



CURRICULUM VITAE

European Format



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Nationality Italian

WORK EXPERIENCE

Current position

December 2017 - December 2022: Researcher position (RTD-a). Dept. of Chemistry, Life Sciences and Environmental Sustainability, University of Parma, Parma, IT.

January 2017 - November 2017: research fellowship “Valorizzazione del biochar a scopi ambientali, agronomici e agroalimentari”. Dept. of Chemistry, Life Sciences and Environmental Sustainability, University of Parma, Parma, IT.

February 2016 - November 2016: post-doctoral position included into the project “Bio-revaluation of the Chemical District of Mantova by planning non-food biomass supply and its upgrading to bioproducts” (BIOMAN). Italtotec Consortium, Milano, IT.

July 2015 - July 2016: Department assistant. Stockbridge Agricultural School (group leader: Prof. O. Parkash Dhankher), University of Massachusetts, Amherst, MA, USA.

March 2015 - December 2016: post-doctoral collaboration. Analytical Chemistry Department (director: Dr. Jason C. White) of the Connecticut Agricultural Experiment Station (CAES), New Haven, CT, USA.

November 2014 - November 2015: research fellowship “Analisi sulla sicurezza per la salute e per l’ambiente determinata dalle interazioni tra nanoparticelle, nanomateriali e piante di interesse agroalimentare”. Dept. of Life Sciences, University of Parma, Parma, IT.

March 2013 - May 2013: collaboration with *S. cerevisiae* genotoxicity related to CdS QDs exposure. YMG research group (group leader: Prof. Carlo V. Bruschi), ICGB, Padriciano (TS), IT.

September 2010 - October 2014: scholarship “Genomica, trascrittomica e fisiologia dell’interazione pianta-nanoparticelle di CdS in pioppo”. Dept. of Environmental Sciences, University of Parma, Parma, IT.

EDUCATION AND TRAININGS

October 2014: “Cultore della Materia” title in SSD BIO/13, University of Parma, Parma, IT.

July 2-13 2012: Participation to MISTRAL Montpellier International School on ions and water transport in plants”, SupAgro/INRA campus, Montpellier, FRA.

January 2011 - March 2014: Ph.D fellowship in Biotechnology. Project title: Biotechnology of nanoparticle interactions with plants and yeasts (available on DSpace UNIPR website, <http://hdl.handle.net/1889/2492>). Supervisor: Prof. Nelson Marmiroli. Dept. of Environmental Sciences, University of Parma, Parma, IT.

May 2009 - April 2010: Master thesis: Effetti cellulari, molecolari di nano particelle metalliche: il caso dei nanodot a base di cadmio solfuro (Cellular and molecular effects of nanoparticles: the case of cadmium sulfide based nanodots). Tutor: Prof. Nelson Marmiroli. Dept. of Environmental Sciences, University of Parma, Parma, IT.

October 2007 - April 2010: Master Degree in Industrial Biotechnology, mark 110/110 with honors. University of Parma, Parma, IT.

October 2004 - July 2007: Bachelor Degree in Biotechnology, mark 104/110. University of Parma, Parma, IT.

June 2004: High School certificate, mark 92/100. ITIS Institute G. Capellini, La Spezia, IT.

Laboratory and work safety, administrative trainings

January 2022: gender harassment prevention training has been successfully acquired.

November 2021: informatic system security training has been successfully acquired.

October 2021: transparency in the public administration training has been successfully acquired.

May 2020: prevention and safety criteria for labor organization during SARS-CoV-2 emergency training has been successfully acquired.

April 2020: corruption prevention in public administration training has been successfully acquired.

December 2019: privacy and data safety training has been successfully acquired.

September 2014: in compliance with the Italian legislative Decree no. 81 dated 09/04/2008, laboratory safety trainings have been successfully acquired.

PERSONAL SKILLS AND COMPETENCES

| | |
|----------------|-----------|
| Mother tongue | ITALIAN |
| Other language | ENGLISH |
| Reading | Excellent |
| Writing | Excellent |
| Speaking | Excellent |

Social skills and competences

Acquisition of excellent skills of relationship both in professional and personal area.

Acquisition of excellent skills in scientific communication through experiences as

speaker in national and international conferences.

Organizational skills and competences

Acquisition of excellent skills in managing area both in human resource and research project during the work experiences at the University of Parma (Parma, IT), the Connecticut Agricultural Experiment Station (New Haven, CT, USA) and University of Massachusetts (Amherst, MA, USA).

Acquisition of excellent skills educational activities both in face-to-face and distance teaching modes.

Acquisition of excellent skills in managing bachelor and master degree students, as well as PhD students during the work experiences at the University of Parma (Parma, IT).

Participation and management of practical laboratory trainings of “Biotecnologie Applicate” course (professorship: Dr. Marta Marmioli) and “Tecnologie Ricombinanti” course (professorship: Prof. Nelson Marmioli) of Biotechnology BS curriculum, University of Parma, Parma, IT.

Participation to the organization of three international conferences: 7th International Conference on Phytotechnologies (Parma, September 26-29, 2010); Annual Conference of COST Action FA0905 “What’s for lunch? Nutrients and minerals in every day food” (Venice, November 24-25, 2011), 3rd Parma NANODAY (Parma, July 12-14, 2017), NANODAY IV (Milan, December 11-14, 2019).

Technical skills and competences

Acquisition of competences in the main techniques of Genetics, Molecular Biology, Biochemistry, Bioinformatics and Analytical Chemistry.

Acquisition of specific competences of molecular biology: DNA, RNA, protein extractions; end point and Real Time PCR amplification, gene cloning, sequencing, blotting.

Acquisition of specific competences on high-throughput data managing for microarray (Affymetrix) and RNAseq (Illumina).

Acquisition of excellent knowledge related to multivariate statistics and bioinformatics tools for data analysis, data mining for Systems Biology and network generation (R, Panther, KEGG, ThaleMine, GeneMania).

Acquisition of excellent knowledge on management of *Arabidopsis thaliana* (L.) Heyhn and *Saccharomyces cerevisiae* eukaryotic model organisms and related mutant libraries, including breeding.

Acquisition of specific skills related to wide used crop species management and impact on trophic chains: *Solanum lycopersicum* L., *Cucurbita pepo* L., *Lactuca sativa* L.

