

Anita Zamboni
Curriculum vitae et studiorum

Born on April, 10th, 1977 Bussolengo (VR), Italy

1. Contact details

University of Verona
Biotechnology Department
Strada Le Grazie, 15, 37134 Verona, Italy

Tel: +39 045 6835616

e.mail: anita.zamboni@univr.it

2. Degrees

(2003 – 2006) Phd in Agro-Industrial Biotechnology, University of Verona. Thesis: “Correlation between resveratrol biosynthesis and the transcriptional profile of grapevine cell culture (*Vitis* spp.).

(1996 – 2002) Master degree in Agro-Industrial Biotechnology, University of Verona. Thesis: “Cloning and molecular characterization of expansin gene family members in *Petunia hybrida*”.

3. Positions

Anita Zamboni is associate of Agricultural chemistry (since 21/12/2018) at Biotechnology Department (University of Verona). She has internationally recognized expertise in the physiological, biochemical, and molecular aspects of plant nutrition. Her research interests are focused on the characterization of the responses at plant-soil system levels to the different nutrient availability (e.g. N, Mg and Fe) and to the treatment with biostimulant (e.g protein hydrolysates, microalgae), and in this case, with particular attention to their mode of action. Recently, she has been involved in research aimed to develop of innovative fertilizers as FePO₄ nanoparticles and a new Fe chelate. He is author of 44 publications, most of which in international ISI journals (h-index 23, >1800 citations).

3. Previous position

- 21/12/2015 – 20/12/2018 Assistant Professor (RTDb), AGR/13, Biotechnology Department, University of Verona.
- 01/12/2012 – 30/11/2015 Assistant Professor (RTDa), AGR/13, Biotechnology Department, University of Verona.
- 01/03/2010 – 30/11/2012 Technician, Biotechnology Department, University of Verona.
- 31/12/2008 – 28/02/2010 Technician, Department for Sciences, Technologies and Markets of Grapevine and Wine (disused), University of Verona.
- 01/04/2008 – 31/12/2008 Research fellow, Department for Sciences, Technologies and Markets of Grapevine and Wine (disused), University of Verona, Scientific responsible: Prof. Zeno Varanini.
- 01/04/2006 – 31/03/2008 Research fellow, Scientific and Technology (disused), University of Verona, Scientific responsible: Prof. Mario Pezzotti.
- 01/12/2002 – 30/11/2005 Research fellow at Istituto Agrario di San Michele all’Adige (TN), project: “Resveratrol”. Tutor: dott. Fulvio Mattivi, scientific responsible: Dr. Riccardo Velasco.

4. Research visit

- 24/08/2015 – 18/09/2015: analysis of uptake and distribution of ^{26}Mg by maize roots by Laser Ablation (LA) Inductively Coupled Plasma Mass Spectrometry (ICP-MS). Grant: Cooperint 2015, Programma di Internazionalizzazione di Ateneo. The project was developed in collaboration with Prof. Søren Husted, Department of Plant and Environmental Sciences, University of Copenhagen.
- February/March 2003: acquisition of methods regarding the production of solid and liquid grapevine cell cultures in collaboration with Dr. Dr. Hanns-Heinz Kassemeyer (Phytopathologie Pflanzenschutz/Plant Pathology & Plant Protection; Staatliches Weinbauinstitut, Freiburg, Germany).

