



*Curriculum vitae*

## **Emanuele De Paoli, PhD**

*(last update: December 2022)*

Emanuele De Paoli is Associate Professor of Agricultural Genetics in the Department of Agricultural, Food, Environmental and Animal Sciences (DI4A) of the University of Udine (Italy).

### **Expertise and main activities**

Dr. De Paoli is a plant genomics researcher and Associate Professor of Agricultural genetics with a molecular biology background. He specializes in plant epigenomics and bioinformatics with additional interests in structural genomics, genetic engineering, and genome editing. He contributed bioinformatic expertise in the field of small RNA biology and evolution as well as post-transcriptional regulation in *Arabidopsis*, *Petunia*, cereals and other crop species. He participated as a miRNA specialist in different plant genome projects involving crop species, crucial nodes of plant evolution and ecology-relevant plants. He is further developing his research in epigenomics by focusing on the characterization of mechanistic aspects of DNA methylation and the role of epigenetics in plant stress, genotype x environment interactions, genome organization and development. He was also involved in public and private funded projects for biopharming and metabolic engineering of plants and microorganisms where new genome editing and gene targeting technologies are applied. His laboratory management responsibilities and expertise include organizing, monitoring and performing activities in bioinformatics, molecular biology and genomics as well as plant and microorganism genetic transformation.

### **Academic and scientific career**

2002. MSc in Biological Sciences - University of Trieste (Italy). Final evaluation: 110/110 cum laude. Thesis: "Expression pattern and methylation analysis of a myelotropic-specific retroviral vector for gene therapy". Advisors: Prof. Mauro Giacca and Dr. Riccardo Priore – International Centre for Genetic Engineering and Biotechnology (ICGEB), Trieste, Italy.

2006. Ph.D. - Agricultural Sciences and Biotechnology - University of Udine (Italy). Dissertation: "Genetic diversity, linkage disequilibrium and repetitive component of the genome in Norway spruce [*Picea abies* L. (K.)]". Advisor: Prof. Michele Morgante.

2006. Postdoctoral Scholarship in Prof. Michele Morgante's laboratory at the University of Udine (Italy). Topic: conifer genomics. Activities: BAC sequencing, genomic annotation, bioinformatic analysis of transposable elements.

2007. Postdoctoral Scholarship in Prof. Pamela J. Green and Prof. Blake C. Meyers's laboratory at the University of Delaware & Delaware Biotechnology Institute (U.S.A.). Topic: 'Deep Sequencing of Plant Small RNAs' (National Science Foundation Grant #0638525 (to P.J.G. and B.C.M.)). Activities: high-throughput sequencing and bioinformatic analysis of small RNAs, RNA degradome and gene silencing in multiple plant species.



2010. Postdoctoral Scholarship in Dr. Azeddine Si-Ammour's laboratory at Istituto Agrario di San Michele all'Adige (IASMA) and Fondazione Edmund Mach (FEM) (Italy). Activities: high-throughput sequencing and bioinformatic analysis of small RNAs in apple and grapevine.

2011 to present. Research Scientist in Agricultural Genetics (SSD AGR/07) in the Department of Agricultural and Environmental Sciences (DISA), then Department of Agricultural, Food, Environmental and Animal Sciences (DI4A) of the University of Udine (Italy).

2013. Member of the Italian Society of Agricultural Genetics (SIGA).

2014. Visiting scientist in Prof. Vincent Colot's laboratory of Arabidopsis Epigenetics and Epigenomics at Institut de Biologie de l'École normale supérieure (IBENS), Paris (France). Activities: DNA methylation analysis, epigenomics of Arabidopsis.

2014. Granted tenure as Research Scientist in Agricultural Genetics (SSD AGR/07) in the Department of Agricultural, Food, Environmental and Animal Sciences (DI4A) of the University of Udine (Italy). Decree of the Rector n. 190 del 24 marzo 2015.

2014 to 2018. Faculty member of the PhD program in Molecular Biology of SISSA - Scuola Internazionale Superiore di Studi Avanzati (Trieste, Italy).