Acquisition specific competences related to nanoparticles and engineered nanomaterials (ENMs) management and characterization, including safety, dosimetry, z-potential and dynamic light scattering measurements, *in vitro* and *in vivo* tests.

Acquisition specific competences in Atomic Absorption Spectroscopy (AAS) and Inductively Coupled Plasma Mass Spectrometry (ICP-MS) sample preparation and analysis.

Acquisition specific competences in Scanning Election Microscope (SEM) and Transmission Electron Microscope (TEM) sample preparation and analysis.

Acquisition of excellent knowledge about Windows and Mac operative systems and global networks. Acquisition of excellent knowledge related to Microsoft Office, Microsoft Teams and Adobe Photoshop software.

European Driving License B.

EDUCATIONAL ACTIVITIES

Academic Year 2021/2022: Professor of “Genetic Engineering in Food Production” course (SSD BIO/13) of Food Systems: Management, Sustainability and Technologies BS curriculum, University of Parma, Parma, IT.

Academic Year 2020/2021: Professor of “Genetic Engineering in Food Production” course (SSD BIO/13) of Food Systems: Management, Sustainability and Technologies BS curriculum, University of Parma, Parma, IT.

Academic Year 2019/2020: Professor of “Genetic Engineering in Food Production” course (SSD BIO/13) of Food Systems: Management, Sustainability and Technologies BS curriculum, University of Parma, Parma, IT.

Academic Year 2018/2019: Professor of “Genetic Engineering in Food Production” course (SSD BIO/13) of Food Systems: Management, Sustainability and Technologies BS curriculum, University of Parma, Parma, IT.

Academic Year 2017/2018: Professor of “Organismi transgenici per la ricerca e le applicazioni” course (co-teaching with Prof. Elena Maestri, SSD BIO/13) of Biotechnology BS curriculum, University of Parma, Parma, IT.

From Academic Year 2017/2018: Assistant Professor during “Food Production and Genetic resources” course (professorship: Prof. Nelson Marmioli, SSD BIO/13) of Food Systems: Management, Sustainability and Technologies BS curriculum, University of Parma, Parma, IT.

Academic Year 2016/2017: Lecturer during “Tecnologie Ricombinanti” course (professorship: Prof. Nelson Marmioli) of Biotechnology BS curriculum, University of Parma, Parma, IT.

Practical laboratory trainer of “Tecnologie Ricombinanti” course (professorship: Prof. Nelson Marmioli) of Biotechnology BS curriculum, University of Parma, Parma, IT.

Seminar activities in “Systems Biology - Biologia dei Sistemi” course (professorship: Prof. Nelson Marmioli) of Biotechnology BS curriculum, University of Parma, Parma, IT.

March 2016: Seminar activities for “Biotechnology” PhD course (coordinator: Prof. Nelson Marmioli), University of Parma, Parma, IT.

October 2015: Seminar activities during the “Seminar Series 2015-2016” of the Connecticut Agricultural Experiment Station (New Haven, CT, USA).

September 2014: Assistant during the admission test to Biotechnology BS curriculum, University of Parma, Parma.

2014: Seminar activities in “Systems Biology” course (professorship: Prof. Nelson Marmioli) of Biotechnology BS curriculum, University of Parma, Parma, IT.

2013-2014: Assistant lecturer during “Biotecnologie Applicate” course (professorship: Dr. Marta Marmioli) of Biotechnology BS curriculum, University of Parma, Parma, IT.

September 2011: Seminar Activities during the training of the visiting professor Antonio Di Mauro (São Paulo State University-UNESP, Brazil).

2011 and 2013: Seminar activities during the trainings of TEMPUS projects.

2010-2014: Practical laboratory trainer of “Biotecnologie Applicate” course (professorship: Dr. Marta Marmioli) and “Tecnologie Ricombinanti” course (professorship: Prof. Nelson Marmioli) of Biotechnology BS curriculum, University of Parma, Parma, IT.

Academic tutoring

Academic tutoring or co-tutoring of 12 students in Biotechnology BS course and Food Systems: Management, Sustainability and Technologies BS course, University of Parma.

Academic tutoring or co-tutoring of 2 students in Industrial Biotechnology MS course, University of Parma.

Academic co-tutoring of 4 PhD students of Biotechnology & Life Sciences PhD Course, University of Parma.

RESEARCH ACTIVITIES

Integrated study of the simple eukaryote cell and plant organisms, with particular regard to molecular mechanisms, starting from genetics to genomics, transcriptomics, proteomics and metabolomics.

Integrated study of the organelles (mitochondrion and chloroplast), with particular regard to their involvement in the molecular response to different contaminants, in eukaryote model systems such as *S. cerevisiae* and *A. thaliana* and in crop species.

Biotechnological approaches focused to the development of sustainable agricultural fertilization, including nanotechnological tools.

Risk assessment, ecotoxicological impact and trophic transfer of Engineered nanomaterials (ENMs).

Effects of biochar and metal or ENMs on eukaryotic model organisms and crop plants.

EDITORIAL ACTIVITIES

2022: Guest-Editor for “Nanobiotechnologies for the Environment and Medicine” Special Issue, published on Nanomaterials (MDPI).

2021: Guest-Editor for “Application of Nanotechnology in Sustainable Agriculture” Special Issue, published on Agronomy (MDPI).

REVIEWER ACTIVITIES

2021: Reviewer for ANVUR VQR 2015-2019

Peer reviewed journals

From 2022: Reviewer for NanoImpact (Elsevier), Scientific Reports (Springer Nature); ACS Sustainable Chemistry & Engineering (ACS), Journal of Nanoparticle Research (Springer).

From 2021: Reviewer Editor for Frontiers in Plant Science, Crop and Product Physiology (Frontiers Media), Reviewer for Journal of Hazardous Materials (Elsevier), Reviewer for Environmental Management (Elsevier), Plants (MDPI).

From 2020: Reviewer for Science of the total Environment (Elsevier), Environmental Research (Elsevier).

From 2019: Reviewer for Environment International (Elsevier), Agronomy (MDPI).

From 2018: Reviewer for New Phytologist (Taylor & Francis).

From 2017: Reviewer for Environmental Pollution (Elsevier).

From 2016: Reviewer for Environmental Science & Technology (ACS), Plant Physiology and Biochemistry (Elsevier), and the International Journal of Molecular Science (MDPI).