5. Publications

International journals

- 1) Fasani E, Zamboni A, Sorio D, Furini A, Dal Corso G. Metal Interactions in the Ni hyperaccumulating population of *Noccaea caerulea* Monte Prinzera. *Biology*, 2023, 12: 1537.
- 2) Bastianelli C, Pesante G, Ambrosini S, Zamboni A, Frison N. Upcycling of PHA-producing bacteria for biostimulants production and polyhydroxyalkanoates recovery. *Science of the Total Environment*, 2023, 888: 164238.
- 3) Ciurli A, Giagnoni L, Pastorelli R, Segà D, Zamboni A, Renella G, Varanini Z. A novel P nanofertilizer has no impacts on soil microbial communities and soil microbial activity. *Applied Soil Ecology*, 2022, 178: 104570.
- 4) Ambrosini S, Prinsi B, Zamboni A, Espen L, Zanzoni S, Santi C, Varanini Z, Pandolfini T. Chemical characterization of a collagen-derived protein hydrolysate and biostimulant activity assessment of its peptidic components. *Journal of Agricultural and Food Chemistry*, 2022, 70: 11201-11211.
- 5) Piccinelli F, Segà D, Melchior A, Ruggieri S, Sanadar M, Varanini Z, Zamboni A. Regreening properties of the soil slow-mobile $\text{H}_2\text{bpcd}/\text{Fe}^{3+}$ complex: steps forward to the development of a new environmentally friendly Fe fertilizer. *Frontiers in Plant Science*, 2022, 134: 964088.
- 6) Corsi S, Ruggeri G, Zamboni A, Prinsi B, Espen L, Ferrante A, Nosedà M, Varanini Z, Scarafoni A. A bibliometric analysis of the scientific literature on biostimulants. *Agronomy*, 2022, 12: 1257.
- 7) Buoso S, Zamboni A, Franco A, Comisso M, Guzzo F, Varanini Z, Pinton R, Tomasi N, Zanin L. Nodulating white lupins take advantage of the reciprocal interplay between N and P nutritional responses. *Physiologia Plantarum*, 2022, 174: e13607.
- 8) Martini F, Beghini G, Zanin L, Varanini Z, Zamboni A, Ballottari M. The potential use of *Chlamydomonas reinhardtii* and *Chlorella sorokiniana* as biostimulants on maize plants. *Algal Research*, 2021, 60: 102515.
- 9) Tolve R, Tchuente-Magaia FL, Verderese D, Simonato B, Puggia D, Galgano F, Zamboni A, Favati F. Physico-chemical and sensory acceptability of no added sugar chocolate spreads fortified with multiple micronutrients. *Food Chemistry*, 2021, 364: 130386.
- 10) Battista F, Masala C, Zamboni A, Varanini Z, Bolzonella D. Valorisation of Agricultural Digestate for the Ammonium Sulfate Recovery and Soil Improvers Production. *Waste and Biomass Valorization*, 2021, 12: 6903–6916.
- 11) Ambrosini S, Segà D, Santi C, Zamboni A, Varanini Z, Pandolfini T. Evaluation of the potential use of a collagen-based protein hydrolysate as a plant multi-stress protectant. *Frontiers in Plant Science*, 2021, 12: 600623.

