Science and Wine: The Wine of the Future

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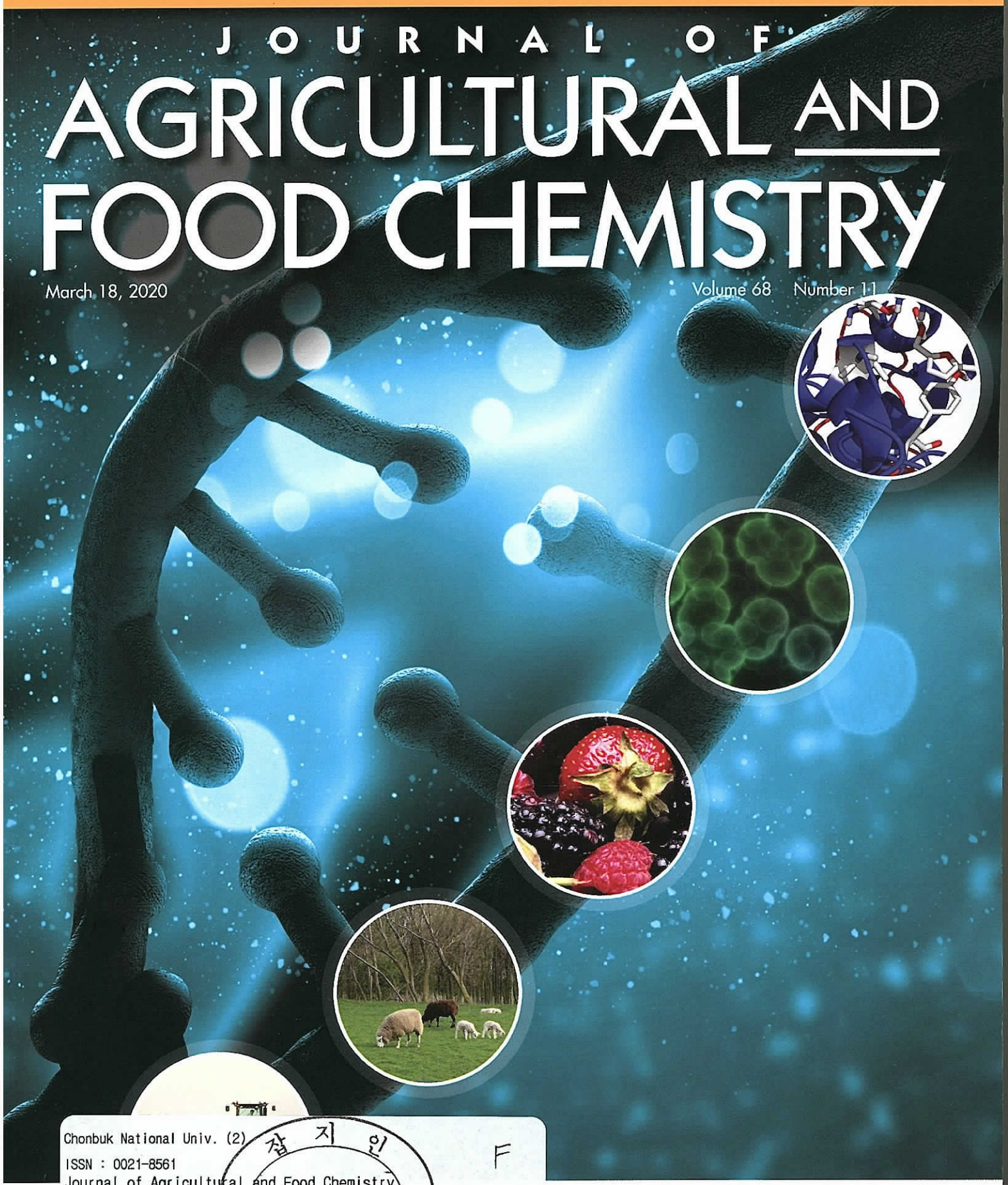

