







PERSONAL INFORMATION

Gianfranco Diretto



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 Manrico77 (Skype)
 Sex M | Date of birth 07/11/1977 | Nationality Italian

POSITION

Biotechnology Unit, Head
 Metabolomics facility, Head
 Research Scientist, ENEA (Italian National Agency for New Technologies, Energy and Sustainable Development), “Casaccia” Research Centre, Via Anguillarese 301, 00123 S.M. di Galeria (Rome), Italy

WORK EXPERIENCE

<p>From December 2008 to Present</p> <p>From 09/2005 – to 02/2006</p> <p>From 2007 to 2008</p> <p>From 04/2005 – to 06/2005</p> <p>From 01/2004 – to 06/2004</p> <p>From 01/2003 – to 12/2003</p>	<p>Research Scientist position at ENEA on “Metabolic/Genetic Engineering in Plant Field for Bio-pharmaceutical, Nutraceutical or Energetic Production”;</p> <p>Post-doc position at ENEA. Project: “Microarray and metabolic profiling of <i>Solanaceae</i> transcriptome and metabolome”;</p> <p>BIOGEN S.r.L. Collaboration Contract, at ENEA “CASACCIA” research centre on “Expression Profiling of transgenic plants of tomato (<i>Solanum lycopersicum</i>) with altered carotenoid content” (Advisor: Prof. Giovanni Giuliano);</p> <p>Farmen S.r.L. Collaboration Contract, performed at ENEA “Casaccia” Research Centre on “Metabolic engineering of carotenoid in transgenic tomato plants (<i>Solanum lycopersicon</i>)” (Advisor: Prof. Giovanni Giuliano);</p> <p>BIOGEN S.r.L. Collaboration Contract, at ENEA “Casaccia” Research Centre (S.M. di Galeria, Rome) on “Molecular characterization of tomato (<i>Solanum lycopersicon</i>) transgenic plants with altered carotenoid content” (Advisor: Prof. Giovanni Giuliano).</p>
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EDUCATION AND TRAINING

<p>May – June 2017</p> <p>May 2015 – February 2016</p> <p>November 2008</p>	<p>Visit to labs of Institut National Polytechnique de Toulouse. (Advisor: Prof. Mondher Bouzayen), Toulouse (France). Project: “Pharmacological treatments of tomato fruits with ABA and ABA inhibitor and antagonist”;</p> <p>Visit to labs of Instituto de Biología Celular y Molecular de Plantas (Advisor: Dr. Antonio Granell), Valencia (Spain). Project: “Use of cell cultures for secondary metabolite production and of GC-MS approaches for volatile analyses”;</p> <p>Visit to labs of Albert-Ludwigs University (Advisors: Prof. P. Beyer; Dr. S. Al-Babili), Freiburg (Germany). Project: “Biochemical</p>
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- May 2008

characterization of transgenic *Crt* leaf and tuber samples by HPLC of total carotenoids and LC-MS of ABA content;
- From April to December 2007
From May to December 2006

Period of study during the PhD program, performed at BTI for Plant Research/Cornell University (Advisor: Prof. J. Giovannoni), Ithaca, NY USA. Project: "Agronomical, molecular and physiological characterization of transgenic plants and mutants of tomato altered in carotenoid contents through microarray profiling, HPLC determination of carotenoids and post-harvest analyses";
- From 2003 to 2007

Joint PhD fellowship in Cellular and Molecular Biology, performed between ENEA Research Centre (Advisor: Prof. Giovanni Giuliano) and University of L'Aquila (Advisor: Prof. Laura Spanò); research project: "Metabolic Engineering of Xanthophyll Pathway Remodelling in *Iridaceae* and *Solanaceae*";
- From 1996 to 2002

First Class Degree (5 years) in Plant Biotechnology with full marks (110/110), Faculty of Biotechnological Science, University of Naples "Federico II"; research project: "Somatic embryogenesis and genetic transformation of *Rosa hybrida*";
- From 1990 to 1996

Secondary School Diploma (50/60), "Liceo Scientifico Statale F. Sbordone", Naples, Italy.