From 2015: Reviewer for Environmental Science and Pollution Research (Springer) and the International Journal of Phytoremediation (Taylor & Francis).

NATIONAL AND INTERNATIONAL PROJECTS PARTICIPATION

Partnership for Research and Innovation in the Mediterranean Area (PRIMA) Programme Initiative, co-funded Horizon 2020 framework (2014-2020), SUSTAINOLIVE project (Jaen, Spain).

Rural development programme (Region) Emilia Romagna - Piano di Sviluppo Rurale 2014-2020 della Regione Emilia Romagna - 16.1.01 "Gruppi operativi del PEI per la produttività e la sostenibilità dell'agricoltura", sottomisura 16.1 "Sostegno per la costituzione e la gestione dei gruppi operativi del PEI in materia di produttività e sostenibilità dell'agricoltura" - Focus Area 2A, 4B, 4C, 5A e 5E: 2016-2019 "Uso del Biochar come filtro biologico per la depurazione delle acque: l'ammendante che depura l'ambiente" (RIFASA) (Azienda Agraria Sperimentale Stuard S.c.r.l.).

Rural development programme (Region) Emilia Romagna - Piano di Sviluppo Rurale 2014-2020 dell'Emilia Romagna - 16.1.01 "Gruppi operativi del PEI per la produttività e la sostenibilità dell'agricoltura", sottomisura 16.1 "Sostegno per la costituzione e la gestione dei gruppi operativi del PEI in materia di produttività e sostenibilità dell'agricoltura" - Focus Area 2A, 4B, 4C, 5A e 5E: 2016-2019 "Carbonizzazione dei residui agricoli: Biochar preziosa Soluzione per il Sequestro di Carbonio nel Suolo" (Azienda Agraria Sperimentale Stuard S.c.r.l.).

Horizon 2020 (2014-2020) H2020-SFS-2018-2020 Sustainable Food Security Topic LC-SFS.03.2018: "Sustainable Innovation of Microbiome Applications in food system" (SIMBA) (Luonnonvarakeskus (LUKE), Finland).

Horizon 2020 (2014-2020) FACCE - SURPLUS JPI collaboration call SFS-05-2015: Strategies for crop productivity, stability and quality: 2016-2018 "Intensify production, transform biomass to energy and novel goods and protect soils in Europe" (INTENSE) (Norwegian Institute of Bioeconomy Research (NIBIO), Norway).

2015-2017: Project "Bio-revaluation of the Chemical District of Mantova by planning non-food biomass supply and its upgrading to bioproducts" (BIOMAN).

CE Framework VII, KBBE: 2013-2018 "Ensuring the integrity of the European food chain" (FOODINTEGRITY).

CE Framework VII, REGPOT: 2013-2016 "Advancing research in agricultural and food sciences at Faculty of Agriculture, University of Belgrade" (AREA) (University of Belgrade, Serbia - Steering Committee).

TEMPUS CE EACEA: 2012-2016 "HUMAN Security (environment, quality of food, public health and society) on territories contaminated by radioactive agents" (HUMAN) (University of Cordoba, Spagna).

TEMPUS CE EACEA: 2010-2013 "EU Based Course in Foodstuff Expertise & Quality Control" (coordinator: Universitaet Weihenstephan).

TEMPUS CE EACEA: 2009-2012 “Advanced M.Sc. Program in Ecology for Volga-Caspian Basin” (AMEV) (coordinator: Universitaet Stuttgart).

2011: Preparation, validation and commercialization of prototype toxigenomics chip” (TOXICHIP).

2010: PRIN 2008: “Geni, prodotti genici, funzioni decontaminanti in Salicaceae per metalli e nanoparticelle.”

MEMBERSHIPS

PhD boarding committee

2019-2022: Member of the Boarding Committee of the “Biotechnology & Life Sciences” PhD Course, University of Parma. Coordinator: Prof. Marco Ventura.

Scientific societies

From 2020: Member of the Società Italiana Genetica Agraria (SIGA), Rieti, IT.

From 2018: Member of the Sustainable Nanotechnology Organization (SNO), Washington, DC, USA.

From 2018: Member of the Associazione Italiana Biologia e Genetica Generale e Molecolare (AIBG), Lecce, IT.

AWARDS

2019: Best Paper published on *Environ. Sci.: Nano* journal (Royal Society of Chemistry). Majumdar S, Pagano L, Wohlschlegel JA, Villani M, Zappettini A, White JC, Keller AA. Proteomic, gene and metabolite characterization reveal uptake and toxicity mechanism of cadmium sulfide quantum dots in soybean plants. doi: 10.1039/C9EN00599D.

2014: Best Oral/poster presentation, 1st Parma NANODAY, Parma, Italy.

PUBLICATIONS

SCOPUS author ID: 36465270500
total documents: 27
total citations: 1022
h-index: 17

***, co-first authorship.

#, co-corresponding authorship.

Marmiroli M,[#] Marmiroli N, Pagano L.[#] Nanomaterials Induced Genotoxicity in Plant: Methods and Strategies. *Nanomaterials* 2022, 12, 1658. doi: 10.3390/nano12101658.

Pagano L,[#] Marmiroli M,[#] Villani M, Magnani J, Rossi R, Zappettini A, White JC, Marmiroli N. Engineered nanomaterial exposure affects organelle genetic material replication in *Arabidopsis thaliana*. *ACS Nano*. 2022, 16, 2, 2249-2260. doi: 10.1021/acsnano.1c08367.

Marmiroli M,^{*} Pagano L,^{*} Rossi R, De La Torre-Roche R, Lepore GO, Ruotolo R, Gariani G, Bonanni V, Pollastri S, Puri A, Gianoncelli A, Aquilanti G, d’Acapito F, White JC, Marmiroli N. Copper Oxide nanomaterial fate in plant tissue: Nanoscale impacts on reproductive tissues. *Environ Sci Technol*. 2021. 55, 15, 10769–10783. doi: 10.1021/acs.est.1c01123.

Pagano L, Rossi R, Paesano L, Marmiroli N, Marmiroli M. miRNA regulation and stress adaptation in plants. *Env. Exp. Bot*. 2021, 104369. doi: 10.1016/j.envexpbot.2020.104369.