- 12) Marastoni L, Lucini L, Miras-Moreno B, Trevisan M, Segal D, Zamboni A, Varanini Z. Changes in physiological activities and root exudation profile of two grapevine rootstocks reveal common and specific strategies for Fe acquisition. *Scientific Reports*, 2020, 10: 18839.
- 13) Segal D, Baldan B, Zamboni A, Varanini Z. FePO₄ NPs Are an Efficient Nutritional Source for Plants: Combination of Nano-Material Properties and Metabolic Responses to Nutritional Deficiencies. *Frontiers in Plant Science*, 2020, 11: 586470.
- 14) Mascia M, Segal D, Zamboni A, Varanini Z. Nitrogen starvation differentially influences transcriptional and uptake rate profiles in roots of two maize inbred lines with different NUE. *International Journal of Molecular Sciences*, 2019, 20: 4856.
- 15) Segal D, Ciuffreda G, Mariotto G, Baldan B, Zamboni A, Varanini Z. FePO₄ nanoparticles produced by an industrially scalable continuous-flow method are an available form of P and Fe for cucumber and maize plants. *Scientific reports*, 2019, 9: 11252.
- 16) Livigni S, Lucini L, Segal D, Navacchi O, Pandolfini T, Zamboni A, Varanini Z. The different tolerance to magnesium deficiency of two grapevine rootstocks relies on the ability to cope with oxidative stress. *BMC Plant Biology*, 2019, 19: 14.
- 17) Zanin L, Tomasi N, Zamboni A, Segal D, Varanini Z, Pinton R. Water-extractable humic substances speed up transcriptional response of maize roots to nitrate. *Environmental and Experimental Botany*, 2018, 147: 167-178.
- 18) Varanini Z, Cesco S, Tomasi N, Pinton R, Guzzo F, Zamboni A, Schlöter-Hai B, Schlöter, M, Giagnoni L, Arenella M, Nannipieri P, Renella G. Nitrate induction and physiological responses of two maize lines differing in nitrogen use efficiency: effects on N availability, microbial diversity and enzyme activity in the rhizosphere. *Plant and Soil*, 2018 422: 331-347.
- 19) Zamboni A, Celletti S, Zenoni S, Astolfi S, Varanini Z. Root physiological and transcriptional response to single and combined S and Fe deficiency in durum wheat. *Environmental and Experimental Botany*, 2018, 143: 172-184.
- 20) Pii Y, Zamboni A, Santo SD, Pezzotti M, Varanini Z, Pandolfini T. Prospect on ionic signatures for the classification of grapevine berries according to their geographical origin. *Frontiers in Plant Science*, 2017, 8: 640.
- 21) Santi C, Zamboni A, Varanini Z, Pandolfini T. Growth stimulatory effects and genome-wide transcriptional changes produced by protein hydrolysates in maize seedlings. *Frontiers in Plant Science* 2017, 8: 433.
- 22) Zanin L, Venuti S, Zamboni A, Varanini Z, Tomasi N, Pinton R. Transcriptional and physiological analyses of Fe deficiency response in maize reveal the presence of Strategy I components and Fe/P interactions. *BMC Genomics*, 2017, 18: 154.
- 23) Pii Y, Alessandrini M, Dall'Osto L, Guardini K, Prinsi B, Espen L, Zamboni A, Varanini Z. Time-resolved investigation of molecular components involved in the induction of NO₃⁻ high affinity transport system in maize roots. *Frontiers in Plant Science*, 2016, 7: 1657.
- 24) Zanin L, Venuti S, Tomasi N, Zamboni A, Francisco RMB, Varanini Z, Pinton R. Short-term treatment with the urease inhibitor N-(n-butyl) thiophosphoric triamide (NBPT) alters urea assimilation and modulates transcriptional profiles of genes involved in primary and secondary metabolism in maize seedlings. *Frontiers in Plant Science*, 2016, 7: 845.
- 25) Zamboni A, Zanin L, Tomasi N, Avesani L, Pinton R, Varanini Z, Cesco S. Early transcriptomic response to Fe supply in Fe-deficient tomato plants is strongly influenced by the nature of the chelating agent. *BMC Genomics*, 2016, 17: 35.
- 26) Zanin L, Tomasi N, Zamboni A, Varanini Z, Pinton R. The Urease Inhibitor NBPT Negatively Affects DUR3-mediated Uptake and Assimilation of Urea in Maize Roots. *Frontiers in Plant Science*, 2015, 6: 1007.
- 27) Zanin L, Zamboni A, Monte R, Tomasi N, Varanini Z, Cesco S, Pinton R. Transcriptomic analysis highlights reciprocal interactions of urea and nitrate for nitrogen acquisition by maize roots. *Plant and Cell Physiology*, 2015, 56: 532-548.

