outreach and marketing support.

"I learned that breeders can quickly identify and introduce new grape varieties with improved disease resistance, climate specific adaptations, improved flavor, or other desired traits through technological advances in rapid gene sequencing."

"I gained confidence in helping to support and communicate the impact of a highly technical team."

What an awesome group! I enjoyed the curiosity, camaraderie, and support of working within such a wonderful team."



Noam Reshef

Post-Doctoral Associate
Cornell University

Current Position: I'm a researcher (PI) and leading a lab at the Agricultural Research Organization - Volcani Institute, Israel

Role in VitisGen: Identifying genetic loci, differentially expressed genes, and metabolic alterations associated with a differential accumulation of malic acid across *Vitis* species

"Vitisgen exposed me to the genetic diversity that exists within the Vitis genus, and the understanding that utilizing this diversity is vital for improving the future sustainability of viticulture."

"Thanks to the skills and knowledge I gained in Vitisgen, I've accepted a position as a grapevine researcher involved in grape breeding and genetics."

"Being part of Vitisgen has taught me a lot about how to successfully manage a large-scale multi-annual and multi-institutional project. I have a strong appreciation for the leaders of Vitisgen for organizing this complex project so well."



Surya Sapkota

Post-Doctoral Associate
Cornell University and USDA/ARS

Current Position: Plant Breeder, USDA ARS

Role in VitisGen: I was involved in population development, local phenotyping, and executing experiments in the powdery mildew phenotyping center including development of the high throughput phenotyping robot.

“The VitisGen project was an excellent platform for me to develop networking among breeders, extension workers, industry representatives and other colleagues. This project provided an insight on how cross discipline collaboration can accomplish great things.



Heather Scott

Technical/Support staff
Cornell University

Current Position: Technician IV, Cornell Food Science, supervisor Gavin Sacks

Role in VitisGen: I coordinated the efforts of the Fruit Chemistry analysis center, taking in grapes from breeders and organizing the processing and testing that ensued.

“I gained a greater appreciation for the complex nature of wine chemistry and the challenges involved in all aspects of our work, from the breeding side to the analysis of proteins and other tricky measurements.”

“VitisGen was made up of a supportive network of scientists! It was a delight to be part of such an encouraging, welcoming team.”



Soon Li Teh

Graduate Student/PhD
University of Minnesota

Current Position: Research assistant professor (pear rootstock breeder) at Washington State University.

Role in VitisGen: I developed linkage maps (for University of Minnesota grape breeding program), identified QTLs associated with powdery mildew resistance, and reported microsatellite markers that can be used for marker-assisted selection.

“The most invaluable gain was networking with great scientists from a wide range of expertise - breeders, quantitative geneticists, statisticians, biochemists, economists, extension specialist, etc. - who were willing to share their insights, collaborate and train students like me.

“I gained an appreciation of the importance of networking with scientists, even those from completely different areas of expertise, and being willing to ask 'stupid' questions.”



Anna Underhill

Technician
USDA/ARS Grape Genetics Research Unit

Current Position: Biological Science Laboratory Technician, USDA-ARS

Role in VitisGen: I provide technical support to graduate students, postdocs, and PIs to execute VitisGen research.

“I have greatly increased my knowledge and expertise in neural network-assisted phenotyping. I owe my current job to VitisGen, as a connection I made at an annual meeting led to my next position.”

“VitisGen has been a great opportunity to learn, share information, gain skills, and meet people in the grape research community. I've very much enjoyed working with all the PIs, postdocs, grad students, and industry members I've met over the course of the project.”



Janet van Zoeren

Technical/Support staff
Cornell University

Current Position: Integrated pest management specialist, Cornell Cooperative Extension, Lake Ontario Fruit Program

Role in VitisGen: Assist with all forms of extension and outreach, including website updates, newsletters, webinars, and other outreach.

“While compiling outreach materials I learned an incredible amount about genetics and breeding; in particular about the high tech genotyping and phenotyping that is taking place with VitisGen. I also learned a lot about how to communicate very tough, super “sciency” topics in a manner that is understandable to the general public, which continues to be critically important in my current job.”

“Getting to know so many researchers at Cornell and other institutions, as well as the skills I gained in being able to communicate complicated topics in a easy to understand manner, were both critical in my being a strong candidate for my current job and career.”



Hui-Ching Yang

Post-Doctoral Associate
USDA/ARS Parlier

Current Position: Research associate at USDA-ARS

Role in VitisGen: Conducting a project to study the effects of the grape powdery mildew fungicide sprays on non-target microbes.

“I learned how to conduct fungicide resistance tests on Botrytis and Alternaria species. It expanded my research network.”



Daniel Zendler

Visiting Researcher
Cornell University

Current Position: Post Doctoral Associate, Universiteit van Amsterdam, SILS, Molecular Plant Pathology

Role in VitisGen: I was a visiting researcher during VitisGen2 testing powdery mildew resistance of German grapevine breeding lines.

“I gained insight into the process of high-throughput phenotyping of powdery mildew resistance during my visit at the Cornell AgriTech campus. The insight into high-throughput phenotyping practices during my stay fueled my interest in the area of computational biology and the application of these methods.”



Azhar Uddin

Postdoctoral Research Associate
Trait Economics Team
Washington State University

Current Position: I am currently a Postdoctoral Research Associate at Institute for Research and Education to Advance Community Health (IREACH) at Washington State university.

Role in VitisGen: I was involved in survey design, data collection and analysis and writing manuscripts.

“I learned how to do collaborative research and gained knowledge on specific Econometric methods to estimate consumers' willingness to pay.”



Andrej Svyantek

Graduate Student
North Dakota State University

Current Position: Assistant Professor- Horticulture (Specialty Crop Breeding and Production);
Montana State University, Western Agricultural Research Center

Role in VitisGen: I maintained and phenotyped plant populations, while coordinating sample submission for the North Dakota State University Grape Germplasm Enhancement Project's VitisGen2 role as a collaborator; this allowed us to bring powdery mildew resistance alleles into our breeding program

“The culture of sharing (knowledge, materials, and gametes) among VitisGen2 team members impressed me most about the project.”