



CURRICULUM VITAE (CVA)

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Part A. PERSONAL INFORMATION

CV date	11/01/2022

First name	Francisco Javier		
Family name	Gallego Rodríguez		
Gender (*)	Male	Birth date (dd/mm/yyyy)	06/10/1966
Social Security, Passport, ID number	50711026M		
e-mail	fjgalleg@ucm.es	URL Web	
Open Researcher and Contributor ID (ORCID) (*)	0000-0002-9921-8960		

(*) Mandatory

A.1. Current position

Position	Profesor Titular (Associate Professor)		
Initial date	17/10/2011		
Institution	Universidad Complutense de Madrid		
Department/Center	Genetics, Physiology and Microbiology	Faculty of Biological Sciences	
Country	Spain	Teleph. number	+34913945043
Key words	Plant Genetics, Tree Genetics, Genomics, Abiotic Stress, Drought		

A.2. Previous positions (research activity interruptions, art. 14.2.b))

Period	Position/Institution/Country/Interruption cause
30/12/2005-16/10/2011	Profesor Contratado Doctor/UCM/Spain
24/11/2003-29/12/2005	Investigador Ramón y Cajal/UCM/Spain
27/10/2000-23/11/2003	Profesor Colaborador/Univ. San Pablo-CEU/Spain
06/10/1998-14/10/2001	Investigador contratado/INIA/Spain
17/02/1997-31/10/1997	Becario postdoctoral/IMIA-Comunidad de Madrid/Spain
01/04/1994-16/02/1997	Becario predoctoral/IMIA-Comunidad de Madrid/Spain
01/01/1991-31/12/1993	Becario predoctoral/UCM/Spain

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
PhD Biology	Universidad Complutense de Madrid/Spain	1997
Licensed Biology	Universidad Complutense de Madrid/Spain	1990

Part B. CV SUMMARY

1. Scientific merits.

Plant genetics and breeding captivated me when I was an undergraduate student of Biology. Thus, I did first a bachelor thesis on the **mapping of molecular markers** in cereals. Afterwards, I dedicated my PhD thesis to study the **genetic basis of aluminium tolerance** in rye (*Secale cereale*). During that time, we were able to discover the **genetic control of aluminum tolerance** in rye. In



addition, we mapped, for the first time, **two aluminum tolerance genes** in this species. As a result of these results, in addition to the high-impact publications, I was able to obtain an academic award (**Premio extraordinario de doctorado, UCM**).

At the end of my thesis my interest in the emerging area of **genomics** began. I was able to get a researcher contract at INIA (Department of Biotechnology) to collaborate in research in **plant molecular biology** (Dr. F. Ponz). We were committed to approach **genomic tools to the agri-food sector (R&D)**. We developed different molecular marker panels (SSRs, AFLPs, etc.) to analyze the genomes of several crops. Then, we established molecular systems for the **analysis, protection and conservation of genetic resources**.

Exciting advances in **massive sequencing technologies** led me to move to a leading group with Prof. S. Kresovich, at Cornell University (USA) to deepen in this field. At the Center of Genome Diversity, I had the opportunity to learn about and use the emerging technologies of **massive sequencing and bioinformatic analysis** to study crop genomes. In this way we were able to create new databases and bioinformatics systems for the analysis and management of germplasm collections in cereals. Specifically, we generated a **molecular DB to characterize and conserve shorgum resources**.

Then, thanks to a Ramón y Cajal contract, I was able to join the Department of Genetics at UCM to resume the study of the **response of cereals to abiotic stresses with new genomic approaches**. My first independent research focused on studying various aluminum tolerance genes in different species of cereals. We identified, **cloned and characterized two organic acid transporters** (scALMT-1 and scMATE-1) involved in plant tolerance to acid soils. Moreover, we were able to disentangle **the role of flavonols** in this response. Finally, we could identify and functionally **characterize a transcription factor** (scSTOP-1) that controls the expression of ALMT and MATE genes. Subsequently, a similar genetic system of response to acid soils have been described in many other plant species.

About ten years ago I began to be interested in **climate change scenario, and its effect on plants**. I was convinced that a **phenomenon as complex as this required a multidisciplinary approach** in which genomic tools have much to contribute. Moreover, I moved on to study **the effect of climate change on forest species**. From that moment I began to participate in a emerging **collaborative project** with geographers, ecologists and physiologists. In this time, we have been able to analyze the genetic mechanisms of adaptation to drought stress. We have become interested in species of different genera such as **Pinus, Cedrus or Abies**, and in which genomic resources are currently very scarce. We are studying the phenomenon, with two global approaches. In one hand, **structural genomics** (Genotyping By Sequencing, GBS) has allowed us to characterize variability in natural populations threatened by warming, and to **identify selection traces associated with drought mortality**. On the other hand, via **RNA-seq**, we have characterized global gene response in this context. Besides, we have been able to detect **significant differences in the gene expression profiles between drought-tolerant and -sensitive individuals**. Some promising **gene candidates** have been identified.