- 28) Pii Y, Alessandrini A, Guardini K, Zamboni A, Varanini Z. Induction of high-affinity NO₃⁻ uptake in grapevine roots is an active process correlated to the expression of specific members of the NRT2 and plasma membrane H⁺-ATPase gene families. *Functional Plant Biology*, 2014, 41: 353-365.
- 29) Cavallini E, Zenoni S, Finezzo L, Guzzo F, Zamboni A, Avesani L, Tornielli GB. Functional diversification of grapevine MYB5a and MYB5b in the control of flavonoid biosynthesis in a petunia anthocyanin regulatory mutant. *Plant and Cell Physiology*, 2014, 55(3): 517-534.
- 30) Zamboni A, Astolfi S, Zuchi S, Pii Y, Guardini K, Tononi P, Varanini Z. Nitrate induction triggers different transcriptional changes in a high and a low nitrogen use efficiency maize inbred line. *Journal of Integrative Plant Biology*, 2014, 56: 1080-1094.
- 31) Fasoli M, Dal Santo S, Zenoni S, Tornielli GB, Farina L, Zamboni A, Porceddu A, Venturini L, Bicego M, Murino V, Ferrarini A, Delledonne M, Pezzotti M. The Grapevine Expression Atlas Reveals a Deep Transcriptome Shift Driving the Entire Plant into a Maturation Program. *Plant Cell*, 2012, 24: 3489-3505.
- 32) Nikolic M, Cesco S, Monte R, Tomasi N, Gottardi S, Zamboni A, Pinton R, Varanini Z. Nitrate transport in cucumber leaves is an inducible process involving an increase in plasma membrane H⁺-ATPase activity and abundance. *BMC Plant Biology*, 2012, 12: 66.
- 33) Zamboni A, Zanin L, Tomasi N, Pezzotti M, Pinton R, Varanini Z, Cesco S. Genome-wide microarray analysis of tomato roots showed defined responses to iron deficiency. *BMC Genomics*, 2012, 13: 101.
- 34) Milli A, Cecconi D, Bortesi L, Persi A, Rinalducci S, Zamboni A, Zocatelli G, Lovato A, Zolla L, Polverari A. Proteomic analysis of the compatible interaction between *Vitis vinifera* and *Plasmopara viticola*. *Journal of Proteomics*, 2012, 75: 1284-1302.
- 35) Toffali K, Zamboni A, Anesi A, Stocchero M, Pezzotti M, Levi M, Guzzo F. Novel aspects of grape berry ripening and post-harvest withering revealed by untargeted LC-ESI-MS metabolomics analysis. *Metabolomics*, 2011, 7: 424-436.
- 36) Di Carli M, Zamboni A, Pè ME, Pezzotti M, Lilley KS, Benvenuto E, Desiderio A. Two-dimensional differential in gel electrophoresis (2D-DIGE) analysis of grape berry proteome during postharvest withering. *Journal of Proteome Research*, 2011, 10: 429-446.
- 37) Zamboni A, Di Carli M, Guzzo F, Stocchero M, Zenoni S, Ferrarini A, Tononi P, Toffali K, Desiderio A, Lilley KS, Pè ME, Benvenuto E, Delledonne M, Pezzotti M. Identification of putative stage-specific grapevine berry biomarkers and omics data integration into networks. *Plant Physiology*, 2010, 154: 1439-1459.
- 38) Polesani M, Bortesi L, Ferrarini A, Zamboni A, Fasoli M, Zadra C, Lovato A, Pezzotti M, Delledonne M, Polverari A. General and species-specific transcriptional responses to downy mildew infection in a susceptible (*Vitis vinifera*) and a resistant (*V. riparia*) grapevine species. *BMC Genomics*, 2010, 11: 117.
- 39) Zamboni A, Gatto P, Cestaro A, Pilati S, Viola R, Mattivi F, Moser C, Velasco R. Grapevine cell early activation of specific response to DIMEB, a resveratrol elicitor. *BMC Genomics*, 2009, 10: 1471.
- 40) Zamboni A, Minoia L, Ferrarini A, Tornielli GB, Zago E, Delledonne M, Pezzotti M. Molecular analysis of post-harvest withering in grape by AFLP transcriptional profiling. *Journal of Experimental Botany*, 2008, 59: 4145-4159.
- 41) Polesani M, Desario F, Ferrarini A, Zamboni A, Pezzotti M, Kortekamp A, Polverari A. cDNA-AFLP analysis of plant and pathogen genes expressed in grapevine infected with *Plasmopara viticola*. *BMC Genomics*, 2008, 9: 142.
- 42) Zamboni A, Vrhovsek U, Kassemeyer H-H, Mattivi F, Velasco R. Elicitor-induced resveratrol production in cell cultures of different grape genotypes (*Vitis* spp.). *Vitis*, 2006, 45: 63-68.
- 43) Zenoni S, Reale L, Tornielli GB, Lanfaloni L, Porceddu A, Ferrarini A, Moretti C, Zamboni A, Speghini A, Ferranti F, Pezzotti M. Downregulation of the *Petunia hybrida* alpha-expansin

gene PhEXP1 reduces the amount of crystalline cellulose in cell walls and leads to phenotypic changes in petal limbs. *Plant Cell* 2004, 16: 295-308.

44)

National journals

Zenoni S., Zamboni A., Dal Santo S., Fasoli M., Pezzotti M., Giovanni Battista Tornielli. Lo sviluppo delle conoscenze genomiche in vite e il loro potenziale utilizzo nella viticoltura attuale e futura. Review n. 17, *Italus Hortus* 19(2): 29-40.

