

PERSONAL INFORMATION

Nelson Marmioli

📍 Consorzio Interuniversitario Nazionale per le Scienze Ambientali
c/o Dip. Scienze Chimiche, della Vita e della Sostenibilità Ambientale, Università di Parma, 43124
Parma (Italy)
✉ nelson.marmioli@unipr.it / cinsa@unipr.it

WORK EXPERIENCE

2011-today
1996-2017

Director of the Consorzio Interuniversitario Nazionale per le Scienze Ambientali
Full Professor

Università degli Studi di Parma, Parma (Italy)

Scientific research and teaching activity in Recombinant DNA Technologies, Environmental Biotechnologies, Genomics and transcriptome analysis, Systems Biology

Current teaching activities: Food production and genetic resources" - "Food biotechnology and biotechnological foods"

Director of Departmental Division

Director of Department of Life Sciences (2012-2016)

Director of the Department of Environmental Sciences (2000-2004, 2012-2016)

Member of the Academic Senate (2000-2004, 2012-2016)

Coordinator of the PhD course in Biotechnology

Coordinator of the University Degree in Biotechnology

Rector Delegate and President of the Committee for University Sport Activities

Director of the International University Master Course "Science and technology for sustainable development in contaminated sites"

MAIN RESEARCH ACTIVITIES

1. Application of environmental biotechnologies for sustainability. Phytoremediation, bioremediation, emerging contaminants (nanomaterials and nanoparticles), interaction of plants with pollutants (outdoor and indoor)
2. Genomics and proteomics of environmental stress response; genes and gene products in the adaptive response and in stress response; new proteomic tools based on 2D analysis and mass spectrometry
3. Analysis of the effect of environmental stress and cultural conditions on protein composition of cereal grains (durum wheat and rice) through proteomics, ionomics and structural analyses
4. Analysis of the effect of nanoparticles on plants, fungi and animal organisms in stress conditions relevant for nanotechnology industry. Plants as "cell factories" in the synthesis of nanoparticles
5. Development of molecular nanosensors and biosensors based on protein and DNA for analysis of food composition and quality; development of microsenors for on-line control of food supply chains, development of Lab-on-chip systems. Molecular traceability of food and feed supply chains for food safety and authenticity protection.
6. Development of analytical systems for regulation of gene expression mediated by miRNA in humans in response to viral infections and pathological processes. Genomic, transcriptomic, proteomic analyses.
7. Innovative methodologies as countermeasure against deliberate threats towards environmental and food resources
8. Development of innovative tools for toxicogenomic analyses based on cellular and macromolecular chips (DNA, proteins)
9. Production of selected plants as natural resources to decrease the impact of conventional energy sources through the use of renewable resources and production of "biofuels"

- 1991–1995 Full Professor**
 Facoltà di Scienze Matematiche, Fisiche e Naturali, Università degli Studi di Parma, Parma (Italy)
 Research and teaching activity in the field of Biology
- 1990–1991 Full Professor**
 Università di Bologna, Facoltà di Agraria, Bologna (Italy)
 Scientific research and teaching activity in Agricultural Genetics and Genetics
- 1986–1990 Full Professor**
 Università degli Studi di Lecce, Lecce (Italy)
 Scientific research and teaching activity in Genetics
- 1983–1986 Associate Professor**
 Università degli Studi di Parma, Parma (Italy)
 Scientific research and teaching activity in Applied Genetics
- 1979–1982 Adjunct Professor**
 Università degli Studi di Udine, Udine (Italy)
 Scientific research and teaching activity in Agricultural Genetics
- 1978–1978 Associate Professor**
 University of Chicago, Chicago (United States)
- 1973–1977 Researcher**
 Università degli Studi di Parma, Parma (Italy)
 Scientific Research and teaching activity in Genetics of microorganisms and Applied Genetics

EDUCATION AND TRAINING

- 1967–1971 Master in Biology (Laurea in Scienze Biologiche)** EQF level 7
 Università degli Studi di Parma, Parma (Italy)
 Basic sciences, Mathematics, Physics, Inorganic and organic chemistry
 Plant and animal biology, Botany, Zoology, Microbiology, Genetics, Biochemistry, Molecular Biology, Ecology, Human Anatomy, General Physiology.