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SPECIAL SECTION: THE SCIENCE AND WINE: THE WINE OF THE FUTURE

Symposium

3299 DOI: 10.1021/acs.jafc.9b05698
First Science & Wine World Congress
Paula Silva*

Articles

3302 S DOI: 10.1021/acs.jafc.9b03661
Effect of Thermosonication and Physicochemical Properties of Wine on Culturability, Viability, and Metabolic Activity of *Brettanomyces bruxellensis* Yeast in Red Wines
Stela Križanović, Marina Tomašević,* Anet Režek Jambrak, Natka Ćurko, Leo Gracin, Katarina Lukić, and Karin Kovačević Ganić

3312 S DOI: 10.1021/acs.jafc.9b06195
High-Performance Liquid Chromatography−Hydrogen/Deuterium Exchange−High-Resolution Mass Spectrometry Partial Identification of a Series of Tetra- and Pentameric Cyclic Procyanidins and Prodelphinidins in Wine Extracts
Vakarė Merkytė, Edoardo Longo,* Michaël Jourdes, Alicia Jouin, Pierre-Louis Teissedre, and Emanuele Boselli

3322 S DOI: 10.1021/acs.jafc.9b05952
Gas Chromatography Combustion Isotope Ratio Mass Spectrometry for Improving the Detection of Authenticity of Grape Must
M. Perini, L. Strojnik, M. Paolini,* and F. Camin

Reviews

3330 DOI: 10.1021/acs.jafc.9b06574
Review of Distribution, Extraction Methods, and Health Benefits of Bound Phenolics in Food Plants
Zhenyu Wang, Shiyang Li, Shenghan Ge, and Shaoling Lin*

3344 DOI: 10.1021/acs.jafc.0c00052
C–P Natural Products as Next-Generation Herbicides: Chemistry and Biology of Glufosinate
Chengzeng Zhou, Xiaoxia Luo, Nengyi Chen, Lili Zhang,* and Jiangtao Gao*

Perspectives

3354 DOI: 10.1021/acs.jafc.0c00273
Challenges for Global Sustainable Nitrogen Management in Agricultural Systems
Lei Liu,* Xiuying Zhang,* Wen Xu, Xuejun Liu, Yi Li, Jing Wei, Meng Gao, Jian Bi, Xuehe Lu, Zhen Wang, and Xiaodi Wu

Articles

Agricultural and Environmental Chemistry

3362 S DOI: 10.1021/acs.jafc.9b05693
Phytotransformation and Metabolic Pathways of ^{14}C-Carbamazepine in Carrot and Celery
Ming Li, Yanan Cheng, Tengda Ding, Haiyan Wang, Wei Wang, Juying Li,* and Qingfu Ye

3372 S DOI: 10.1021/acs.jafc.9b06325
Assessing the Impacts of $Cu(OH)_2$ Nanopesticide and Ionic Copper on the Soil Enzyme Activity and Bacterial Community
Xiaoxia Zhang, Zhenlan Xu, Xiaoting Qian, Daohui Lin, Tao Zeng, Juliane Filser, Lingxiangyu Li,* and Melanie Kah*

3382 S DOI: 10.1021/acs.jafc.9b06429
High-Throughput Screening for Engineered Nanoparticles That Enhance Photosynthesis Using Mesophyll Protoplasts
Aodi Wang, Qijie Jin, Xin Xu, Aijun Miao, Jason C. White, Jorge L. Gardea-Torresdey, Rong Ji,* and Lijuan Zhao*

3390 S DOI: 10.1021/acs.jafc.9b06690
Functional Characterization of Two Carboxylesterase Genes Involved in Pyrethroid Detoxification in *Helicoverpa armigera*
Yong-Qiang Li, Li-Sha Bai, Cai-Xia Zhao, Jing-Jing Xu, Zhong-Juan Sun, Yan-Ling Dong, De-Xian Li, Xi-Li Liu, and Zhi-Qing Ma*

3403 S DOI: 10.1021/acs.jafc.9b07449
Design, Synthesis, and Biological Activity of Novel Diazabicyclo Derivatives as Safeners
Yuan-Yuan Zhang, Shuang Gao, Yong-Xuan Liu, Chen Wang, Wei Jiang, Li-Xia Zhao, Ying Fu,* and Fei Ye*