Professional Skills

- Agronomic techniques (fruit texture analysis; brix° determination; elasticity test of tomato cuticle; tomato crosses);
- Plant tissue culture (*in vitro* micropropagation; kanamycin test; cell cultures of rose; *in vitro* regeneration and *in vivo* (greenhouse) cultures of tobacco, potato, petunia, tomato and rose);
- Cytological techniques (determination of ploidy level in tobacco, petunia, potato and rose through direct (count of chromosomes in root apexes) and indirect (count of chloroplasts in the guard cells of the stomata) methods; determination of trichome number in potato);
- Plant genetic transformation (*Agrobacterium*-mediated transformation of tobacco, potato, petunia, tomato and rose; biolistic transformation of tobacco and rose; electrophoresis-mediated transformation of *R. canina* L. seeds; *A. tumefaciens* vacuum-infiltration of pepper and tomato flowers and fruits);
- Molecular Biology (binary and shooting vectors construction; *Escherichia coli* and *Agrobacterium tumefaciens* transformation by electroporation, CaCl₂ and thermal shock; *Escherichia coli* and *Agrobacterium tumefaciens* transformation by electroporation, CaCl₂ and thermal shock; extraction of plasmidic and plant genomic DNA; oligo design; PCR analysis; radioactive Southern blot analysis; extraction of total RNA; radioactive northern blot analysis; competitive PCR; RT-PCR; Real-Time PCR; Microarray analysis of tomato and potato rna by direct and indirect labelling);
- Biochemistry (spectrophotometer analysis of carotenoids, anthocyanins and ascorbic acid; TLC of total carotenoid content; HPLC-PDA-MS (APCI) of total isoprenoids and lipids; HPLC-ESI-MS of phytohormone content (ABA, Auxins, Cytokinins, Gibberellins, Salicylic Acid, Jasmonic Acid); LC-ESI-MS of polar metabolome; GC-MS of volatiles and semi-volatiles; extraction of total proteins; western blot analysis; ethylene determination by Gas-Chromatography (GC-FID); ACO enzymatic activity assay; LOX enzymatic activity assay; osmolarity analysis).

PERSONAL SKILLS

Mother tongue(s) Italian

Other language(s)

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C2	C2	C2	C2	C2
Spanish	B1	B1	B1	B1	B1

Communication skills	▪ good communication skills gained through my experience as personnel component.
Organisational / managerial skills	▪ leadership (currently responsible, as PI, for a team of 11 colleagues and students and, as Head of the Biotechnology Unit, for a group of 25 colleagues).
Job-related skills	▪ -
Computer skills	▪ good command of Mac OS, Windows and Microsoft Office™ tools; Statistical Programs (Systat); Graphic programs (Adobe Photoshop, Canvas); Bio-informatic programs (Blast, SwissProt, Mac-Vector, Assemblylign, Clustal W, Oligo 4.0, Primer Express 4.0, Amplify 1.2, Tmev 3.0, BioConductor, Consensus, Bioprospector, BioOptimizer, Patser, CREME, GeneOntology, Genespring 7.3, Kappaview 4.0, Genesis 4.0, MapMan 8.0, Cytoscape 2.6.3), Excalibur 1.3, SIEVE 2.0, Mass Frontier 1.5; Robin 2.0.
Other skills	▪ cooking; trip planner.
Driving licence	▪ B

ADDITIONAL INFORMATION

Patents	<ul style="list-style-type: none"> • “Una nuova carotenoide diossigenasi e metodi per la produzione biotecnologica in microorganismi e piante di composti ad elevato valore aggiunto derivati dallo zafferano” (“A new carotenoid dioxygenase and methods for the biotechnological production in microorganisms and plants of high value compounds from saffron”). Giuliano, G., Ferrante, P., Frusciante, S., Diretto, G., Pietrella, M., Al-Babili, S. 23/0714, n. RM2014A000415. • “Geni e metodi per la produzione biotecnologica e la compartimentalizzazione di apocarotenoidi a elevato valore aggiunto” (“Genes and methods for the biotechnological production and compartmentalization of high-value apocarotenoids”). Giuliano, G., Ferrante, P., Diretto, G., Aprea, G., Demurtas, O.C., Pietrella, M., Martinoia, E., Francisco, n. WO 2019/025935 A1.
Publications	<p>https://scholar.google.com/citations?user=m_FudvYAAAAJ&hl=it (110 records, Hi: 35)</p> <p>https://www.scopus.com/authid/detail.uri?authorId=14628122300 (95 records, Hi: 32)</p>
Oral Presentations	More than 20 presentations (5 as invited) at international conferences; more than 10 presentations at national conferences.
Scientific Services	Reviewer for more than 40 peer-review journals including PNAS, The Plant Journal, New Phytologist, Molecular Plant, BMC Plant Biology, Planta, Scientific report
Chair	<ul style="list-style-type: none"> - The 11th Solanaceae Conference, Porto Seguro, Brasil, November 2nd-6th 2014; co-chair session IV Phenotyping tools (Metabolomics); - PlantEngine COST ACTION FA1106 final meeting, Sorrento, Italy, April 15th-17th 2015; co-chair session I “Capturing secrets from nature”; - EUROCARTEN COST ACTION CA15136 workshop, Trogir, Croatia, October 16th-18th 2017; chair session III; - Gordon Research Conference on “Biology and Applications of Carotenoids, Retinoids and Other Apocarotenoids”, Ventura, USA, January 8th-13th 2023; chair session Biofortification and Biotechnology.
Honours and awards	<ul style="list-style-type: none"> • “Best Oral Presentation” at the 2nd Solanaceae Genome Workshop, Ischia (Na), Italy, September 25-29th, 2005; • “Natale Di Fonzo” SIGA 2011 Award for Genetic Breeding, LVI Italian Society of Agricultural Genetics – SIGA Annual Congress, Assisi (PG), Italy, September 19th-22th 2011.
Tutorship	• Master degree Thesis “Local Systems biology of tomato mutants altered in genes of the carotenoid biosynthesis” (2010-2011). Candidate: Sarah Frusciante; University of Rome “La Sapienza”, Rome, Italy, Faculty of Biotechnology;