2017. National Scientific Qualification for the position of Associate Professor in Agricultural Genetics (Abilitazione Scientifica Nazionale - Settore Concorsuale 07/E1 - II Fascia - CHIMICA AGRARIA, GENETICA AGRARIA E PEDOLOGIA) through 10/04/2023.

2017-2019. Coordinator of the "Biotechnology and Genomics" branch of the Department of Agricultural, Food, Environmental and Animal Sciences (DI4A) of the University of Udine (Italy).

2017-2019. Member of the research board of the Department of Agricultural, Food, Environmental and Animal Sciences (DI4A) of the University of Udine (Italy).

2019 to present. Responsible for the Erasmus program within the Biotechnology curriculum at the University of Udine.

2022 to present. Appointment as Associate Professor of Agricultural Genetics in the Department of Agricultural, Food, Environmental and Animal Sciences (DI4A) of the University of Udine (Italy).

### **Scientific production (only indexed publication data are reported)**

Author/co-author of 29 Scopus-indexed publications which have produced 5504 total citations and an h-index of 18 (source: <https://www.scopus.com/authid/detail.uri?authorId=24553820800>, ORCID: <https://orcid.org/0000-0003-3646-7692>).



## Granted projects

2012-2016. "The control of plant root growth: a systems biology approach" (PRIN Italian funding program; coordinator Prof. Paolo Costantino, La Sapienza University, Rome). Role: responsible of research unit (small RNA and epigenomic analysis).

2016-2017. "Targeted genome editing in grapevine with CRISPR" (competitive intramural funding, University of Udine, Dept. of Agricultural, Food, Environmental and Animal Sciences). Role: principal investigator.

2017-2018. "ORACLE: Production of anti-TNFalpha in plant bioreactors" (competitive UE regional funding program POR-FESR 2014-2020; coordinator TRANSACTIVA Srl). Role: responsible of research unit (Development of gene targeting protocols for the improvement of transgenesis efficiency in rice).

## Participation to other funded projects

2013-2018. Novabreed (ERC; coordinator Prof. Michele Morgante, University of Udine). Role: team member, responsible for epigenomic analysis in grapevine.

2011-2018. Epigen (Italian Flagship Project; coordinator, Prof. Giuseppe Macino, La Sapienza University, Rome; responsible of research unit Prof. Michele Morgante). Role: collaborator, organization of sequencing services, small RNA and epigenomic analysis.

2014-2016 "Zostera marina genome project". (US-DOE/EU project; coordinator: Jeanine Onsel (University of Groningen). Role: non-beneficiary partner with expertise in Next Generation Sequencing analysis.

2014-2018. "The Epigenomic Plasticity of Grapevine in Genotype by Environment (GxE) Interactions" (FIRB, coordinator Dr. Silvia Dal Santo, University of Verona; responsible of research unit Dr. Cristian Del Fabbro). Role: team member. Project design and DNA methylation analysis.

2017-present. "Epidiverse - Linking Ecology, Molecular Biology and Bioinformatics in plant epigenetic research" (MSCA-ITN European Training Network (EU)). Role: project designer together with Prof. Michele Morgante (University of Udine and Institute of Applied Genomics (IGA), Udine, Italy) and Dr. Federica Cattonaro (IGA - Technology Services); PhD supervisor of a trainee enrolled in the Molecular Biology PhD program of Scuola Internazionale Superiore di Studi Avanzati (Trieste, Italy).

2018-2019. "Biomolecular-phenotypic characterization and incidence of *Legionella pneumophila* in Friuli Venezia Giulia" (Intramural PRID project at the University of Udine, Scientific coordinator: Prof. Marcello Civilini). Role: principal investigator of Legionella genomic analysis using Next Generation Sequencing.

2021 to present. "SeedForce. Using SEED banks to restore and reinFORCE the endangered native plants of Italy (LIFE20 NAT/IT/001468 Scientific coordinator: Dr. Costantino Bonomi, Museo delle Scienze, Trento). Role: Coinvestigator of genetic diversity by Next Generation Sequencing.