Marmiroli M, Lepore GO, Pagano L, d’Acapito F, Gianoncelli A, Villani M, Lazzarini

L, White JC, Marmiroli N. The fate of CdS Quantum Dots in plants as revealed by Extended X-ray Absorption Fine Structure (EXAFS) analysis. *Environ. Sci.: Nano*, 2020. 7, 1150-1162. doi: 10.1039/C9EN01433K.

Marmiroli M, Mussi F, Pagano L, Imperiale D, Lencioni G, Villani M, Zappettini Z, Marmiroli N. Cadmium sulfide quantum dots impact *Arabidopsis thaliana* physiology and morphology. *Chemosphere*. 2020, 124856. doi: 10.1016/j.chemosphere.2019.124856.

Pagano L, Caldara M, Villani M, Zappettini A, Marmiroli N, Marmiroli M. In vivo - in vitro comparative toxicology of cadmium sulphide quantum dots in the model organism *Saccharomyces cerevisiae*. *Nanomaterials* 2019, 9(4), 512. doi: 10.3390/nano9040512.

Majumdar S, Pagano L, Wohlschlegel JA, Villani M, Zappettini A, White JC, Keller AA. Proteomic, gene and metabolite characterization reveal uptake and toxicity mechanism of cadmium sulfide quantum dots in soybean plants. *Environ. Sci.: Nano*. 2019, 6, 3010-3026. doi: 10.1039/C9EN00599D.

Majumdar S, Ma C, Villani M, Zuverza-Mena N, Pagano L, Huang Y, Zappettini A, Keller A, Marmiroli N, Dhankher OP, White JC. Surface coating determines the response of soybean plants to cadmium sulfide quantum dots. *NanoImpact*. 2019. 100151. doi: 10.1016/j.impact.2019.100151.

Pagano L, Marmiroli M, Maestri E, White JC, Marmiroli N. Quantum dots exposure in plants: Minimizing molecular response. *Curr. Opin. Environ. Sci. Health*. 2018. 6, 71-76. doi: 10.1016/j.coesh.2018.09.001.

Pagano L, Maestri E, Caldara M, White JC, Marmiroli N, Marmiroli M. Engineered nanomaterial activity at the organelle level: impacts on the chloroplasts and mitochondria. *ACS Sustainable Chem. Eng.* 2018, 6 (10), 12562-12579. doi: 10.1021/acssuschemeng.8b02046.

De La Torre-Roche R, Pagano L, Majumdar S, Servin A, Zuverza-Mena N, Marmiroli N, Parkash Dhankher O, Eitzer BD, Ma C, White JC. Co-exposure of Imidacloprid and Nanoparticle Ag or CeO₂ to Cucurbita pepo (Zucchini): Contaminant Bioaccumulation and Translocation. *NanoImpact*. 2018. 11, 136-145. doi: 10.1016/j.impact.2018.07.001.

Elmer W, De la Torre-Roche R, Pagano L, Majumdar S, Zuverza-Mena N, Dimpka C, Gardea-Torresday J, White JC. Effect of metalloid and metallic oxide nanoparticles on Fusarium wilt of watermelon. *Plant Disease*. 2018. 102, 7, 1394-1401. doi: 10.1094/PDIS-10-17-1621-RE.

Ruotolo R, Maestri E, Pagano L, Marmiroli M, White JC, Marmiroli N. Plant response to metal-containing engineered nanomaterials: an omics-based perspective. *Environ Sci Technol*. 2018, 52(5), 2451-2467. doi: 10.1021/acs.est.7b04121.

Servin AD, Castillo HM, Hernandez-Viezcas JA, De Nolf W, De la Torre-Roche R, Pagano L, Pignatello J, Uchimiya M, Gardea-Torresday J, White JC. Bioaccumulation of CeO₂ nanoparticles by earthworms in biochar amended soil: A Synchrotron Microspectroscopy Study. *J. Agric. Food Chem.* 2018. 66 (26), 6609-6618. doi: 10.1021/acs.jafc.7b04612.

Pagano L, Pasquali F, Majumdar S, De La Torre-Roche R, Zuverza-Mena N, Villani M, Zappettini A, Marra RE, Isch SM, Marmiroli M, Maestri E, Parkash Dhankher O, White JC, Marmiroli N. Exposure of Cucurbita pepo to binary combinations of engineered nanomaterials: Physiological and molecular response. *Environ. Sci.: Nano*. 2017. 4, 1579-1590. doi: 10.1039/C7EN00219J.

Servin AD, Pagano L, Castillo-Michel H, De la Torre-Roche R, Hawthorne J, Hernandez-Viezcas JA, Loreda R, Majumdar S, Gardea-Torresday J, Parkash Dhankher O, White JC. Weathering in soil increases nanoparticle CuO bioaccumulation within a terrestrial food chain. *Nanotoxicology*. 2017, 11, 98-111. doi:

10.1080/17435390.2016.1277274.

Pasquali F, Agrimonti C, Pagano L, Zappettini A, Villani M, Marmiroli M, White JC, Marmiroli N. Nucleo-mitochondrial interaction in yeast in response to CdS QDs exposure. *J Haz Mat.* 2017, 324 (B), 744-752. doi: 10.1016/j.jhazmat.2016.11.053.

Pagano L, Servin AD, De La Torre-Roche R, Majumdar S, Mukherjee A, Hawthorne J, Marmiroli M, Maestri E, Marra RE, Isch SM, Parkash Dhankher O, White JC, Marmiroli N. Molecular Response of Crop Plants to Engineered Nanomaterials. *Environ Sci Technol.* 2016, 50 (13), 7198-7207. doi: 10.1021/acs.est.6b01816.

Servin AD, De la Torre Roche R, Castillo HM, Pagano L, Hawthorne J, Musante C, Pignatello J, Uchimiya M, White JC. Exposure of agricultural crops to nanoparticle CeO₂ in biochar-amended soil. *Plant Physiol. Biochem.* 2016, 110, 147-157. doi: 10.1016/j.plaphy.2016.06.003.

Mukherjee A, Majumdar S, Servin AD, Pagano L, Parkash Dhankher O, White JC. Carbon nanomaterials in agriculture: a critical review. *Front. Plant Sci.* 2016. doi: 10.3389/fpls.2016.00172.