- Master degree Thesis “Morphological, Molecular and Biochemical characterization of transgenic potato plants expressing the gene of the bacterial Phytoene desaturase (*CrtI*)” (2011-2012). Candidate: Maria Sulli; University of Rome “La Sapienza”, Rome, Italy, Faculty of Biotechnology;
- Master degree Thesis “Molecular and Metabolic characterization of tomato fruits expressing the ZCD gene of saffron” (2011-2012). Candidate: Antonio Miguel Garcia Condoluci; University of Rome “La Sapienza”, Rome, Italy, Faculty of Biotechnology;
- PhD Thesis “Dissection of carotenoid and apocarotenoid biosynthesis in crop plants” (2011-2013). Candidate: Sarah Frusciante; University of Rome “La Sapienza”, Rome, Italy, Faculty of Biotechnology;
- ENEA Post-doc fellowship “Metabolic Profiling of matrices of agri-food origin” (2018-2021). Candidate: Sarah Frusciante;
- Master degree Thesis “Molecular and biochemical characterization of tomato edited plants in β -carotene hydroxylase 1 and 2 (β -CHY1 e β -CHY2) involved in carotenoid biosynthesis” (2021-2022). Candidate: Carla Sandri; University Campus Bio-Medico, Rome, Italy;
- PhD Thesis “Investigation of apocarotenoid biosynthesis in physiological functions in crop plants” (2021-2023). Candidate: Dorotea Ricci; University Campus Bio-Medico, Rome, Italy;
- PhD Thesis “Investigation of genes involved in the synthesis and regulation of carotenoids and apocarotenoids in *Solanum lycopersicum*” (2023-2025). Candidate: Eleonora Fabene; University La Tuscia, Viterbo;
- PhD Thesis “Omics approaches to investigate the biosynthesis of novel plant apocarotenoids” (2024-2026). Candidate: Matteo Nava; University La Tuscia, Viterbo;
- PhD Thesis “Quality and safety of tomato and other Mediterranean crops” (2024-2026). Candidate: Upanshi Sharma; University La Tuscia, Viterbo.

PhD committee member

- PhD Thesis “Isolation and characterization of enzymes involved in the biosynthesis of secondary metabolites with phytotherapeutic interest” (July 5th, 2013). Candidate: Almudena Trapero Mozos; University of Castilla La-Mancha, Albacete, Spain, Faculty of Pharmacy;
- PhD Thesis “Molecular regulation of carotenoid biosynthesis in tomato fruits. New biotechnological alternatives” (July 25th, 2016). Candidate: Lucio D’Andrea; Centre for Research in Agricultural Genomics (CRAG), Barcelona, Spain;
- PhD Thesis “Genes and genomic regions related to the production of volatile compounds in the tomato fruit” (September 15th, 2016). Candidate: Jose Luis Rambla Nebot; University of Valencia, Spain, Department of Biotechnology;
- PhD Thesis “Identification and characterization of SITCP12, a new regulator associated with fruit ripening.” (January 16th, 2024). Candidate: Yushuo Gao; Institut National Polytechnique de Toulouse, France.

Teaching

Training course “Methodologies in Genomics and Metabolomics for the breeding of the horticultural crops”. February, 10th-14th 2014. University of Naples “Federico II”.