PERSONAL SKILLS

Mother tongue(s) Italian

Foreign language(s)	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C2	C2	C2	C2	C2

Levels: A1 and A2: Basic user - B1 and B2: Independent user - C1 and C2: Proficient user
Common European Framework of Reference for Languages

Communication skills

Excellent communication skills in academic environment, teaching and scientific research, acquired through many years of experience in University lecturing, participation to conferences, seminars, congresses.

Excellent ability in adapting to multicultural and international contexts, acquired through many years of experience in cooperation with scientists and students from abroad.

Excellent ability to work in a research team.

Organisational / managerial skills

Long term career in organization and management of research groups and teams, as Director of University Departments, President of PhD Schools, President of Bachelor and Master degrees, Organiser of conferences and congresses.

Excellent expertise in managing research projects and activity in University degrees.

Responsibility in management of University structures, Departments, coordination of researchers and professors, students, PhD students, post docs.

Job-related skills

Expertise in environmental biotechnologies, agricultural genetics, sustainable agriculture.

Organisation and management of research projects at National, European and international level.

Involvement in international events, evaluators of research proposals, Editor of scientific books and journals, reviewer for scientific journals.

Work experience in multidisciplinary teams, large networks of scientists.

Organisation of events for technological transfer and stakeholder involvement.

Digital skills

SELF-ASSESSMENT				
Information processing	Communication	Content creation	Safety	Problem solving
Proficient user	Independent user	Independent user	Independent user	Independent user

Digital skills - Self-assessment grid

Driving licence

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ADDITIONAL INFORMATION

Honours and awards

Milton P. Gordon Award for excellence in the career related to environmental biotechnologies (International Phytotechnology Society, 2013)

Honours and awards

Member of the panel of the Italian Society for Agricultural Genetics on environmental and human health risk assessment in exploitation of modern biotechnology (since 2007)

Honours and awards

Chairman of the Technological Area on Chemical, Biological, RadioNuclear hazards of the Italian Security Platform SERIT

Honours and awards

Member of the "Working Group of External Scientific Experts" of EFSA (2010-2011)

Honours and awards

Member of the Working Group on "Agro-Food biotechnologies" of the National Committee for Biosafety, Biotechnologies and Life Sciences of the Presidency of the Council of Ministries (2008)

Honours and awards

Member of the eighth meeting of the Conference of the Parties to the Convention on Biological

Diversity (COP 8) and of the third meeting of the Conference of the Parties serving as the meeting of the Parties to the Biosafety Protocol (COP-MOP 3), Curitiba (Brazil), 2006)

Honours and awards	Participation to the RA-RM European Workshop on the interface between risk assessment and risk management (2003)
Honours and awards	Member of the Italian Ministry of Agriculture Advisory Committee on risk assessment in the dissemination of recombinant organisms (2002)
Honours and awards	Participation to the Scientific Committee organised by IPTS (Institute for Prospective Technological Studies), Joint Research Centre, Seville (Spain) on risk assessment of GMOs (2002)
Honours and awards	Member of the Working Group on Assessment of risks from biotechnologies of the National Committee for Biosafety and Biotechnologies of the Presidency of the Council of Ministries (2000)

