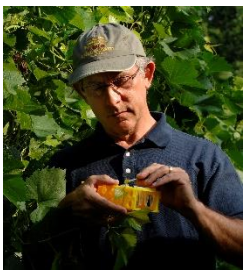
Mapping the Way to the Next Generation of Grapes

*Funded by the USDA-NIFA Specialty Crop Research Initiative Vitis*Gen2 *project (Award No. 2017- 51181-26829)*

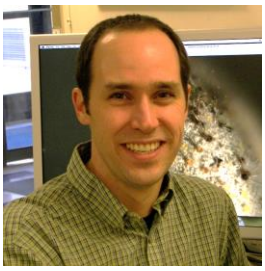
Project Personnel



Project Co-Director: Bruce Reisch

Professor, Cornell University, NYS Agricultural Experiment Station, 630 W. North St., Geneva, NY 14456, bruce.reisch@cornell.edu

Bruce is a Project Co-Director for *Vitis*Gen2. He leads the Breeding and Local Phenotyping Team, adopts and tests new *Vitis*Gen2 technology, and interacts with all team members.



Project Co-Director: Lance Cadle-Davidson

Research Plant Pathologist, USDA-ARS GGRU, 630 W. North St., Geneva, NY 14456, CadleDavidson@ars.usda.gov

Lance is a Project Co-Director. He leads the powdery mildew phenotyping team and serves on genetics and breeding teams. His role is to provide germplasm, strategies, protocols, and marker technology to make powdery mildew resistance breeding easy, efficient, and effective.

Project Manager: Fred Gouker

Postdoctoral Associate, Cornell University, NYS Agricultural Experiment Station, 630 W. North St., Geneva, NY 14456, feg23@cornell.edu

Fred is tasked with facilitating internal communications among all Co-Project Directors, Key Personnel, Collaborators, and Advisory Panel members. Additionally, Fred coordinates reporting, organizes the annual project meeting, co-administers annual evaluations with Industry Advisory Panel representatives, and works with the Extension and Outreach Team to translate research results into relevant outreach materials.

Grape Breeding and Local Phenotyping Team

Team Leaders: Bruce Reisch and Lance Cadle-Davidson (details above)

Chin-Feng Hwang

Professor, State Fruit Experiment Station, Missouri State University, 9740 Red Spring Road, Mountain Grove, MO 65711, ChinFengHwang@missouristate.edu

Chin-Feng maintains the vineyard of the Norton x Cabernet Sauvignon and Jaeger 70/Munson x Vignoles populations, manages pests and diseases of the vineyards, collects samples for further genotyping and phenotyping at Cornell, and participates in relevant extension and outreach efforts.

Anne Fennell **(also a member of the genetics team)**

Professor, South Dakota State University, 254b Northern Plains Biostress Laboratory, Brookings, SD 57007, anne.fennell@sdstate.edu

Craig Ledbetter

Research Geneticist, USDA-ARS CDPG, 9611 South Riverbend Ave., Parlier, CA 93648, Ledbetter@ars.usda.gov

Craig is a table grape and raisin breeder in central California. His focus is new variety development for fresh and dried fruit quality, as well as developing new cultivars with durable resistances to powdery mildew and Pierce's disease.

Rachel Naegele **(also a member of the fruit quality team)**

Research Horticulturist, USDA-ARS CDPG, 9611 South Riverbend Ave., Parlier, CA 93648, Naegele@ars.usda.gov

Rachel is a table/raisin grape horticulturalist with the USDA-ARS who joined the breeding and fruit quality teams in *Vitis*Gen2. In particular, her lab is working to develop a high-throughput imaging system to evaluate cluster architecture and identify molecular markers associated with cluster and fruit quality.

Harlene Hatterman-Valenti (collaborator)

Professor, North Dakota State University, Loftsgard Hall 470E, Fargo, ND 58108, H.Hatterman.Valenti@ndsu.edu

Harlene's objectives are to put into action the findings from the first *Vitis*Gen project. She and her team have created and planted a population of 98 descendants from 0934.01 for combining the Run1 and Ren2 genes into hardier backgrounds. They will start creating a second larger population for marker-assisted back-crossing at the seedling stage to pyramid the genes into more favorable backgrounds.

