



## Welcome to a busy Winter Quarter! Here's what's new in the UC Davis V&E Family...

Check out all the latest news in our first quarterly e-newsletter. You will find information about our newest faculty, the latest in exciting research, our busy extension schedule on campus and around the state, and see what our current students are up to. Don't forget to "Like" us on Facebook and LinkedIn as well. Enjoy!



### Research spotlight: Dr. Dario Cantu studies the effects of a grapevine's environment

Dr. Cantu's research group uses "big data" genetic and chemical datasets to understand how grapevines interact with their environment and associated microorganisms, including, but not exclusively, those causing economically important diseases.

Current objectives of Dr. Cantu's research range from developing immunization protocols for protecting vines from Pierce's disease, developing early detection tools for trunk diseases, combining multiple genetic sources to achieve effective and durable genetic resistance to powdery mildew, and developing methods to mitigate the negative impact of disease on fruit quality.



Recent work from the Cantu lab explained how noble rot modifies grape flavor and aroma by reprogramming grape metabolism during ripening. Their work showed that noble rot induces metabolic processes in white grape berries normally seen only during the ripening of red-skinned grapes. This was a novel observation, because white berries are, in fact, developmental mutants that cannot activate several ripening pathways such as the synthesis of anthocyanins, the molecules that impart the red color in the skin of red grape berries.

The research also confirmed that the reprogramming of grape metabolism by *Botrytis* results in the accumulation of key aroma and flavor compounds that make sweet wines made from botrytized grapes so special.

## Meet our newest faculty members!

### V&E welcomes Assistant Professor Ron Runnebaum

In April Dr. Ron Runnebaum joined the Department of Viticulture and Enology from Siluria Technologies, a San Francisco-based start-up company that is developing catalyst technologies to convert natural gas to fuels and chemicals. He has a joint appointment in Chemical Engineering and Materials Science. After earning a BS in Chemical Engineering from the University of Notre Dame, Prof. Runnebaum led product innovations and cost optimization projects for the Pampers diapers and Charmin bath tissue businesses as a Research & Product Development Engineer at The Procter & Gamble Co in Cincinnati.



Deciding that he was interested in making wine, Prof. Runnebaum received his MS in Viticulture and Enology at UC Davis working with Prof. Hildegard Heymann on a project to understand the physical basis of mouthfeel. While at UC Davis, he was awarded a Chevalier Laureate grant from the Chevaliers du Tastevin Foundation to learn from Frédéric Mugnier of J. F. Mugnier in the village of Chambolle-Musigny, Burgundy, France. He has also

worked in the cellars of Hanzell Vineyards and Acacia Winery, in Sonoma and Napa, California, respectively.

Following his MS degree, Ron decided to continue on to pursue his Ph.D. in the Department of Chemical Engineering and Materials Science at UC Davis with Prof. Bruce Gates and Prof. David Block working on the catalytic conversion of biomass to value-added chemicals and fuels. Finally, prior to joining Siluria Technologies, Prof. Runnebaum completed a postdoctoral fellowship at the University of California, Berkeley, also in aspects of chemical catalysis, where his work was published in journals such as *Nature Nano*, *J. Am. Chem. Soc.*, and *ACS Catalysis*.

His research program aims to combine his interests in sustainable winemaking with his research background in nanomaterials, adsorption, heterogeneous catalysis, and reaction engineering. Winemaking-related projects include 1) Developing materials to capture CO<sub>2</sub> and volatile organic compounds, especially from fermentation; 2) Developing fundamental understanding for the production of chemicals from winery waste streams; and 3) Designing solid-state materials for the replacement of solution-based treatments, particularly those that could improve sustainability. In addition, Dr. Runnebaum continues to investigate fundamental structure-activity relationships in chemical adsorption and reaction by nanomaterials, including zeolites and supported organometallic clusters.

### V&E welcomes new CE Specialist in Viticulture

We're happy to announce Dr. Kaan Kurtural as the newest faculty member in the Department!

