MINISTERIO DE CIENCIA E INNOVACIÓN

Cofinanciado por la Unión Europea

AGENCIA ESTATAL DE INVESTIGACIÓN

CURRICULUM VITAE (CVA)

CV date	07/07/2023

Part A. PERSONAL INFORMATION

First name	Francisco Javier		
Family name	Gallego Rodríguez		
e-mail	fjgalleg@ucm.es	URL Web	
Open Researcher and Contributor ID (ORCID) (*)		0000-0002-9921-8960	

A.1. Current position

Position	Catedrático de Universidad (Full Professor)		
Initial date	25/11/2022		
Institution	Universidad Complutense de Madrid		
Department/Center	Genetics, Physiology and Microbiology	Faculty of Biological Sciences	
Country	Spain	Teleph. number	+34913945043
Key words	Plant Genetics, Conservation Genetics, Genomics, Abiotic Stress, Drought		

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

Period	Position/Institution/Country/Interruption cause
17/10/2011-24/11/2022	Profesor Titular
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 52 scientific articles** in high-impact journals indexed in SCI, as well as **11 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 **27 R&D projects financed in public calls**, and in **5 research contracts**, being **IP in 5 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

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 as well as to teachers of secondary schools.

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

I have supervised **6 PhD students** that have successfully obtained their doctorate (plus 1 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).

- Publications (5 years)

1. García-García I, Méndez-Cea B, González de Andrés E, Gazol A, Sánchez-Salguero R, Manso-Martínez D, Hórreo JL, Camarero JJ, Linares JC, **Gallego FJ**. "Climate and soil microsite conditions determine local adaptation in declining silver fir forests". Plants, 2023, in press.
2. Méndez-Cea B; García-García I; Sánchez-Salguero R; Lechuga V; **Gallego FJ**; Linares JC (2023). "Tree-Level Growth Patterns and Genetic Associations Depict Drought Legacies in the Relict Forests of Abies marocana". Plants, 12(4), 873
3. Méndez-Cea, B., García-García, I., Gazol, A., Camarero, J.J., González de Andrés, E., Colangelo, M., Martín-Gálvez, D., Valeriano, C., **Gallego, F.J**., Linares, J.C. (2023). "Race pace matters: uncoupled genetic variability and phenotype patterns in edge tree populations." Science of the Total Environment, 858 (2): 159778.
4. Cobo-Simón, I., Maloof, J.N., Li, R., Amini, H., Méndez-Cea, B., García-García, I., Gómez-Garrido, J., Esteve-Codina, A., Alioto, T., Wegrzyn, J., Seco, J.I., Linares, J.C., **Gallego, F.J**. (2022). "Contrasting transcriptomic patterns reveal genomic basis for drought resilience in the relict fir Abies pinsapo Boiss." Tree Physiology, tpac115.
5. 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).
6. 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).
7. 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).

8. 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.
9. Cobo-Simón, I., J. Márquez-Rodríguez, B. Méndez-Cea, **F. J. Gallego** and M. Pérez-Fernández (2020). "Understanding the morphological and genetic distinctiveness of the Spanish pouter pigeons: the Marchenero Pouter as a case study." Ibis 162(3): 766-777.
10. 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.
11. Mendez-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.
12. Cobo-Simón, I., B. Méndez-Cea, H. Portillo, F. Elvir, H. Vega, **F. J. Gallego** and G. Fontecha (2019). "Testing the effectiveness of conservation management within biosphere reserves: the case of the Mexican deer mouse (Peromyscus mexicanus) as a bioindicator." Integrative Zoology 14(5): 422-434.
13. 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.
14. 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.
15. Santos, E., C. Benito, J. Silva-Navas, **F. J. Gallego**, A. M. Figueiras, O. Pinto-Carnide and M. Matos (2018). "Characterization, genetic diversity, phylogenetic relationships, and expression of the aluminum tolerance MATE1 gene in Secale species." Biologia Plantarum 62(1): 109-120.

- Research projects

1. PID2021-123675OB-C44. IBerian FORest responses to climate change across spatio-temporal scales: hotspots and roles of structural and functional RESilience (IB-ForRes)- UCM-UPO. IPs: Raúl Sánchez; Francisco Javier Gallego. 01/09/2022 - 31/12/2024. 229.900 €. Co-IP.
2. TED2021-129770B-C22. Multifunctional evaluation of post-dieback recovery to forecast and mitigate the impact of drought on forests (TRANSILVA). UCM-UPO. IPs: Raúl Sánchez; Francisco Javier Gallego. 01/01/2022 - 31/12/2023. 240.000 €. Co-IP.
3. 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.
4. 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.
5. 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.
6. 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.

- 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.