Andrew Walker (collaborator)

Professor, University California-Davis, 2152 RMI North Building, Davis, CA 95616, awalker@ucdavis.edu

Grape Genetics Team

Team Leader: Jason Londo (also a member of the breeding and phenotyping team)

Research Geneticist, USDA-ARS GGRU, 630 W. North St., Geneva, NY 14456, Jason.Londo@ars.usda.gov

Jason heads up the genetics team on *Vitis*Gen2. His role is to manage all the different aspects of genetics in this huge project. He oversees the use of amplicon sequencing to develop new markers, genome sequencing to discover new markers, gene expression to learn how traits are controlled. All of this work is to put more tools in the hands of grapevine breeders so they can reduce the cost time needed to release new varieties adapted to our changing world.

Dario Cantu

Associate Professor, University of California-Davis, 2146 RMI – North Building, Davis, CA 95616, dacantu@ucdavis.edu

Dario is Associate Professor and Louis P. Martini Endowed Chair in the Department of Viticulture and Enology at UC Davis. As member of the *Vitis*Gen2 Genetic team, Dario leads the genome assemblies and transcriptome analyses.

Peter Schweitzer
Senior Research Associate, Cornell University, 149 Biotechnology Bldg., Ithaca, NY 14853, Ppas48@cornell.edu

Peter is the director of the Genomics facility in the Institute of Biotechnology at Cornell University. His lab performs the genotyping/sequencing assays for the *Vitis*Gen2 project.

Qi Sun
Senior Research Associate, Cornell Bioinformatics Service Unit (CBSU), Cornell University, 618 Rhoades Hall, Ithaca, NY 14853, QiSun@cornell.edu

Qi's main responsibility is on the computational side, mostly in the development of haplotype references and low cost genotyping methodologies for marker discovery and breeding decisions. Qi's group also manages databases and cloud computing infrastructure for this project.

Powdery Mildew Team

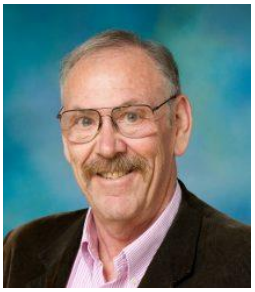
Team Leader: David Gadoury
Senior Research Associate, Cornell University, 630 W. North St., Geneva, NY 14456, dmg4@cornell.edu

David is a senior research associate at Cornell AgriTech in Geneva, and with Lance Cadle-Davidson, leads the powdery mildew phenotyping effort, providing expertise in host ontogenic resistance, pathogen biology, ecology, and epidemiology, as well as microscopy and digital imaging.

Mark Rea
Professor and Director, Lighting Research Center, Rensselaer Polytechnic Institute, Troy, New York 12180, ream@rpi.edu

The Lighting Research Center at Rensselaer Polytechnic Institute has been charged with developing an imaging system to automatically phenotype powdery mildew on grape leaf samples. Current methods use human visual assessment and are time consuming. Mark's goal is to develop an imaging system with artificial intelligence that can automatically analyze 1600 samples per day.

Trait Economics Team



Team Leader: Julian Alston
Distinguished Professor, University of California-Davis, 2157 Social Sciences & Humanities, Davis, CA 95616, julian@primal.ucdavis.edu

Julian serves as leader of the Trait Economics Team, and within the team's broader scope he will be focusing personally on the value of quality traits in table grapes—at least initially.

Rosa Karina Gallardo

Associate Professor, Washington State University, 2606 West Pioneer, Puyallup, WA 98371, karina_gallardo@wsu.edu

The overall objective of the trait economics objective is to investigate the market value to the supply chain of the improvement in the levels of grape genetic traits. R. Karina Gallardo will co-lead the estimation of values and preferences - from growers and consumers - for horticultural and quality traits for different varieties of grape products.

Bradley Rickard

Associate Professor, Cornell University, 450C Warren Hall, Ithaca, NY 14853, bjr83@cornell.edu

Brad is an agricultural economist from Cornell University that is part of the socio-economic team within *Vitis*Gen2. As part of this team, he will contribute towards an evaluation of grower, retailer, and consumer demand for specific traits in wine and table grapes in an effort to identify cultivars that have the capacity to generate the greatest economic returns to stakeholders.

Fruit Quality Team

Team Leader: Gavin Sacks

Associate Professor, Cornell University, 411 Tower Rd., Ithaca, NY 14853, gls9@cornell.edu

The Sacks lab oversees the Wine Grape Fruit Quality Phenotyping Center. The Center provides a centralized location for development and application of chemical analyses of grapes from breeding populations, with a particular focus on compounds responsible for undesirable properties of wild *Vitis* species.