Parma, July 2022

ANNEXES

- List of references

Recent publications

- Caldara, M., Bolhuis, H., Marmioli, M., Marmioli, N. (2025) Biofilm Formation, Modulation, and Transcriptomic Regulation Under Stress Conditions in *Halomicronema* sp. *International Journal of Molecular Sciences*, 26, 673, doi: 10.3390/ijms26020673
- Graziano, S., Caldara, M., Gullì, M., Cornali, S., Vassura, I., Coralli, I., Pagano, L., Marmioli, M., Donati, M., Bevivino, A., Maestri, E., Keller, A.A., Marmioli, N. (2025) Improving the Sustainability of Tomato Production With Biochar and Biofertilizers in Emilia-Romagna, Italy. *Soil, Use and Management*, 2025; 41:e70091. doi:10.1111/sum.70091.
- Gullì, M., Cangioli, L., Frusciante, S., Graziano, S., Caldara, M., Fiore, A., Klonowski, A.M., Maestri, E., Brunori, A., Mengoni, A., Pihlanto, A., Diretto, G., Marmioli, N. (2025) The relevance of biochar and co-applied SynComs on maize quality and sustainability: Evidence from field experiments. *Science of the Total Environment* 968:178872 doi:10.1016/j.scitotenv.2025.178872
- Hao, Y., Ma, C., Cai, Z., Han, L., Jia, W., Cao, Y. White, J.C., Liang, A., Xu, X., Li, H., Chen, G., Xiao, J., Zheng, W., Pagano, L., Maestri, E., Marmioli, M., Marmioli, N., Zhao, J., Xing, B. (2025) Safe Production of Rice (*Oryza sativa* L.) in Arsenic-Contaminated Soil: a Remedial Strategy using Micro-Nanostructured Bone Biochar. *Environmental Science & Technology*
<https://doi.org/10.1021/acs.est.4c05040>
- Nolfi, L., Bindo, A., Di Gregorio, L., Costanzo, M., Caldara, M., Tabacchioni, S., Visca, A., Salo, T., Bauerle, A., Hansen, V., Bernini, R., Varese, G. C., Manikas, I., Marmioli, N., Palojarvi, A., Bevivino, A. (2025). Impact of Soil Improvers on Soil Health: A Data Mining Approach to Support Sustainable Agriculture Across the EU. *Environments*, 12(12), 472.
Doi:10.3390/environments12120472
- Pagano, L., Carlo, S., Lepore, G.O., Bonanni, V., Zizic, M., Pollastri, S., Margheri, S., Orsilli, J., Puri, A., Villani, M., Li, C., Aquilanti, G., Gianoncelli, A., D'acapito, F., Zappettini, A., Ma, C., White, J.C., Marmioli, N., Marmioli, M. (2025) Mechanistic understanding of iron oxide nanobiotransformation in *Zea mays*: a combined synchrotron-based, physiological and molecular approach. *Environmental Science: Nano* 12:4107-4121 doi: 10.1039/D5EN00401B
- Palermo, N., Vurro, F., Impollonia, G., Giovenali, G., Janni, M., Ceoloni, C. Marmioli, N. (2025) Durum wheat germplasm response to high temperatures the role of small HSP26 in the defense response. *Plant Science* 364, 112930 doi:10.1016/j.plantsci.2025.112930
- Caldara, M., Gullì, M., Graziano, S., Riboni, N., Maestri, E., Mattarozzi, M., Bianchi, F., Careri, M., Marmioli, N. (2024) Microbial consortia and biochar as sustainable biofertilisers: analysis of their impact on wheat growth and production. *Science of the Total Environment*, 238.
[10.1016/j.scitotenv.2024.170168]
- Iosa, I., Agrimonti, C., Marmioli, N. (2024) Real-Time PCR (qtPCR) to Discover the Fate of Plant Growth-Promoting Rhizobacteria (PGPR) in Agricultural Soils. *Microorganisms*, 12, 1002.
[10.3390/microorganisms12051002]
- Janni, M., Maestri, E., Gullì, M., Marmioli, M., Marmioli, N. (2024) Plant responses to climate change, how global warming may impact on food security: a critical review. *Frontiers in Plant Science*, 14:1297569 Doi: 10.3389/fpls.2023.1297569.
- Marmioli, M., Villani, M., Scarponi, P., Carlo, S., Pagano, L., Sinisi, V., Lazzarini, L., Pavlicevic, M., Marmioli, N. (2024) Green Synthesis of CuO Nanoparticles from macroalgae *Ulva lactuca* and *Gracilaria verrucosa*. *Nanomaterials*, 14:1157. <https://doi.org/10.3390/nano14131157>
- Palermo, N., Buffagni, V., Vurro, F., Impollonia, G., Pignone, D., Janni, M., Nguyen, H.T., Dembech, E., Marmioli, N. (2024) From landraces to haplotypes, exploiting a genomic and phenomic