Book chapter

1) Zenoni S., Zamboni A., Porceddu A., Pezzotti M. (2009) The role of expansins A in petunia development. *PETUNIA, Evolutionary, Developmental and Physiological Genetics*, 2009, Tom Gerats & Judith Strommer Editors, Springer, pp. 249-268. ISBN: 978-0-387-84795-5

2) Tomasi N., Monte R., Rizzardo C., Venuti S., Zamboni A., Cesco S., Pinton R., Varanini Z. (2009). Effects of water-extractable humic substances on molecular physiology of nitrate uptake in two maize inbred lines with different nitrogen use efficiency. UC Davis: Department of Plant Sciences, UC Davis. <http://escholarship.org/uc/item/3qn459bc>.

3) Tornielli G.B., Zamboni A., Zenoni S., Delledonne M., Pezzotti M. Transcriptomics and metabolomics for the analysis of grape berry development. *The Biochemistry of the Grape Berry*, 2011, Hernâni Gerós, Manuela Chaves & Serge Delrot Editors, pp. 218-240.

6. International congress participation as an invited speaker

- Zamboni A, Ambrosini S, Peli M, Sorio D, Pasquarelli F, Chiodi E, Vitulli F, Varanini Z. Effects of the soil application of a plant-derived protein hydrolysate on berry colour and ripening of table grape. Strategy & Commercial Track: New Biostimulant Products. Biostimulants World Congress, Milan, 28/11/2023 – 01/12/2023.
- Livigni S, Zamboni A, Pii Y, Navacchi O, Pandolfini T, Varanini Z. Physiological and molecular characterization of Mg deficiency in grapevine rootstocks, X International Symposium On Grapevine Physiology and Biotechnology, Verona, 13/06/2016 – 18/06/2016.
- Plant genomics as essential component of green system biology, Round Table of The XLIII Annual Meeting of the European Society for New Methods in Agricultural Research, Bolzano, 03/09/2014 – 06/09/2014.

7. National congress participation as an invited speaker

- Zamboni A. FePO₄ nanoparticles as fertilizer: acquisition mechanisms, efficiency and ecological impact. Workshop SICA, From root to food: different approaches to improve the quality of primary production. Viterbo, 22/06/2022.
- Zamboni A, Astolfi S, Zuchi S, Pii Y, Guardini K, Tononi P, Varanini Z. Nitrate induction triggers different transcriptional changes in a high and a low nitrogen use efficiency inbred line. 58th Italian Society of Agricultural Genetics Annual Congress, Alghero, 15/09/2014 -18/09/2014.
- Mascia M, Zamboni A, Renella G, Varanini Z, Guzzo F. Caratterizzazione di essudati radicali rilasciati da linee pure di mais durante l'induzione da nitrato. XXXII CONVEGNO NAZIONALE Società Italiana di Chimica Agraria, Bolzano, 07/09/2014 – 09/09/2014.

- Zamboni A, Pii Y, Pandolfini T, Livigni S, Segà D, Varanini Z. Caratterizzazione molecolare del trasporto del Mg in radice di vite: prime evidenze. XXXI CONVEGNO NAZIONALE Società Italiana di Chimica Agraria, Napoli, 16/09/2013 – 17/09/2013.
- Zamboni A, Di Carli M, Guzzo F, Stocchero M, Zenoni S, Ferrarini A, Tononi P, Toffali K, Desiderio A, Lilley KS, Pè ME, Benvenuto E, Delledonne M, Pezzotti M. Identification of putative stage-specific grapevine berry biomarkers and omics data integration into networks. "Gian Tommaso Scarascia Mugnozza". Premio Convegno congiunto AGI-SIBV-SIGA. Assisi, 19/09/2011 – 22/09/2011.
- Zamboni A, Zanin L, Tomasi N, Pezzotti N, Pinton R, Varanini Z, Cesco S. Modulazione dell'espressione genica in radici di piante di pomodoro Fe-carenti in risposta al rifornimento con fonti naturali di Fe. XVIII SICA Congresso Annuale, Piacenza, 20/09/2010 – 21/09/2010.
- Zamboni A, Di Carli M, Guzzo F, Stocchero M, Zenoni S, Chimento A, Toffali K, Desiderio A, Ferrarini A, Benvenuto E, Delledonne M, Pezzotti M. Grapevine ripening and post-harvest withering processes: a system biology approach. 53° Annual Congress of Italian Society of Genetica Agraria. Torino, 16/09/2009 – 19/09/2009.
- Zamboni A, Minoia L, Chimento A, Di Carli M, Desiderio A, Benvenuto E, Guzzo F, Toffali K, Varanini Z, Delledonne M, Pezzotti M. Characterization of the post-harvest withering process in grape analyzing changes in transcript, protein and metabolite profiles. XXVI SICA Congresso Annuale. Palermo, 30/09/2008 – 03/10/2008.
- Piva G, Zamboni A, Pedron L, Hietala AM, La Porta N. Profilo di colonizzazione del S. Cardinale ed isolamento ed analisi dei geni coinvolti nella resistenza a cancro. Valutazione ecologica e gestione sostenibile del cipresso: giornata conclusiva del progetto Ecocypre, IASMA, San Michele all'Adige (TN), Italy, 17/01/2008.