Extension and Outreach Team

Team Leader: Timothy Martinson

Senior Extension Associate,
Cornell University, 630 W. North St., Geneva, NY 14456, tem2@cornell.edu

Tim is the outreach team leader for *Vitis*Gen2. He serves as senior extension associate with the statewide viticulture extension program, based at Cornell Agritech, also known as the New York State Agricultural Experiment Station, in Geneva, NY

Raquel Kallas
Viticulture Extension Support Specialist, Cornell University, 630 W. North St., Geneva, NY 14456, rfk58@cornell.edu

Raquel coordinates webinars, writes outreach materials, and manages the web presence of *Vitis*Gen2.

Matthew Clark (also a member of the breeding and phenotyping team)
Assistant Professor, University of ssMinnesota, 1970 Folwell Avenue, St. Paul, MN 55108, clark776@umn.edu

Matthew is the leader for the Grape Breeding and Enology Project at the University of Minnesota. For *Vitis*Gen, the Clark lab will be collecting data on traits that can be measured locally, including cluster compactness, berry color, disease and pest resistance, and fruit quality.

Michelle Moyer
Assistant Professor, Washington State University, 24106 N. Bunn Road, Prosser, WA 99350, michelle.moyer@wsu.edu

Michelle assist with development of extension materials (articles, factsheets, newsletters, webinars, workshops) related to how best adopt and use disease- resistant hybrid varieties in whole-farm pest management.

Keith Striegler (collaborator)
Grower Outreach Specialist, E.&J. Gallo Winery, 21280 N. Kennefick Rd., Acampo, CA 95220, keith.striegler@ejgallo.com

Keith's participation in the *Vitis*Gen2 Project will consist of assisting with publication of articles on the Project; publicizing Project webinars, publications, etc. to CA wine grape growers; distribution of Project publications to CA wine grape growers; and assist with scheduling, securing support, and logistics for Project meetings, field days, etc. in CA.

Postdocs

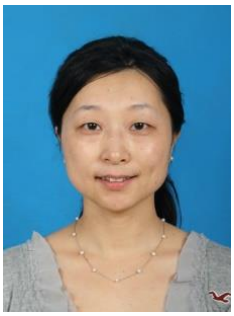
Avi Karn
Postdoctoral Associate, Cornell University, NYS Agricultural Experiment Station, 630 W. North St., Geneva, NY 14456, ak956@cornell.edu

Avinash (Avi) is a postdoctoral research scientist in The *Vitis*Gen2 project. The theme of his project is in the area of mark-assisted breeding on agro-economic and other important traits such as powdery mildew disease resistance, seedless-ness, flower sex, and fruit quality and composition.

Melanie Massonet

Postdoctoral Associate UC Davis, 2105 Robert Mondavi Institute-North Building, Davis, CA, 95616, mmassonnet@ucdavis.edu

Melanie is a postdoctoral associate in Dario Cantu's lab in the Department of Viticulture and Enology at UC Davis. Melanie is in charge of the genome-wide transcriptional analyses of the breeding populations for powdery mildew resistance gene stacking and wine grape quality.



Cheng Zhou

Postdoctoral Associate, Cornell University, Rhodes Hall, Ithaca, NY 14850, cz355@cornell.edu

Cheng is working on using bioinformatics tools to assist the grape breeding practice. For example: designing more efficient molecular markers using whole genome de novo assembly, pan-genome graph construction, etc. She is also performing an integrated data-mining of the genetic data that we have collected.

Surya Datta Sapkota

Postdoctoral Associate, Cornell University, 630 W North St. Geneva, NY 14456. A122 Barton Lab. sds322@cornell.edu

Surya utilizes his background and interest in plant sciences to set up, inoculate, and process grape leaf tissue samples for powdery mildew resistance assessment at phenotyping center. He works closely with experts in robotics, machine vision, optics, microscopy, and image analysis to facilitate high-throughput phenotyping.

Daniel Martinez Lacasa

Postdoctoral Associate, Cornell University, 630 W. North Street, Geneva, NY. A122 Barton Lab. dm676@cornell.edu

Dani is a postdoctoral associate in engineering and information technologies, with expertise in computer science, computer vision, and automation. He is involved in the development of *Vitis*Gen2 automatic phenotyping systems based on the integration of robot devices and computer vision procedures.