Dr. Kurtural completed his PhD at Southern Illinois University in Carbondale in Plant Biology in 2005. His PhD work explored the effects of crop load management on whole grapevine photosynthesis of wine grapes and developing spatial decision support systems on how best to convert broad acre agricultural land to production viticulture. After completing his PhD, Dr. Kurtural joined the faculty at University of Kentucky (2005-2008) as Viticulture Specialist in Cooperative Extension. His work there focused on crop load management of hybrid grapevines and its effect on primary bud cold hardiness. While at University of Kentucky, he also developed a vineyard site selection spatial decision support system where macro- and mesoclimate as well as soil properties of the lower Midwestern U.S. were modeled to aid Farm Advisors and prospective growers to assist with pre-planting decisions.

Prior to joining University of California Dr. Kurtural was appointed as the inaugural Bronco Wine Company Research Chair in Viticulture at the California State University Fresno. While there, Kurtural has done extensive research on mechanization of crop load management for optimizing grape yields and composition in the San Joaquin Valley of California. His more recent work focused on comparison of crop load management systems and differential regulated deficit irrigation on vineyards converted from traditional California sprawl trellises to other trellis and canopy-management systems in warm climates. Preliminary results suggest conversion to a single high-wire bilateral cordon mechanically pruned system can result in more efficient use of applied water with greater yields and similar berry skin phenolics. This study is providing important

information for California wine grape growers about how best to convert and manage canopies in light of declining resources such as labor and water. More recently he has also worked on effects of fruit zone light management and applied water amounts on plant secondary metabolites.

Kurtural will be actively involved in research under a recently awarded \$8 million, four-year, national grant from the U.S. Department of Agriculture Specialty Crop Research Initiative (SCRI) to develop and demonstrate tools and technologies for precision vineyard management. Kurtural within the SCRI grant, will lead the variable-rate vineyard management portion, where wine grapes, juice grapes and table grapes are the commodities of interest. Kurtural is also planning field trials to look at different rootstocks under different irrigation regimes to evaluate them for drought tolerance, water-use efficiency and rooting systems, working with UC Davis faculty members. One rootstock trial with red grape varieties is planned at the UC Kearney Agricultural Research and Extension Center in Fresno County, and a rootstock trial with white grape varieties will be conducted on the UC Davis campus. He also expects to work with other researchers on the epidemiology of red blotch virus spread, fertilizer use and efficiency and its effects on grape flavonoids, and training systems for mechanical production efficiency. Kurtural will help organize and take part in department extension meetings and seminars, as well.



## Kudos to our faculty on their latest honors and awards!



**Matthew Fidelibus** won the 2015 Extension Award from ASEV.

**Hildegard Heymann** won the Sensory and Consumer Division of the Institute of Food Technologists Sensory and Consumer Sciences Achievement Award, as well as the Elsevier Pangborn Sensory Science Symposium Established Researcher Award.



**Roger Boulton** was given the Lifetime Achievement Award from UC Davis Development and Alumni Relations and the UC Davis Foundation.

Emeritus **Jim Wolpert** won the Sylvan Wittwer Department of Horticulture Outstanding Alumni Speaker from Michigan State University.



**Sue Ebeler** was 2015's Erasmus Mundus Visiting Professor for the International Vintage Master Program in Cesena Italy, Piacenza Italy and Angers, France.

## UC Davis V&E Extension: Bringing the latest research and innovation to industry

### V&E On-the-Road in Santa Barbara

The Department of Viticulture and Enology Extension and Industry Relations team has been quite busy these last couple of months – most recent was a trip to Santa Maria on November 5.

We were "On the Road" at Presquile Winery in Santa Maria, where local grape growers and winemakers heard about Red Blotch and Pinot Leaf Curl from Rhonda Smith, learned about vine mealybug current research from Kent Daane, were introduced to Ron Runnebaum's proposed research and Andrew Walker talked about breeding PD-resistant grapevines. In addition, we introduced our new Viticulture Extension Specialist, Kaan Kurtural.

We were delighted that the weather was beautiful and 80 people attended! For more information on upcoming "On the Road" educational events, contact Industry Relations Manager Karen Block at [kblock@ucdavis.edu](mailto:kblock@ucdavis.edu).