Marmiroli M,* Pagano L,* Pasquali F, Zappettini A, Tosato V, Bruschi C, Marmiroli N. A genome-wide nanotoxicology screen of *Saccharomyces cerevisiae* mutants reveals the basis for cadmium sulphide quantum dot tolerance and sensitivity. *Nanotoxicology.* 2016, 10(1), 84-93. doi: 10.3109/17435390.2015.1019586.

Marmiroli M, Imperiale D, Pagano L, Villani M, Zappettini A, Marmiroli N. The proteomic response of *Arabidopsis thaliana* to cadmium sulfide quantum dots, and its correlation with the transcriptomic response. *Front. Plant Sci.* 2015. doi: 10.3389/fpls.2015.01104.

Marmiroli M,* Pagano L,* Savo Sardaro ML, Villani M, Marmiroli N. Genome-Wide Approach in *Arabidopsis thaliana* to assess the toxicity of cadmium sulfide quantum dots. *Environ Sci Technol.* 2014, 20, 48(10), 5902-9. doi: 10.1021/es404958r.

Beesley L, Marmiroli M, Pagano L, Pigoni V, Fellet G, Fresno T, Vamerali T, Bandiera M, Marmiroli N. Biochar addition to an arsenic contaminated soil increases arsenic concentrations the pore water but reduces uptake to tomato plants (*Solanum lycopersicum* L.). *Sci Total Environ.* 2013, 1, 454-455, 598-603. doi: 10.1016/j.scitotenv.2013.02.047.

BOOK CHAPTERS

(included in total documents)

Pagano L,[#] Marmiroli M. Future questions and approaches in plant-nanoparticle research. Chapter 9, in: Rico C.M. (Ed.), *Plant Exposure to Engineered Nanoparticles. Uptake, Transformation, Molecular and Physiological Responses, Nanomaterial-plant interactions*, Volume 3, Elsevier, Amsterdam, 2022, ISBN: 9780323850322. doi: 10.1016/B978-0-323-85032-2.00009-9.

Marmiroli M, Maestri E, Pagano L, Robinson BH, Ruotolo R, Marmiroli N. Methods for toxicological studies, in vivo, in vitro, genome wide. Chapter 8, in: Marmiroli N, White JC, Song J (Eds.), *Exposure to Engineered Nanomaterials: Fate and Effects on Humans and the Environment*, in: Tiwari A (Ed.), *Micro & Nano Technology Books: Advanced Nanomaterials Series*, Elsevier, Amsterdam, 2019. ISBN: 9780128148358. doi: 10.1016/B978-0-12-814835-8.00008-X.

PUBLISHED DATASETS

(available on NCBI GEO)

Pagano L, Rossi R, Marmioli M, Marmioli N. Copper Oxide nanomaterial regulation and fate in *Cucurbita pepo*. 2021. Accession Number: GSE173716.

Pagano L, Pasquali F, Marmioli M, Marmioli N. Whole transcriptome analysis of cadmium sulphide quantum dots response in *Saccharomyces cerevisiae*. 2019. Accession Number: GSE125759.

Pagano L, Marmioli M, Savo Sardaro ML, Marmioli N. A genome-wide approach in *Arabidopsis thaliana* to assess the toxicity of cadmium sulphide quantum dots. 2014. Accession Number: GSE53989.

CONFERENCE PROCEEDINGS

(presenting author)

9th International Workshop on Biomonitoring of Atmospheric Pollution, October 3-5, 2022, Naples, ITA.

Vannini A, Pagano L, Bartoli M, Fedeli R, Marmioli M, Malcevski A, Petraglia A, Loppi S. Lichens versus biochar: a preliminary study on the potential use of biochar to replace lichens for the environmental (bio)monitoring of potentially toxic elements. Poster presentation.

XX National Congress AIBG, September 23-24 2022, Rome, ITA.

Marmioli M, Pagano L, Paesano L, Gallo V, Rossi R, Luche S, Carlo S, White JC, Marmioli N, Maestri E. Biotechnological strategies to assess nanomaterials interactions with model organisms: from mechanistic understanding to applications. Oral presentation.

NanoInnovation 2022, September 23 2022, Rome, ITA.

Pagano L. From mechanistic understanding to application: the plant nanofertilization. Oral presentation.

LXV SIGA Annual Congress, September 6-9 2022, Piacenza, ITA.

Pagano L, Marmioli M, Villani M, Rossi R, Zappettini A, White JC, Marmioli N. Engineered nanomaterial exposure effect on organelle genetic material in *Arabidopsis thaliana*. Poster presentation.

10th Sustainable Nanotechnology Conference, November 3-5 2021, USA (online).

Pagano L, Marmioli M, Villani M, Magnani J, Rossi R, Zappettini A, White JC, Marmioli N. Engineered nanomaterial exposure effect on organelle genetic material in *Arabidopsis thaliana*. Oral presentation.

Marmioli M, Pagano L, Rossi R, De La Torre-Roche R, Lepore GO, Ruotolo R, Gariani G, Bonanni V, Pollastri S, Puri A, Gianoncelli A, Aquilanti G, d'Acapito F, White JC, Marmioli N. Copper Oxide nanomaterial fate in plant tissue: Nanoscale impacts on reproductive tissues. Oral presentation.

LXIV SIGA Annual Congress, September 14-16 2021, ITA (online).

Pagano L, Marmioli M, Rossi R, De La Torre-Roche R, Lepore GO, Ruotolo R, Gariani G, Bonanni V, Pollastri S, Puri A, Gianoncelli A, Aquilanti G, d'Acapito F, White JC, Marmioli N. Copper Oxide nanomaterial fate in plant tissue: Nanoscale impacts on reproductive tissues. Poster presentation.

SILS 2021, June 21-23 2021, Bologna, ITA (online).

Marmioli M, Lepore GO, Pagano L, d'Acapito F, Gianoncelli A, Pollastri S, Aquilanti G, White JC, Marmioli N. Utilization of synchrotron light based techniques to reveal nanoparticles-plants interaction. Oral presentation.

NanoInnovation 2020, September 15-18 2020, Rome, ITA (online).

Pagano L. Nanomaterials in the Environment: from implications to applications. Oral presentation.

Marmiroli N, Pagano L, Marmiroli M, White JC. Nanofertilizers: The next revolution for agriculture? Oral presentation.