3415 S DOI: 10.1021/acs.jafc.9b07467
Alternative Pathway to the Formation of *trans*-Cinnamic Acid Derived from L-Phenylalanine in Tea (*Camellia sinensis*) Plants and Other Plants
Lanting Zeng, Xiaoqin Wang, Haibo Tan, Yinyin Liao, Ping Xu, Ming Kang, Fang Dong, and Ziyin Yang*

3425 S DOI: 10.1021/acs.jafc.9b08215
Tomato Chlorosis Virus Minor Coat Protein as a Novel Target To Screen Antiviral Drugs
Huanyu Yang, Guangcheng Zu, Yuewen Liu, Dandan Xie, Xiuhai Gan, and Baoan Song*

Bioactive Constituents, Metabolites, and Functions

3434 S DOI: 10.1021/acs.jafc.9b06285
Bitter-Tasting Amino Acids L-Arginine and L-Isoleucine Differentially Regulate Proton Secretion via T2R1 Signaling in Human Parietal Cells in Culture
Verena Stoeger, Ann-Katrin Holik, Kathrin Hölz, Tamir Dingjan, Joachim Hans, Jakob P. Ley, Gerhard E. Krammer, Masha Y. Niv, Mark Manuel Somoza, and Veronika Somoza*

3445 DOI: 10.1021/acs.jafc.9b06624
Optimization of Free Phytoprostane and Phytofuran Production by Enzymatic Hydrolysis of Pea Extracts Using Esterases
R. Domínguez-Perles, I. Sánchez-Martínez, M. D. Rodríguez-Hernández, I. López-González, C. Oger, A. Guy, T. Durand, J. M. Galano, F. Ferreres, and A. Gil-Izquierdo*

3456 S DOI: 10.1021/acs.jafc.9b07126
Pterostilbene Inhibits FcεRI Signaling through Activation of the LKB1/AMPK Pathway in Allergic Response
Chongyang Wang, Liangchang Li, Jingzhi Jiang, Li Li, Junfeng Li, Chang Xu, Shan Jin, Lianhua Zhu, and Guanghai Yan*

3466 S DOI: 10.1021/acs.jafc.9b07628
Investigating *E. coli* Coculture for Resveratrol Production with ^{13}C Metabolic Flux Analysis
Jaeseung Hong, Dae-Kyun Im, and Min-Kyu Oh*

3474 S DOI: 10.1021/acs.jafc.9b07909
Sesamin Induces Endothelial Nitric Oxide Synthase Activation via Transient Receptor Potential Vanilloid Type 1
Thi Hoa Pham, Sun Woo Jin, Gi Ho Lee, Jin Song Park, Ji Yeon Kim, Tuyet Ngan Thai, Eun Hee Han, and Hye Gwang Jeong*

3485 S DOI: 10.1021/acs.jafc.9b08107
Detection of Phytoestrogen Metabolites in Breastfed Infants' Urine and the Corresponding Breast Milk by Liquid Chromatography–Tandem Mass Spectrometry
Jialing Min, Zitong Wang, Chenglin Liang, Wenjie Li, Jie Shao, Kunrui Zhu, Lu Zhou, Jing Cheng, Shihong Luo, Lehan Yu, Yudong Wu, Mingyong Xie, and Xiaojuan Hu*

3495 S DOI: 10.1021/acs.jafc.0c00158
In Vitro Bioaccessibility of Carotenoids and Chlorophylls in a Diverse Collection of Spinach Accessions and Commercial Cultivars
Micaela Hayes, Marti Pottorff, Colin Kay, Allen Van Deynze, Juliana Osorio-Marin, Mary Ann Lila, Massimo Iorrizo,* and Mario G. Ferruzzi*