### Partnering with Farm Advisors from across the state for a Grape Day at Davis



Research from all over California was reported at this symposium.

On December 2, 2015, the Department of Viticulture & Enology hosted the UC Grape Day at Davis, where many farm advisors and researchers from all over the state reported on their current research results, including the following topics: Raisin Grape Canopy Management, Frost Protection with Copper and Stylet Oil, Influence of Benchgraft and Training Strategies on Vineyard Development, State-of-the-Art Technology to Manage Vine Water Relations, New Winegrape Varieties for the San Joaquin Valley, Precision Viticulture from the Soil Perspective, and Evaluating the Potential of Hyperspectral Airborne Imaging in Management of Grapevine Leafroll Disease.

Turnout was great with approximately 185 people attending.

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## Don't miss our upcoming extension events!

January 27 & 28, 2016: We'll be at the **Unified Wine and Grape Symposium** in Sacramento. Visit us at booth #826, and RSVP to [kiblock@ucdavis.edu](mailto:kiblock@ucdavis.edu) for the 5th Annual Department of Viticulture and Enology Reception for alumni, students, faculty and friends on Wednesday, January 27 at 6:15pm. See below for more information.

February 19, 2016: Current Issues: **"Optimizing the Sustainability of Wine Processing"**. Register for Current Issues: **Optimizing the Sustainability of Wine Processing**.

March 2016: Wine Flavor 101 **"Blending for Style"**. Contact Kay Bogart for more information at [kibogart@ucdavis.edu](mailto:kibogart@ucdavis.edu).

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## Department of Viticulture and Enology Reception for Alumni, Students, Faculty and Friends

**Wednesday, January 27, 2016**  
**Hyatt Regency, Sacramento**  
**Regency Ballroom F (first floor)**  
**6:15 pm - 8 pm**

**Enjoy hors d'oeuvres, soft drinks, wine and friends (new and old). If you wish, bring a bottle of your wine to share!**

Sponsored by The Wine Spectator Scholarship Foundation

RSVP to [kiblock@ucdavis.edu](mailto:kiblock@ucdavis.edu)

## Want to name our newsletter?

Please send your creative ideas for newsletter names to our Industry Relations Manager, Karen Block, at [kiblock@ucdavis.edu](mailto:kiblock@ucdavis.edu) by March 1, 2016. The person contributing the winning entry will win some new UC Davis V&E swag that we will be debuting at Unified and, of course, a shout out in the spring newsletter!

## Spotlight on our students

### Student profile: Tiana Reed

*From pre-med to winemaking via Sonoma, Napa and Italy*

Tiana Reed's describes her life as a serendipitous journey. She grew up in the heart of Sonoma County's wine country, and she's worked in the wine industry for almost a decade. First she worked at Kenwood's Ledson Winery in the tasting room, hospitality, wine club, and administration department to help support her college tuition. She enjoyed learning the functions and roles of the administrative and public relations, and she was also highly intrigued by psychology and the sciences. She decided to pursue medical school. Just before transferring to UC Davis in 2011 to finish her bachelor's degree in Psychology, she realized how seriously she had fallen for the wine industry. She visited the undergraduate adviser in Viticulture & Enology to draft up an academic so she could see what a degree in that department would actually entail. She liked it, a lot -- it was full of science and all about wine, her greatest passions. But with so much time already invested in medicine Tiana really felt she needed to stay the course.



At the end of her second year at UC Davis, she was president of the pre-med SOMA campus club and preparing for MCATs. She had the medical school of her choice very interested in her, and was still working at a part time job with Vintage Wine Estates as bulk wine coordinator. Managing just shy of a million gallons of wine with ever-growing passion, she decided to switch her major to V&E. "It was one of the most difficult decisions I've ever had to make, but in hindsight it was the best decision I could have made!" Fortunately, there was overlap between the science requirements for both degrees so it wasn't too difficult. However she had accumulated too many units to double major so her only option was to apply for the master's program. With little production experience she figured the M.S. it plan was best, and knew it would work out. Her employer ended up offering Tiana her pick of their wineries for harvest. She hoped to intern in Tuscany, in the region of Chianti, at Antinori Tenuta Tignanello. Tiana found out she had received a scholarship and was ecstatic, although it was

impossible to get the student-work permits finished in a timely manner.