Pagano L, Carlo S, Villani M, Magnani J, Zappettini A, White JC, Marmiroli M, Marmiroli N. Organelle genomes exposed to different ENMs in *Arabidopsis thaliana*: structural maintenance, function and abundance. Poster presentation.

SIGA Young workshop, July 07 2020 (online).

Pagano L, Villani M, Magnani J, Zappettini A, White JC, Marmiroli M, Marmiroli N. Structural maintenance, function and abundance of organelle genetic material in *Arabidopsis thaliana* exposed to engineered nanomaterials. Book of abstract only.

NANODAY IV, December 11-14 2019, Milano, ITA.

Pagano L, Magnani J, Villani M, Zappettini A, Maestri E, White JC, Marmiroli M. Maintenance and expression of organelle information in plants exposed to engineered nanomaterials. Oral presentation.

Rossi R, Pagano L, De La Torre-Roche R, Ruotolo R, Maestri E, White JC, Marmiroli M, Marmiroli N. Effects of Copper Oxide nanomaterial on plant flowering: A transcriptomic and physiological approach to enable sustainable food production. Oral presentation.

Rossi R, Ruotolo R, Marmiroli M, Pagano L, Marmiroli N. CdS QDs affect gametogenesis in *Saccharomyces cerevisiae*. Poster presentation.

8th Sustainable Nanotechnology Conference, November 7-9 2019, San Diego, CA, USA.

Rossi R, Pagano L, De La Torre-Roche R, Ruotolo R, Maestri E, White JC, Marmiroli M, Marmiroli N. Effects of Copper Oxide nanomaterial on plant flowering: A transcriptomic and physiological approach to enable sustainable food production. Oral presentation.

Marmiroli M, Lepore GO, Pagano L, d'Acapito F, Gianoncelli A, Villani M, White JC, Marmiroli N. The fate of CdS Quantum Dots in plants revealed by EXAFS. Oral presentation.

Rossi R, Ruotolo R, Marmiroli M, Pagano L, Marmiroli N. CdS QDs affect gametogenesis in *Saccharomyces cerevisiae*. Poster presentation.

XIX National Congress AIBG, October 4-5 2019, Milano, ITA.

Pagano L, Caldara M, Gallo V, Villani M, Zappettini, Srivastava V, White JC, Marmiroli M, Maestri E, Marmiroli N. The use of the monocellular eukaryote *Saccharomyces cerevisiae* as a model for mechanistic and physiological studies of human insights: the case of cadmium-based quantum dots. Book of abstract only.

16th International Phytotechnologies Conference, September 23-27 2019, Changsha City, CHN.

Marmiroli M, Lepore GO, Pagano L, d'Acapito F, Gianoncelli A, Villani M, White JC, Marmiroli N. The fate of CdS Quantum Dots in plants revealed by EXAFS. Oral presentation.

NanoInnovation 2019, June 11-14 2019, Rome, ITA.

Pagano L, Pasquali F, Majumdar S, De La Torre-Roche R, Zuverza-Mena N, Villani M, Zappettini A, Marra RE, Isch SM, Marmiroli M, Maestri E, Parkash Dhankher O, White JC, Marmiroli N. Effects of multiple treatment with ENMs on zucchini plants. Oral presentation.

APS Northeastern Division Annual Meeting, April 3-5 2019, State College, PA, USA.

Elmer W, Pérez CDP, Pagano L, De La Torre-Roche R, Zuverza-Mena N, Ma C, Borgata J, Hamers R, White JC. Nanoparticles of Cu for suppression of Fusarium root diseases. Oral presentation.

7th Sustainable Nanotechnology Organization Conference. November 8-11 2018, Alexandria, VA, USA.

Pagano L, Marmiroli M, Maestri E, White JC, Marmiroli N. Maintenance and expression of organelle information in plants exposed to engineered nanomaterials. Oral presentation.

Marmiroli M, Gallo V, Pagano L, Srivastava V, Marmiroli N. Systems nanotoxicology with yeast: from gene to phenotype. Oral presentation.

15th International Phytotechnologies Conference, October 1-5 2018, Novi Sad, SRB.

Pagano L, Maestri E, Caldara M, White JC, Marmiroli N, Marmiroli M. Engineered nanomaterial activity at the organelle level: impacts on the chloroplasts and mitochondria. Oral presentation.

De la Torre-Roche R, McMahon C, Pagano L, Majumdar S, Eitzer BD, Zuverza-Mena N, Ma C, Servin AD, Marmiroli N, Dhankher OP, White JC. Co-exposure of imidacloprid and weathered or unweathered Ag nanoparticles to Cucurbita pepo (zucchini): contaminant bioaccumulation and translocation. Oral presentation.

NanoInnovation 2018, September 11-14 2018, Rome, ITA.

Marmiroli M, Pagano L, Maestri E, Marmiroli N, White JC. Possible applications of Engineered nanomaterials in agriculture: the issue of interaction. Oral presentation.

1st PANAMERICANANO. November 27-30 2017, Guarujá, SP, BRA.

De La Torre-Roche R, Plaza-Pérez C, Ma C, Pagano L, Majumdar S, Zuverza-Mena N, White JC, Elmer W. Effects of engineered nanoparticles on plants root diseases and crop health. Oral presentation.

Majumdar S, Pagano L, Zuverza-Mena N, Ma C, Villani M, Zappettini A, Keller A, White JC. Response of soybean plants to cadmium sulphide as a function of surface coating. Oral presentation.

6th Sustainable Nanotechnology Organization Conference. November 5-7 2017, Los Angeles, CA, USA.

Marmiroli N, White JC, Srivastava V, Ruotolo R, Marmiroli M, Maestri E, Pagano L, Imperiale D, Pira G, Gallo V, Villani M, Zappettini A. Yeast as a model in toxicological studies on engineered nanomaterials (ENMs). Oral presentation.

Marmiroli N, White JC, Marmiroli M, Maestri E, Pagano L, Imperiale D, Gallo V, Villani M, Zappettini A. Higher plants response to metal-based nanoparticles: meta-analysis of data shows transcriptomics and proteomics rearrangements. Oral presentation.

Majumdar S, Zuverza-Mena N, Pagano L, Ma C, Villani M, Zappettini A, Keller A, White JC. Role of surface coating on accumulation of cadmium sulfide quantum dots in soybean plants and associated stress mechanisms. Oral presentation.