3506 DOI: 10.1021/acs.jafc.0c00370
Inhibitory Effects of Bound Polyphenol from Foxtail Millet Bran on Colitis-Associated Carcinogenesis by the Restoration of Gut Microbiota in a Mice Model
Ruipeng Yang, Shuhua Shan, Chen Zhang, Jiangying Shi, Hanqing Li, and Zhuoyu Li*

Biofuels and Biobased Materials

3518 S DOI: 10.1021/acs.jafc.9b06588
Intelligent Cellulose Nanofibers with Excellent Biocompatibility Enable Sustained Antibacterial and Drug Release via a pH-Responsive Mechanism
Hui He, Meixiao Cheng, Yuting Liang, Hongxiang Zhu,* Yupei Sun, Die Dong, and Shuangfei Wang

Biotechnology and Biological Transformations

3528 S DOI: 10.1021/acs.jafc.9b07737
Transcriptome and Metabolic Profiling Unveiled Roles of Peroxidases in Theaflavin Production in Black Tea Processing and Determination of Tea Processing Suitability
Gaoyang Zhang, Jihong Yang, Dandan Cui, Dandan Zhao, Yingying Li, Xiaochun Wan, and Jian Zhao*

3539 S DOI: 10.1021/acs.jafc.9b07855
Exploring Multifunctional Residues of Ribose-5-phosphate Isomerase B from *Ochrobactrum* sp. CSL1 Enhancing Isomerization of D-Allose
Xiaofeng Zhang, Xinqi Xu, Xuemei Yao, Rong Wang, Hengtao Tang, Xin Ju,* and Liangzhi Li*

3548 S DOI: 10.1021/acs.jafc.0c00225
Gut Microbiome-Based Diagnostic Model to Predict Coronary Artery Disease
Ying-Ying Zheng, Ting-Ting Wu, Zhi-Qiang Liu, Ang Li, Qian-Qian Guo, Yan-Yan Ma, Zeng-Lei Zhang, Yi-Li Xun, Jian-Chao Zhang, Wan-Rong Wang, Patigvl Kadir, Ding-Yu Wang, Yi-Tong Ma,* Jin-Ying Zhang,* and Xiang Xie*

Chemistry and Biology of Aroma and Taste

3558 S DOI: 10.1021/acs.jafc.9b07809
The Biosynthesis Mechanism Involving 2,3-Pentanedione and Aminoacetone Describes the Production of 2-Ethyl-3,5-dimethylpyrazine and 2-Ethyl-3,6-dimethylpyrazine by *Bacillus subtilis*
Huaizhi Zhang, Lijie Zhang, Xiaowei Yu,* and Yan Xu*

Food and Beverage Chemistry/Biochemistry

3568 DOI: 10.1021/acs.jafc.9b07824
Limitation of Maillard Reactions in Lactose-Reduced UHT Milk via Enzymatic Conversion of Lactose into Galactooligosaccharides during Production
Wei Zhang, Mahesha M. Poojary, Valentin Rauh, Colin A. Ray, Karsten Olsen, and Marianne N. Lund*

3576 S DOI: 10.1021/acs.jafc.9b07941
Relevance of the Concentrations and Sizes of Oligomeric Red Wine Pigments to the Color Intensity of Commercial Red Wines
Juuso Erik Laitila* and Juha-Pekka Salminen

3585 DOI: 10.1021/acs.jafc.9b08104
Behavioral Changes in Glutenin Macropolymer Fermented by *Lactobacillus plantarum* LB-1 to Promote the Rheological and Gas Production Properties of Dough
Fei Pei,* Lei Sun, Yong Fang, Wenjian Yang, Gaoxing Ma, Ning Ma, and Qiuhui Hu

3594 S DOI: 10.1021/acs.jafc.9b08235
Polyamine-Modified Magnetic Graphene Oxide Nanocomposites and HPLC-MS/MS Allow the Determination of Two Indolic Derivatives in Strong-Aroma Types of Base Baijiu
Wei Dong, Ruonan Guo, Wenxuan Lin, Miao Liu, Caihong Shen, Xiaotao Sun,* Baoguo Sun, and Bo Deng