- approach to identify heat tolerant genotypes within durum wheat landraces. *Environmental and Experimental Botany*, 228, 105986, doi: 10.1016/j.envexpbot.2024.105986
- Pavlicevic, M., Pagano, L., Villani, M., Zappettini, A., Paesano, L., Bonas, U., Marmioli, N., Marmioli, M., (2024) Comparison of effect of CdS QD and ZnS QD and their corresponding salts on growth, chlorophyll content and antioxidative capacity of tomato. *International Journal of Phytoremediation*, 26:6, 850-861, doi:10.1080/15226514.2023.2270692
 - Vogli, M., Peters, A., Wolf, K., Thorand, B., Herder, C., Koenig, W., Cyrus, J., Maestri, E., Marmioli, N., Karrasch, S., Zhang, S., Pickford, R. (2024) Long-term exposure to ambient air pollution and inflammatory response in the KORA study. *Science of the Total Environment*, 912:169416 Doi:10.1016/j.scitotenv.2023.169416
 - Marmioli, M., Birarda, G., Gallo, V., Villani, M., Zappettini, A., Vaccari, L., Marmioli, N., Pagano, L. (2023) Cadmium Sulfide Quantum Dots, Mitochondrial Function and Environmental Stress: A Mechanistic Reconstruction through In Vivo Approaches in *Saccharomyces cerevisiae*. *Nanomaterials* 13, 1944. Doi:10.3390/nano13131944
 - Paesano, L., Vogli, M., Marmioli, M., Bianchi, M. G., Bussolati, O., Zappettini, A., Marmioli, N. (2023). Cellular mechanisms of transcriptional regulation of human cell lines exposed to cadmium-based quantum dots. *Environmental Science: Nano* 10(4), 1177–1189. <https://doi.org/10.1039/d2en01044e>
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 - Pavlicevic, M., Elmer, W., Zuverza-Mena, N., Abdelraheem, W., Patel, R., Dimkpa, C., O'keefe, T., Haynes, C.L., Pagano, L., Caldara, M., Marmioli, M., Maestri, E., Marmioli, N., White, J.C. (2023) Nanoparticles and biochar with adsorbed plant growth-promoting rhizobacteria alleviate Fusarium wilt damage on tomato and watermelon. *Plant Physiology and Biochemistry*, 203:108052. <https://doi.org/10.1016/j.plaphy.2023.108052>
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 - Gallo, V., Serianni, V. M., Imperiale, D., Zappettini, A., Villani, M., Marmioli, M., Marmioli, N. (2022) Protein Analysis of *A. halleri* and *N. caerulescens* Hyperaccumulators When Exposed to Nano and Ionic Forms of Cd and Zn. *Nanomaterials*, 12(23):4236. <https://doi.org/10.3390/nano12234236>
 - Graziano, S., Caldara, M., Gullì, M., Bevivino, A., Maestri, E., Marmioli, N. (2022) A Metagenomic and Gene Expression Analysis in Wheat (*T. durum*) and Maize (*Z. mays*) Biofertilized with PGPM and Biochar. *International Journal of Molecular Sciences*, 23:10376 <https://doi.org/10.3390/ijms231810376>
 - Graziano, S., Agrimonti, C., Marmioli, N., Gullì, M. (2022) Utilisation and limitations of pseudocereals (quinoa, amaranth, and buckwheat) in food production: A review. *Trends in Food Science & Technology* 125:154-165. <https://doi.org/10.1016/j.tifs.2022.04.007>
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 - Caldara, M., Marmioli, M. (2021) Antimicrobial Properties of Antidepressants and Antipsychotics – Possibilities and Implications. *Pharmaceuticals* 14:915. Doi: 10.3390/ph14090915
 - Gallo, V., Zappettini, A., Villani, M., Marmioli, N., Marmioli, M. (2021) Comparative Analysis of Proteins Regulated during Cadmium Sulfide Quantum Dots Response in *Arabidopsis thaliana* Wild type and Tolerant Mutants. *Nanomaterials* 11:615. Doi: 10.3390/nano11030615