She missed the start of the Italian harvest, but because of Antinori's expansive world-wide presence with seven estates around the world, they invited her to work harvest in Napa at their Antica property before traveling to Italy for end-of-harvest vinification and barrel work for two months. Antica sits on top of Atlas Peak on 550 acres of vineyard and mainly produces Cabernet Sauvignon and Chardonnay. This worked out great because she gained the opportunity to work with Winemaker Melissa Apter, UC Davis alumna and former Tignanello scholarship recipient. Not only did Melissa play a critical role in preparing Tiana for Italy, but having had the same education she shared invaluable insights and related everything they did in the cellar back to the theory taught at school. Understanding the theory of why and how a task is being performed was essential for improving Tiana's execution of winery operations. From understanding press-fraction treatments to what pump she needs to use when, everything was linked together and created more brilliant "ah-ha!" moments. The more experience she has in the winery, the better Tiana is able to apply what she has learned at school, "it absolutely all matters, every class."

After graduation Tiana hopes to continue working with the winemaking team at Vintage Wine Estates, they will soon discuss what is next for her... so stay tuned! Being a winemaker is the eventual goal regardless of where she ends up. Ultimately, she to be on the Sonoma Coast making Pinot Noir, Chardonnay and Sauvignon Blanc. Cold, harsh climates provide challenges that yield exquisite, elegant, and complex wines especially from these varietals.

Ultimately, she says, "I want my own small winery out on the coast, one that is innovative and sustainable, producing high quality wines with cutting-edge technology that gives back to the environment instead of taking from it." Tiana is extremely grateful to have been taught and mentored by such excellent faculty, they have helped to fuel her goals and dreams, and she is very proud to be a part of this program. She cannot wait to get out in the field to continue this path and she's never been more excited for what's to come.

### Course Profile: Wine Production class (VEN 124) *It's all about the color -- or is it?*

Students in Dr. Linda Bisson's Wine Production lab this year conducted several research projects aimed at showing the impact of wine processing decisions on wine color.

Student groups experimented with saignée, co-pigmentation, whole cluster fermentation and observed that the ML strain used during the malolactic fermentation can all impact color measurements. Total color as well as hue and browning were impacted in these trials. In the case of the co-pigmentation trial in informal blind sensory assessments students were able to detect differences in color among the treatments. In others, although the chemical analysis showed a clear difference, the ability to detect that difference was insignificant.



The bottom line? In preference tests even when a color difference was detected there was no distinct preference for any wine based on color. "It is important for students to see that simple changes in winemaking protocols can impact final wine color," said Bisson, "but it's equally important for them to understand the impact of that color difference in the marketplace".

## Our latest publications:

Chiara Broccanello, Piergiorgio Stevanato, Filippo Biscarini, Dario Cantu, Massimo Saccomani. A new polymorphism on chromosome 6 associated with bolting tendency in sugar beet. *BMC Genetics*. 12/7/2015, Vol. 16, p1-7, 7p.

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Uzguiza, L., R. González, M.R. González, M.W. Fidelibus, and P. Martín. 2015. A Preharvest Treatment of Ethephon and Methyl Jasmonate Affect Mechanical Harvesting Performance and Composition of 'Verdejo' Grapes and Wines. *European Journal of Horticultural Science* 80:97-102.

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Oberholster, A., B.L. Elmendorf, L.A. Lerno, E.S. King, H. Heymann, C.E. Brenneman, R.B. Boulton (2015). Barrel maturation, oak alternatives and micro-oxygenation: Influence on red wine aging and quality. *Food Chemistry* 173, 1250-1258.

Muhammad, S, Bl. Sanden, BD Lampinen, SS Silva, Mi Siddiqui, DR Smart, A Clivos, KA Shackel, T DeJong, PH Brown. (2015). Seasonal Changes in nutrient content in a mature deciduous tree species: Studies of Almond (*Prunus dulcis* (Mill.) D. A. Webb). *European Journal of Agronomy* (in press) (cif 3.67).

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