Projects

- 2005-2011: Italian Ministry of Education and Research, Special Fund for Basic Research: “Parallelomics: massively parallel transcriptional and metabolic profiling approaches for plant improvement” (Personell);
- 2006-2009: Italian Ministry of Education and Research, Special Fund for Industrial Research: “ITALYCO: Advanced biology for the improvement of Italian processing tomatoes” (Personell);
- 2006-2011: EC 6th FP: “High Quality Solanaceous Crops for Consumers, Processors and Producers by Exploration of Natural Biodiversity (EU-SOL)” (Personell);
- 2007-2010: EC 6th FP: “Development of High Throughput Approaches to Optimise the Nutritional Value of Crops and Crop-Based Foods (DEVELONUTRI)” (Personell);
- 2009-2013: EC 7° FP: “Development of tools and effective strategies for the optimisation of useful secondary METAbolite PROduction in planta (METAPRO)” (Personell);
- 2010-2012: “Improvement of nutritional and phytosanitary properties of commodities for human and animal nutrition (ALISAL)” (Personell);
- 2011-2014: AGER private consortium. “Durum wheat adaptation to global change: effect of elevated CO2 on yield and quality traits - DUJO” (Personell);
- 2011-2014: Italian Ministry of Agriculture. “Improvement of the utilization and digestibility of agricultural residues for biofuel production - BIOMASSVAL” (Personell);
- 2012-2015: Italian Ministry of Agriculture. “Italian-Israeli Initiative for the nutritional improvement of Solanaceous crops (IT-IL-NUTRI-SOL)” (Personell);
- 2013-2017: EC 7° FP “From DISCOvery to products: A next generation pipeline for the sustainable generation of high-value plant products (DISCO)” (Personnel);
- 2015-2018: H2020 “Traditional tomato varieties and cultural practices: a case for agricultural diversification with impact on food security and health of European population (TRADITOM)” (Personnel);

- 2018-2019 POR "Quality testing of organoleptic properties of COffee blends via genetic and METAbolic fingerprinting (COMETA)" (Team leader);
- 2018-2023: H2020 "Sustainable innovation of microbiome applications in food system (SIMBA)" (Personnel);
- 2019-2021: PON "Colture autoctone mediterranee e loro valorizzazione con tecnologie avanzate di chimica verde (COMETA)".
- 2020-2024: H2020 "Innovative high-value cosmetic products from plants and plant cells" (INNCOCELLS)" (Team leader).
- 2022-2024: PRIMA "Novel food products for the PROMotion of MEDiterranean LIFEstyle and healthy diet (PROMEDLIFE)" (Team leader);
- 2024-2026: Horizon "TWINNING COORDINATION FOR ENHANCED SCIENTIFIC CAPACITY IN WATER QUALITY, FOOD SAFETY, QUALITY AND TRACEABILITY BY USING INNOVATIVE APPROACHES (SPECTRA)" (Team leader);
- 2024-2026: Horizon Marie Skłodowska-Curie Actions Staff Exchange "Design of novel post-harvest technologies with low carbon footprint based on the discovery of active biomolecules (FRUITPRINT)" (Team leader).

Project evaluator

Evaluator for the PRIN (Progetti di Ricerca di Interesse Nazionale) 2021 edition; COST (European Union Europea), 2017; FONDECYT (Chilean Research Program), 2019; Spanish State Research Agency (AEI), 2019-2023; "Agritech" PNRR project evaluator (2024).

National scientific qualification as Full Professor (ASN)

Botany (05/A1), Level I (12/11/20 – 12/11/29); Plant Chemistry, Genetics and Pedology (07/E1), Level I (12/11/20 – 12/11/29).


Participation in Scientific Societies and Editorial boards

- Member of the Italian Society of Plant Genetics (SIGA);
- Guest Editor for the Special Issue on "Metabolic Engineering of Plants" for the journal "International Journal of Molecular Sciences (IJMS), 2020";
- Guest Editor for the Special Issue on "Advances in Tomato Breeding and Molecular Research" for the journal "International Journal of Molecular Sciences (IJMS), 2023";
- Topical Advisory Panel Member of the journal International Journal of Molecular Sciences (IJMS).

Organization of scientific meetings

- International Society for Plant Molecular Farming (ISPMF) meeting (120 participants). September 26th-28th 2022 Rome (Italy) (Organizing committee)
- ROXY COST Action CA18210 Group Meeting (15 participants). September 15th 2022 Rome (Italy) (Main Organizer).

Ai sensi del Decreto Legislativo 30 giugno 2003, n. 196 "Codice in materia di protezione dei dati personali" e del GDPR (Regolamento UE 2016/679), autorizzo il trattamento dei miei dati personali, conferiti nell'ambito della gestione del rapporto di lavoro con l'ENEA, in particolare per la nomina in qualità di componente degli organi di gestione negli enti partecipati.


Laboratorio Biotecnologie
SSPT-BIOAG-BIOTEC
Il Responsabile
Dr. Gianfranco Diretto