3607 DOI: 10.1021/acs.jafc.0c00128
Rapeseed Protein Nanogels As Novel Pickering Stabilizers for Oil-in-Water Emulsions
Zhigao Wang,* Nan Zhang, Chong Chen, Rong He, and Xingrong Ju

3615 S DOI: 10.1021/acs.jafc.0c00413
Fate of Anthocyanins and Proanthocyanidins during the Alcoholic Fermentation of Thermovinified Red Musts by Different *Saccharomyces cerevisiae* Strains
Aude Vernhet,* Stéphanie Carrillo, Anaïs Rattier, Arnaud Verbaere, Véronique Cheynier, and Julie Mekoue Nguela

3626 S DOI: 10.1021/acs.jafc.0c01050
Comparison of Volatile Composition between Alcoholic Bilberry Beverages Fermented with Non-*Saccharomyces* Yeasts and Dynamic Changes in Volatile Compounds during Fermentation
Shuxun Liu, Oskar Laaksonen, Alexis Marsol-Vall, Baoqing Zhu, and Baoru Yang*

Functional Structure/Activity Relationships

3638 S DOI: 10.1021/acs.jafc.9b08252
Neuroprotection by Walnut-Derived Peptides through Autophagy Promotion via Akt/mTOR Signaling Pathway against Oxidative Stress in PC12 Cells
Fanrui Zhao, Ji Wang, Hongyan Lu, Li Fang, Hanxiong Qin, Chunlei Liu,* and Weihong Min*

3649 S DOI: 10.1021/acs.jafc.0c00784
Hydrophilic Astaxanthin: PEGylated Astaxanthin Fights Diabetes by Enhancing the Solubility and Oral Absorbability
Yanjun Liu, Lu Yang, Yongli Guo, Ting Zhang, Xing Qiao, Jingfeng Wang, Jie Xu,* and Changhu Xue*

New Analytical Methods

3656 DOI: 10.1021/acs.jafc.9b06650

Usage of Graphene Oxide in Fluorescence Quenching-Linked Immunosorbent Assay for the Detection of Cry2Ab Protein Present in Transgenic Plants
Smitha P. K., Christopher Bathula, Chandrashekara K. N., and Manjula Das*

3663 S DOI: 10.1021/acs.jafc.9b07542

Cationic Surfactant Modified 3D COF and Its Application in the Adsorption of UV Filters and Alkylphenols from Food Packaging Material Migrants
Shijuan Zhang,* Xia Wu, Chong Ma, Yanxin Li,* and Jinmao You*

3670 S DOI: 10.1021/acs.jafc.9b08114

TP-FRET-Based Fluorescent Sensor for Ratiometric Detection of Formaldehyde in Real Food Samples, Living Cells, Tissues, and Zebrafish
Haiyuan Ding, Gangqiang Yuan, Longpeng Peng, Liyi Zhou,* and Qinlu Lin

Omics Technologies Applied to Agriculture and Food

3678 S DOI: 10.1021/acs.jafc.9b07405

Comprehensive Transcriptome Analysis of lncRNAs Reveals the Role of lncAD in Chicken Intramuscular and Abdominal Adipogenesis
Meng Zhang, Xiangfei Ma, Yanhui Zhai, Daoyu Zhang, Liyan Sui, Wenting Li, Ruirui Jiang, Ruili Han, Guoxi Li, Zhuanjian Li, Yanbin Wang, Yadong Tian, Xiangtao Kang, and Gui-rong Sun*

Additions and Corrections

3689 DOI: 10.1021/acs.jafc.0c01255

Correction to Pest Control: Can Chitinases Help To Reduce Pesticide Use?
Ronivaldo Rodrigues da Silva* and Rafaela do Couto Santos

S Supporting Information available via online article

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Symposium Introduction

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First Science & Wine World Congress

ABSTRACT: The First Science & Wine World Congress entitled "The Wine of the Future" was held in Porto, Portugal, from May 8th to 10th, 2019. The congress comprised 34 oral communications and 40 poster presentations. These contributions were distributed among six sessions: wine traceability and authenticity, wine chemistry and sensorial wine experience, wine analysis, vine and wine technology, wine and health, and wine waste. The intention of this congress was to bring together the leading wine researchers to discuss the current state of knowledge as well as research needs aiming to design the wine that will be consumed in the future.