8. Patents

National patent

"Processo, e relativo impianto, per l'ottenimento di nanoparticelle di fosfati contenenti nutrienti minerali essenziali per la nutrizione delle piante" (10/04/2020).

9. Editorial Activities

- Member of editorial boarding of BMC Plant Biology, Frontiers in Plant Science e Plants.
- Participation in editorial committee: Proceedings of the X International Symposium on Grapevine Physiology and Biotechnology (ISHS), Acta Horticulture, Number 1188, November 2017. ISBN 9789462611832.

10. Prizes

- 10/05/2011 Florence (Italy): Premio antico fattore 2011, Accademia dei Georgofili, to Mario Pezzotti (with Anita Zamboni, Mariasole Di Carli, Flavia Guzzo, Matteo Stocchero, Sara Zenoni, Alberto Ferrarini, Paola Tononi, Ketti Toffali, Angiola Desiderio, Kathryn Lilley, Enrico Pè, Eugenio Benvenuto e Massimo Delledonne) for the work: "Identification of putative stage-specific grapevine berry biomarkers and omics data integration into networks" (Plant Physiol. 2010 154(3): 1439-1459)
- 20/09/2011 Assisi (Italy): "Gian Tommaso Scarascia Mugnozza" Award for Agricultural Genetics to Anita Zamboni and Di Carli Mariasole for the work: Zamboni A., Di Carli M., Guzzo F., Stocchero M., Zenoni S., Ferrarini A., Tononi P., Toffali K., Desiderio A., Lilley K.S., Pè M.E., Benvenuto E., Delledonne M., Pezzotti M. Identification of putative stage - specific grapevine

berry biomarkers and omics data integration into networks. *Plant Physiol.* 2010, 154: 1439-1459.

11. Teaching activities

- Supervisor of three students of PhD in Biotechnology, University of Verona (cycle 36°, 37° and 40°).
- 2021/2022 – today: Lecture in “Viticulture soils and rootstocks in grapevine cultivation” (3 CFU), Master's degree in Viticulture, Oenology and the Wine Market (interuniversity).
- 2020/2021 – today: Lecture in “Biotechnologies for a sustainable agricultural plant production” (6 CFU), Master Master's degree in Agri-Food Biotechnology, Biotechnology Department, University of Verona.
- 2016/2017 – today: Lecturer in “Agricultural Biochemistry” (6 CFU), Bachelor's degree in Viticultural and Oenological Science and Technology, Biotechnology Department, University of Verona.
- 2013/2014 and 2014/2015: Lecturer in “Agricultural Biochemistry” (5 CFU), Bachelor's degree in Viticultural and Oenological Science and Technology, Biotechnology Department, University of Verona.

12. Other activities

- Member of Teaching Staff of Master's degree in Viticulture, Oenology and the Wine Market (interuniversity), 2021 – today.
- Member of Teaching Staff of Biotechnology, Biotechnology Department, University of Verona, 2020 – today.
- Member of Teaching Staff of PhD in Biotechnology, University of Verona, 2019 – today.
- Member of Teaching Staff of Bachelor's degree in Viticultural and Oenological Science and Technology, Biotechnology Departement, Univeristy of Verona, 2013 – today.