14th International Phytotechnologies Conference, September 25-29 2017, Montreal, CND.

Pagano L, Pasquali F, Majumdar S, De La Torre-Roche R, Zuverza-Mena N, Villani M, Zappettini A, Marra RE, Isch SM, Marmiroli M, Maestri E, Parkash Dhankher O, White JC, Marmiroli N. Exposure of Cucurbita pepo to binary combinations of engineered nanomaterials: Physiological and molecular response. Oral presentation.

Maestri E, Ruotolo R, Pagano L, Marmiroli M, White JC, Marmiroli N. A systems biology approach to elucidate the response of plants to metal-based nanomaterials. Oral presentation.

Majumdar S, Zuverza-Mena N, Pagano L, Ma C, Villani M, Zappettini A, Keller A, White JC. Surface coating as a determining factor for response of soybean plants to cadmium sulfide quantum dots. Oral presentation.

Elmer W, De La Torre-Roche R, Zuverza-Mena N, Pagano L, Ma C, White JC. The use of nanoparticles (NP) of plant micronutrients to enhance plant growth and suppress disease. Oral presentation.

De La Torre-Roche R, Pagano L, Majumdar S, Servin A, Zuverza-Mena N, Marmiroli N, Parkash Dhanker O, Eitzer BD, Ma C, White JC. Impact of Ag and CeO₂ nanoparticle exposure on Imidacloprid bioaccumulation by Cucurbita pepo (zucchini). Poster presentation.

14th ICOBTE Meeting, July 16-20 2017, Zurich, CHE.

Schwab F, Pagano L, Borschneck D, Levard C, Angeletti B, White JC, Rose J, Auffan M. Interactions of gold nanoparticles and the micronutrient silicon in a soil-grown legume at realistic exposure levels. Oral presentation.

Marmiroli N, White JC, Marmiroli M, Ruotolo R, Imperiale D, Paesano L, Pagano L, Pasquali F, Maestri E. Nuclear-mitochondrial interactions in the toxicity mechanisms of metal-containing nanoparticles in different organisms. Oral presentation.

3rd Parma NANODAY, July 12-14 2017, Parma, ITA.

Pagano L, Pasquali F, Majumdar S, De La Torre-Roche R, Zuverza-Mena N, Villani M, Zappettini A, Marra RE, Isch SM, Marmiroli M, Maestri E, Parkash Dhankher O, White JC, Marmiroli N. Physiological and molecular response Cucurbita pepo exposed to ENM binary combinations. Oral presentation.

Pasquali F, Agrimonti C, Pagano L, Zappettini A, Villani M, Marmiroli M, White JC, Marmiroli N. Nucleo-mitochondrial interaction of yeast in response to cadmium sulfide quantum dot exposure. Poster presentation.

Imperiale D, Marmiroli M, Pagano L, Villani M, Zappettini A, Marmiroli N. The proteomic response of Arabidopsis thaliana to cadmium sulfide quantum dots and its correlation with the transcriptomic response. Poster presentation.

27th Annual SETAC Meeting, May 7-11 2017, Bruxelles, BEL.

Schwab F, Pagano L, Borschneck D, Levard C, Angeletti B, White JC, Rose J, Auffan M. Interactions of gold nanoparticles and the micronutrient silicon in a soil-grown legume at realistic exposure levels. Oral presentation.

NanoImpact Conference, March 12-17 2017, Monte Verità, Ascona, CHE.

Marmiroli N, White JC, Marmiroli M, Ruotolo R, Imperiale D, Paesano L, Pagano L, Pasquali F, Maestri E. Nuclear-mitochondrial interactions in the toxicity mechanisms of metal-containing nanoparticles in different organisms. Oral presentation.

XVII National Congress AIBG, September 30 - October 1 2016, Cagliari, ITA.

Marmiroli N, Ruotolo R, Marmiroli M, Imperiale D, Pagano L, Pasquali F, Maestri E. Molecular mechanisms of toxicity of metal-containing nanoparticles in plants: an omics approach. Oral presentation.

13th International Phytotechnologies Conference "Plant-Based Solutions For Environmental Problems: From Lab To Field", September 26-28 2016, Hangzhou City, Zhejiang Province, CHN.

Marmiroli N, Ruotolo R, Marmiroli M, Imperiale D, Paesano L, Pagano L, Pasquali F, Pira G, Maestri E. Mitochondrial disruption as a molecular mechanism of toxicity of metal-containing nanoparticles. Oral presentation.

Joint Meeting of the APS-Caribbean-Division and the Latin-American-Phytopathological-Society and the Mexican-Society-of-Phytopathology, Jul 19-23 2016. Mexico City, MEX.

Elmer W, De La Torre-Roche R, Pagano L, White JC. Nanoparticles of micronutrients suppress Fusarium wilt of watermelon. Oral presentation.

8th International Nanotoxicology Congress, June 1-4 2016, Boston, MA, USA.

Pagano L, Servin A, De La Torre-Roche R, Majumdar S, Hawthorne J, Marmiroli M, Maestri E, Marmiroli N, Parkash Dhankher O, White JC. Functional nanotoxicology applied to crop species exposed to engineered nanomaterials. Oral presentation.

251st ACS National Meeting, March 13-17 2016, San Diego, CA, USA.

De La Torre-Roche R, Servin A, Pagano L, Majumdar S, Hawthorne J, White JC. Trophic transfer of engineered nanoparticles in terrestrial food chains. Oral presentation.

2nd Parma NANODAY, December 3-4 2015, Parma, ITA.

Pagano L, Servin AD, De La Torre-Roche R, Majumdar S, Mukherjee A, Hawthorne J, Marmiroli M, Maestri E, Marra RE, Parkash Dhankher O, White JC, Marmiroli N. Nanomaterials and crop plants: health and environmental safety related to molecular effects of ENMs exposure. Oral presentation.

Imperiale D, Marmiroli M, Pagano L, Villani M, Zappettini A, Marmiroli N. An integrated multi-“omics” approach to understand CdS quantum dots (CdS QDs) response in Arabidopsis thaliana mutants. Oral presentation.

Pasquali F, Marmiroli M, Pagano L, Agrimonti C, Zappettini A, Tosato V, Bruschi C, Marmiroli N. High through put genomic and transcriptomic analysis of CdS QDs response in Saccharomyces cerevisiae. Poster presentation.