INTRODUCTION

Wine production involves many different knowledge areas: agricultural sciences, biotechnology, analytical chemistry, microbiology, genetics, oenology, nanotechnology, biochemistry, analytical biotechnology, physical chemistry, and instrumentation, among many others. Therefore, for wine industry improvement, the existence of forums where researchers from different scientific fields, together with winemakers, can discuss wine production is very important. In times like the present in which the wine sector faces new challenges, these discussions assume greater importance. This was the motivation for the organization of the First Science & Wine World Congress titled "The Wine of the Future" (Science & Wine Congress). The contributions in abstract form have been published in the abstract book of the Science & Wine Congress, whereas in this special issue of the *Journal of Agricultural and Food Chemistry*, only a selected number of original works are published. This introduction is intended to provide a brief summary of the Science & Wine Congress communications chosen to illustrate the diversity of works presented at the congress.

VITICULTURE

With regard to viticulture, the main Science & Wine Congress recommendations are that additional practices toward precision and sustainability must be adopted. Precision viticulture arises from terroir, i.e., from the fact that important characteristics of the grape production environment, such as water, light, and nutrient supply, often vary considerably over space and time within a single vineyard area.[1] To properly meet grape requirements, a wide set of techniques and technologies need to be applied to adjust crop management to environment variability.[2] Therefore, it is crucial to have a high-resolution description of vineyard spatial and temporal variability. This could be achieved by applying remote sensing technologies to precision viticulture, as shown by Raúl Morais in his oral communication titled "mySense: An Integrated Service Platform To Support Precision Viticulture Practices Incorporating Artificial Intelligence". The mySense environment was developed at the University of Trás-os-Montes e Alto Douro as a support tool for viticulture. This tool incorporates an artificial intelligence engine that has been tested by the Instituto dos Vinhos do Douro e Porto with the goal of achieving an effective tool for both quick and precise grapevine variety identification in the Douro Demarcated Region.[3,4] These maps allow for the adjustment of production inputs to a site specifically within a vineyard region, which also permit a better use of environmental resources.[2] Therefore, precision viticulture also helps environment preservation. As mentioned above, one of the Science & Wine Congress recommendations is the application of sustainable viticulture practices to reduce the environmental impact. The conversion of conventional vineyards to organic vineyards was also discussed at the congress. Organic farming involves the application of environmentally friendly solutions instead of synthetic chemical use. Among those solutions are preventive operations, such as mechanical soil management and sexual confusion.[5] Eros Borsato presented a study in which the aim was to compare both the environmental impact and the opportunity cost between conventional and organic viticulture. The study shows that, as a result of the lower amount of fertilizers, the organic management decreases the water footprint and carbon footprint. Organic viticulture also shows a better territory indicator and a greater marginal benefit, which is a consequence of a higher marketable price and lower management cost. Authors concluded that organic viticulture shows a better marginal benefit and a better environmental performance. In conclusion, discussion forums, such as this congress, are welcome and must encourage the participation of grape growers and winemakers, because they will greatly benefit to learn with researchers mainly about new precision and sustainable viticulture procedures.

VINIFICATION

Wine results from a long process of physical, chemical, and biological transformations. Wine quality is strongly affected by each step of its production. It is crucial that, altogether, researchers and winemakers try to improve the analytical methods at every phase of the production process.

In the Science & Wine Congress, the importance of the development of highly selective, sensitive, rapid, and reliable methods for increasing wine quality was discussed. This includes the implementation of good manufacturing practices to decrease the risk of wine spoilage. *Brettanomyces bruxellensis* is the main cause of microbial spoilage of red wines. Thermosonication is an alternative method of pasteurization that has been suggested for the treatment of foodstuffs.[6] At the congress, Marina Tomašević presented a study in which main objective was to model the thermosonication inactivation of *B. bruxellensis* in wine. According with the results, thermosonica-

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