### Teaching - Bachelor/Master programs

2012 to present. Teaching appointment for the course of '**General Genetics**' to bachelor students of the Biotechnology curriculum at the University of Udine. The course includes 60-70 hrs per year of frontal lectures plus thematic seminars, full responsibility for grading students' performance in the class and student counseling.

2016 to present. Teaching appointment for the course '**Bioinformatic analysis of epigenetic data**' to master students of the Molecular Biotechnology curriculum at the University of Udine. The 30 hrs course is designed to provide bioinformatic competence to use analytic tools for genome arithmetic and advanced techniques for epigenomic analysis.

2019 to present. Teaching assistance for the course of '**Plant Breeding**' to master students of the Agricultural Sciences curriculum at the University of Udine.

2020. One-year teaching appointment for the module '**Molecular approaches and biotechnology for crop species**' within the course of '**Plant Breeding**' to master students of the Agricultural Sciences curriculum at the University of Udine. The 30 hrs course is designed to provide an overview of molecular breeding technologies including DNA sequencing and genetic engineering.

2021. Member of the committee for the reorganization of the Master program in "Molecular Biotechnology" (University of Udine, Italy, direct appointment from the program coordinator Prof. Bruno Stefanon).

2017 to present. Supervision (from experimental setup to data analysis, thesis writing and defence) of bachelor students and master students.

### Membership to PhD Boards and PhD student supervision

2014 to 2018. Faculty member of the PhD program in Molecular Biology of SISSA – Scuola Internazionale Superiore di Studi Avanzati, Trieste (Italy).

2019 to present. Member of the PhD Council for the PhD program in "Environmental Life Sciences" (University of Trieste, Italy) and for the PhD program in "Agricultural Sciences and Biotechnology" (University of Udine, Italy).

2013 to present. Ongoing supervision of a PhD student (Paloma Perez-Bello Gil, PhD program in Molecular Biology of SISSA (Scuola Internazionale Superiore di Studi Avanzati, Trieste, Italy)); Co-supervision of four PhD students, Dr. Mirko Celi and Dr. Monica Massaro within the PhD program in "Agricultural Sciences and Biotechnology" (University of Udine, Italy), Alessia Ronchi within the PhD program in "Environmental Life Sciences" (University of Trieste, Italy), Fiamma Bunello within the PhD program in "Agricultural Sciences and Biotechnology" (University of Udine, Italy).



### **Workshop organization**

2015. Co-organizer and speaker of the “On top of genetics workshop”, organized by Institute of Applied Genomics (IGA) and University of Udine within the international DEANN project on 22nd-23rd June 2015, Udine.

2016. Co-organizer and speaker of the “Bioinformatica per tutti, bioinformatica per tutto: genomica – epigenomica – trascrittomica” workshop (English translation: “Bioinformatics for everyone, Bioinformatics for everything: genomics – epigenomics - transcriptomics), organized by the Italian Society of Agricultural Genetics (SIGA) from 28th June to 1st July 2016.

2018. Co-organizer and speaker of the “Bioinformatica per tutti, bioinformatica per tutto: genomica – epigenomica – trascrittomica” workshop (English translation: “Bioinformatics for everyone, Bioinformatics for everything: genomics – epigenomics - transcriptomics), organized by the Italian Society of Agricultural Genetics (SIGA) from 4th June to 7th September 2018.

2021. Principal organizer of the workshop “Translating and Communicating Science” within the project Epidiverse - Linking Ecology, Molecular Biology and Bioinformatics in plant epigenetic research” (MSCA-ITN European Training Network (EU).

### **Outreach activities, collaborations, or consultant appointments with extra-moenia institutions or industry**

2016 to present. Ente Nazionale Risi. Role: setup of genomic approaches for rice variety determination, transfer of know-how for experimental setups and bioinformatic analysis of complex rice mixtures.

2017 to 2018. TMCI-Padovan S.P.A. Role: setup of genome editing approaches in bacteria species of industrial interest.

2019 to present. Member of the Scientific Board of Istituto di Genomica Applicata (Udine, Italy).

2018 and 2020. Advisor for Agence Nationale de la Recherche (Paris, France).

### **Membership to scientific societies**

2013 to present. Member of the Italian Society of Agricultural Genetics (SIGA)