4th Sustainable Nanotechnology Organization Conference, November 8-10 2015, Portland, OR, USA.

White JC, Pagano L, Marmiroli N. Nanomaterials and crop plants: using molecular response to assess health and environmental safety after exposure. Oral presentation.

12th International Conference on Phytotechnologies, September 27-30 2015, Manhattan, KS, USA.

Marmiroli M, Pagano L, Pasquali F, Zappettini A, Tosato V, Bruschi C, Marmiroli N. Basis for cadmium sulphide quantum dot tolerance and sensitivity: a genome-wide nanotoxicology screening of Saccharomyces cerevisiae mutants. Oral presentation.

Pagano L, Servin A, De La Torre-Roche R, Majumdar S, Mukherjee A, Hawthorne J, Marmiroli M, Maestri E, Marra RE, Parkash Dhankher O, White JC, Marmiroli N. Nanomaterials and crop plants: health and environmental safety related to molecular effects of ENMs exposure. Poster presentation.

1st Parma NANODAY, November 28 2014, Parma, ITA.

Pagano L, Marmiroli M, Villani M, Marmiroli N. Functional toxicogenomics of CdS QDs in Arabidopsis thaliana. Oral presentation.

Pagano L, Marmiroli M, Pasquali F, Zappettini A, Tosato V, Bruschi C, Marmiroli N. Functional toxicogenomics of CdS QDs in Saccharomyces cerevisiae. Poster presentation.

Imperiale D, Marmiroli M, Pagano L, Paredi G, Marmiroli N. Proteomics of Arabidopsis thaliana mutants resistant to CdS Quantum Dots (CdS QDs). Poster presentation.

11th International Conference on Phytotechnologies, September 30 - October 3 2014, Heraklion, GRE.

Pagano L, Marmiroli M, Imperiale D, Marmiroli N. Toxicogenomics of CdS QDs interactions with Arabidopsis thaliana. Oral presentation.

Imperiale D, Marmiroli M, Pagano L, Marmiroli N. Proteomics of Arabidopsis thaliana mutants resistant to CdS Quantum Dots (CdS QDs). Poster presentation.

Ricerca e Industria alleate per il futuro event, November 11 2013, Parma, ITA.

Pagano L, Marmioli M, Savo Sardaro ML, Marmioli N. Approccio genome-wide per la valutazione della tossicità di nanoparticelle CdS in *Arabidopsis thaliana*. Oral presentation.

10th International Conference on Phytotechnologies, October 1-4 2013, Syracuse, NY, USA.

Pagano L, Marmioli M, Savo Sardaro ML, Marmioli N. Toxicogenomics of CdS nanomaterials in *Arabidopsis thaliana* and *Saccharomyces cerevisiae*. Oral presentation.

XV National Congress AIBG, September 27-28 2013, Arcavacata di Rende, ITA.

Maestri E, Gulli M, Marmioli M, Graziano S, Pagano L, Savo Sardaro M L, Marmioli N. Toxicogenomics with model organisms: a new approach for studying the effects of chemicals and contaminants. Oral presentation.

12th International Conference on the Biogeochemistry of Trace Elements, July 16-20 2013, Athens, GA, USA.

Marmioli M, Pagano L, Savo Sardaro ML, Marmioli N. Toxicogenomics of two *Arabidopsis* mutants resistant to CdS NPs. Oral presentation.

9th International Conference on Phytotechnologies, September 11-14 2012, Hasselt, BEL.

Marmioli M, Pagano L, Savo Sardaro ML, Marmioli N. Whole-genome expression analysis of two *Arabidopsis* mutants resistant to CdS NPs. Oral presentation.

Beesley L, Marmioli M, Pagano L, Pighi V, Marmioli N. Impact of biochar on arsenic uptake in tomato plants (*Solanum lycopersicum* L.). Poster presentation.

Nanomateriali e Salute, May 10-11 2012, Rome, ITA.

White JC, Marmioli M, Pagano L, Savo Sardaro M L, Marmioli N. Physiological and genotoxic impacts of nanomaterial exposure on plants. Poster presentation.

Second Annual Conference of COST Action FA0905 “What’s for lunch? Nutrients and minerals in every day food”, November 24-25 2011, Venice, ITA.

Marmioli M, Pagano L, Savo Sardaro ML, Marmioli N. Physiological characterization and transcription analysis of two *Arabidopsis* mutants resistant to CdS nanoparticles. Oral presentation.

Beesley L, Marmioli M, Pagano L, Pighi V, Marmioli N. uptake of arsenic into tomato plants (*Solanum Lycopersicum* L.) grown on a contaminated, fertilised mine soil amended with biochar: consequences for soil quality, plant health and food safety. Poster presentation.

COST 869 “Mitigation Options for Nutrient Reduction in Surface Water and Groundwaters Conference”, October 12-14 2011, Keszthely, HUN.

Beesley L, Marmioli M, Pagano L, Pighi V, Marmioli N. Managing N,P,K excesses in soils, from applied fertilisers, using biochar; direct implications to tomato plant (*Solanum lycopersicum* L.) health and consequences to the mobility and uptake of trace elements. Poster presentation.

8th International Conference on Phytotechnologies, Portland, September 13-16 2011, OR, USA.

Marmioli M, Pagano L, Savo Sardaro ML, Marmioli N. Regulation of genes involved in conferring resistance to CdS NPs in *Arabidopsis thaliana*. Oral presentation.

11th International Conference on the Biogeochemistry of Trace Elements, July 3-7 2011, Florence, ITA.

Marmioli M, Pagano L, Savo Sardaro ML, Marmioli N. Phenotypic and genotypic characterization of two *Arabidopsis* mutants resistant to CdS nanoparticles. Poster presentation.

7th International Conference on Phytotechnologies, September 26-29 2010, Parma,

ITA.

Marmioli M, Pagano L, Savo Sardaro ML, Marmioli N. Phenotypic and genotypic characterization of two Arabidopsis mutants resistant to CdS nanoparticles. Oral presentation.

Autorizzo il trattamento dei miei dati ai sensi del Decreto Legislativo 30 giugno 2003, n. 196 - Codice in materia di protezione dei dati personali.

In compliance with the Italian legislative Decree no. 196 dated 30/06/2003, I hereby authorize the use of my personal details.