With all that, my research has evolved to consider plant (tree) stress response in increasingly complex frameworks, which logically should culminate in taking into account **the role of epigenetics in the observed phenotypic plasticity**, as we propose here. My extensive accumulated research experience places me in a unique position to undertake this task in this project.

The consequence of the work carried out during these years has been the **publication of 48 scientific articles** in high-impact journals indexed in SCI, as well as **8 scientific dissemination articles** and **2 book chapters**. Additionally, we have presented numerous communications to national and international congresses.

On the other hand, the results of my research have been disseminated in different conferences and seminars. In addition, I have participated as professor in **4 international training courses for trainers (AECI-INIA)**, in which I have been able to disseminate my scientific advances to numerous researchers in the area.

Over the years, I have participated in **25 R&D projects financed in public calls**, and in **5 research contracts**, being **IP in 3 of those projects**. I would like to stress the difficulty that my decision to move from cereal genetics to forest genetics has entailed in my scientific career. This change has involved a considerable effort and difficulties, and generated a two-year gap in the financial support of my research.

My scientific career and current expertise has been possible thanks to a **strong collaborative network**. I have collaborated and collaborate with many scientists from Spain and abroad, including



M. Matos (Universidade de Trás-os-Montes e Alto Douro, Portugal), S. Kresovich (Univ. Cornell, USA), P. Ryan and M. Delhaize (CSIRO Agriculture and Food, Australia), A. Aniol (IHAR, Poland), G. Fontecha (UNAH, Honduras), C.R. Clement (INPA, Brasil), A.S. Jump (University of Stirling, Scotland), Jill Wegrzyn (Univ Connecticut, USA) and J. Maloof (Univ. California-Davis, USA).

In summary, the research experience during these years allows me today to have a considerable **capacity to study complex traits with a genomic and molecular biology approach**, as well as to carry out the necessary bioinformatic analyses. For this reason, I believe that I can contribute with my scientific and technological capabilities to multi-disciplinary teams like the one we are forming in this project.

2. Contributions to society, such as technological development and innovation activities.

As proof of my involvement in the scientific transfer of research to society, I recently obtained a **“sexenio de transferencia”**. Throughout these years I have participated in **5 contracts with companies** providing genomic analysis services for the conservation or protection of genetic resources. Moreover, during my postdoctoral period at INIA I was **responsible for the Molecular Marker Unit**, serving the agri-food sector, both researchers and companies in the field.

On the other hand, I am committed to disseminate science to society. Therefore, I participate every year with two activities in the **Week of Science**, and regularly collaborate on the **Researchers' Night**. In addition, I have collaborated in numerous **courses on genomics or plant biotechnology** both to technical personnel of public organizations (Ministry of Agriculture and INIA) as well as to teachers of secondary schools.

3. Contributions to the training of young scientists and evaluation activities.

I have supervised **5 PhD students** that have successfully obtained their doctorate (plus 2 ongoing). All the students were **funded through competitive Spanish or international programmes**, and are currently continuing a successful scientific career. Additionally, I have supervised **9 master students**, (plus 1 ongoing).

I have reviewed numerous articles in a large array of SCI journals. I **evaluate research projects** in national and international calls. I also **evaluate projects for a private certification company** (DNV). Besides, I have collaborated in the **evaluation of young scientists** at the Juan de la Cierva Programme.

4. Other contributions.

- **Vice-Dean for Grade** at Faculty of Biology (UCM) (2018-2021).
- **Academic book: Genomics and Proteomics** (Gallego FJ, Fernández A, Ed. Síntesis, 2019).

C.1. Publications

1. Abd El-Moneim, D., Contreras, R., Silva-Navas, J., **Gallego, F.J.**, Figueiras, A.M., Benito, C. (2022). "Repression of Mitochondrial Citrate Synthase Genes by Aluminum Stress in Roots of *Secale cereale* and *Brachypodium distachyon*." *Frontiers in Plant Science* 13(832981).
2. García-García, I., Méndez-Cea, B., Martín-Gálvez, D., Seco, J.I., **Gallego, F. J.**, Linares, J. C. (2022). "Challenges and Perspectives in the Epigenetics of Climate Change-Induced Forests Decline." *Frontiers in Plant Science* 12(3207).
3. Silva-Navas, J., Salvador, N., del Pozo, J. C., Benito, C., **Gallego, F. J.** (2021). "The rye transcription factor ScSTOP1 regulates the tolerance to aluminum by activating the ALMT1 transporter." *Plant Science* 310.
4. Cobo-Simón, I., Méndez-Cea, B., Seco, J. I., Wegrzyn, J., Linares, J. C., **Gallego, F. J.** (2021). "Gene frequency shift in relict abies pinsapo forests associated with drought-induced mortality: Preliminary evidence of local-scale divergent selection." *Forests* 12(9).
5. Cobo-Simón, I., Méndez-Cea, B., Jump, A. S., Seco, J., **Gallego, F. J.**, Linares, J. C. (2020). "Understanding genetic diversity of relict forests. Linking long-term isolation legacies and current habitat fragmentation in *Abies pinsapo* Boiss." *Forest Ecology and Management* 461.
6. Méndez-Cea, B., Cobo-Simon, I., Perez-Gonzalez, A., Garcia-Garcia, I., Linares, J.C., **Gallego, F.J.** (2019). "DNA extraction and amplification from Pinaceae dry wood." *Silvae Genetica* 68(1): 55-57.