 - Lamastra, L., Baggio, T., Casu, G., Cominelli, F., Maestri, E., Marmioli, N., Mazzoni, E., Reguzzi, C., Spinelli, R., Voccia, D., Trevisan, M. (2021). From waste to resource: BLOWAFER project. *Environmental Engineering and Management Journal*, 20(10), 1661-1671.
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 - Pagano, L., Rossi, R., Paesano, L., Marmioli, N., Marmioli, M. (2021) miRNA regulation and stress adaptation in plants. *Environmental and Experimental Botany* 184:104369. Doi: 10.1016/j.envexpbot.2020.104369
 - Pavlicevic, M., Marmioli, N., Maestri, E. (2021) Immunomodulatory peptides—A promising source for novel functional food production and drug discovery. *Peptides* doi: 10.1016/j.peptides.2021.170696
 - Tabacchioni, S., Passato, S., Ambrosino, P., Huang, L., Caldara, M., Cantale, C., Hett, J., Del Fiore, A., Fiore, A., Schluter, A., Sczyrba, A., Maestri, E., Marmioli, N., Neuhoﬀ, D., Nesme, J., Sorensen, S.J., Aprea, G., Nobili, C., Presenti, O., Giovannetti, G., Giovannetti, C., Pihlanto, A., Brunori, A., Bevivino, A. (2021) Identification of Beneficial Microbial Consortia and Bioactive Compounds with Potential as Plant Biostimulants for a Sustainable Agriculture. *Microorganisms* 9, 426. Doi:10.3390/microorganisms9020426
 - Bianchi, M.G., Chiu, M., Taurino, G., Ruotolo, R., Marmioli, N., Bergamaschi, E., Cubadda, F., Bussolati, O. (2020) Pyrogenic and precipitated amorphous silica nanoparticles differentially affect cell responses to LPS in human macrophages. *Nanomaterials* 10(7):1395. DOI: 10.3390/nano10071395
 - Buffagni, V., Vurro, F., Janni, M., Gullì, M., Keller, A.A., Marmioli, N. (2020) Shaping durum wheat for the future: gene expression analyses and metabolites profiling support the contribution of BCAT genes to drought stress response. *Frontiers in Plant Science* 11:891 doi: 10.3389/fpls.2020.00891
 - Caldara, M., Marmioli, N. (2020) Known antimicrobials versus nortriptyline in *Candida albicans*: Repositioning an old drug for new targets. *Microorganisms* 8:742 doi:10.3390/microorganisms8050742
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- wheat varieties in triggering celiac disease: A multilevel in vitro, ex vivo and in vivo approach. *Nutrients* 12:3566 doi:10.3390/nu12113566
- Gallo, V., Srivastava, V., Bulone, V., Zappettini, A., Villani, M., Marmioli, N., Marmioli, M. (2020) Proteomic analysis identifies markers of exposure to cadmium sulphide quantum dots (CdS QDs). *Nanomaterials* 10:1214 doi:10.3390/nano10061214
 - Graziano, S., Marmioli, N., Gulli, M. (2020) Proteomic analysis of reserve proteins in commercial rice cultivars. *Food Science & Nutrition* 8:1788-1797 DOI: 10.1002/fsn3.1375
 - Graziano, S., Marmioli, N., Visioli, G., Gulli, M. (2020) Proteins and metabolites as indicators of flours quality and nutritional properties of two durum wheat varieties grown in different Italian locations. *Foods* 9:315 doi:10.3390/foods9030315
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 - Maestri, E., Marmioli, N. (2020) EU Food Integrity and Joining up the Landscape (EU Perspective). In: M. Burns, L. Foster, M. Walker (eds) *DNA Techniques to Verify Food Authenticity: Applications in Food Fraud*. Royal Society of Chemistry, pp. 283-295. ISBN 978-1-78801-178-5 (doi: 10.1039/9781788016025)
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