7. Pérez-González, A., Marconi, M., Cobo-Simón, I., Méndez-Cea, B., Perdiguero, P., Linacero, R., Linares, J. C., **Gallego, F. J.** (2018). "Abies pinsapo Boiss. Transcriptome Sequencing and Molecular Marker Detection: A Novel Genetic Resources for a Relict Mediterranean Fir." *Forest Science* 64(6): 609-617.
8. Salvador-Moreno, N., Ryan, P. R., Holguín, I., Delhaize, E., Benito, C., **Gallego, F. J.** (2018). "Transcriptional profiling of wheat and wheat-rye addition lines to identify candidate genes for aluminum tolerance." *Biologia Plantarum* 62(4): 741-749.
9. Silva-Navas, J., Moreno-Risueno, M. A., Manzano, C., Del Pozo, J. C. **(8/9)** (2016). "Flavonols mediate root phototropism and growth through regulation of proliferation-to-differentiation transition." *Plant Cell* 28(6): 1372-1387.
10. Silva-Navas, J., Moreno-Risueno, M. A., Manzano, C., Del Pozo, J. C. **(9/10)** (2015). "D-Root: A system for cultivating plants with the roots in darkness or under different light conditions." *Plant Journal* 84(1): 244-255.
11. Silva-Navas, J., Benito, C., Téllez-Robledo, B., Abd El-Moneim, D., **Gallego, F. J.** (2012). "The ScaACT1 gene at the Q alt5 locus as a candidate for increased aluminum tolerance in rye (*Secale cereale* L.)." *Molecular Breeding* 30(2): 845-856.

C.2. Congress

1. Cobo-Simón I, **Gallego FJ**, Linares JC. Oral Presentation. Climate change-related shifts in the genetic diversity of relict tree species: understanding the patterns of molecular markers in *Abies pinsapo*. (2018). IBS Climate Change Biogeography Meeting, March 20-24, Évora, Portugal.
2. Cobo-Simón I, Linares JC, **Gallego FJ**. Oral Presentation. Breaking the wall of trees and climate change. (2017) Falling Walls, Sept 21, Madrid, Spain.
3. Pérez-González A, Marconi M, Perdiguero P, Cobo-Simón I, Méndez-Cea B, Linacero R, **Gallego FJ**. Oral Presentation. De novo transcriptome assembly and molecular marker detection in spanish fir (*Abies pinsapo*). (2016) IUFRO Genomics and Forest Tree Genetics, May 30 – June 3, Arcachon, France.

C.3. Research projects

1. PAIDI, P18-RT-1170. Conservación de pinsapares degradados en la Reserva de la Biosfera intercontinental del Mediterráneo: un enfoque eco-genómico para evaluar el potencial adaptativo al cambio global de especies forestales amenazadas. Junta de Andalucía. Anass Terrab (Universidad de Sevilla). 12/02/2020-31/12/2023. 108.000 €. Researcher.
2. RTI2018-096884-B-C33. Legacy effects of environmental conditions and management on tree drought sensitivity: a dendrogenomic approach into adaptation to climate change. Ministerio de Ciencia, Innovación y Universidades. Juan Carlos Linares Calderón (Universidad Pablo de Olavide). 01/01/2019-31/12/2022. 200.860 €. Co-IP.
3. LMP242_18. Diversidad funcional de suelos en ecosistemas forestales cambiantes. Gobierno de Aragón. Jesús Julio Camarero (CSIC). 01/01/2019-31/12/2020. 85.329 €. Researcher.
4. CGL2013-48843-C2-2-R. Presiones selectivas del cambio climático sobre la ecofisiología y la estructura genética de árboles y comunidades microbianas del suelo en ecotonos forestales. Juan Carlos Linares (Universidad Pablo de Olavide). 01/01/2014-31/12/2018. 162.140 €. Researcher.

C.4. Contracts, technological or transfer merits

1. Pingarrón JM, Campuzano Susana, **Gallego FJ**, Linacero R, Ruiz-Valdepeñas V. ES2637232. Método y kit para detectar y/o cuantificar la presencia de ADN de caballo en muestras aisladas. Spain. 21/06/2017. UCM. Not in exploitation.
2. del Pozo JC; **Gallego FJ**; Silva-Navas J. ES1091883. Dispositivo para el crecimiento de raíces en cultivos in vitro. Spain. 19/08/2013. INIA (50%) and UCM (50%). Not in exploitation.