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Plan de Recuperación,  
Transformación y  
Resiliencia



AGENCIA  
ESTATAL DE  
INVESTIGACIÓN

CV date	01/08/2023
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## Part A. PERSONAL INFORMATION

First name	Francisco	
Family name	García García	
Gender (*)	Male	
ID number	52704795L	
e-mail	fgarcia@cipf.es	URL Web: <a href="https://bioinfo.cipf.es/ubb/">https://bioinfo.cipf.es/ubb/</a>
Open Researcher and Contributor ID (ORCID) (*)	0000-0001-8354-5636	

### A.1. Current position

Position	Research group leader		
Initial date	01/02/2018		
Institution	Fundación CV Centro de Investigación Príncipe Felipe (CIPF)		
Department	Computational Biomedicine		
Country	Spain	Teleph. number	+34 96 328 96 80
Key words	Bioinformatics, Personalized Medicine, Sex Differences, Cancer, Rare Diseases, Neurodegenerative Diseases, Drug Repurposing, Biomarkers, Artificial Intelligence, Big Data, Meta-Analysis, Digitalization, Medical Imaging, Environmental Pollution		

### A.2. Previous positions

Period	Position/Institution/Country/Interruption cause
01/09/2007-31/01/2018	Researcher at CIPF (Spain)
01/12/2012-31/10/2015	Associate Lecturer at Universidad Politécnica de Valencia (Spain)
01/09/2009-31/01/2012	Associate Lecturer at Universitat de València (Spain)

### A.3. Education

PhD, Licensed, Graduate	University	Year
PhD Biotechnology and Biomedicine	Universitat de València	2016
Master in Biostatistics	Universitat de València	2012

## Part B. CV SUMMARY

Since 2018, Francisco García has been the principal researcher of the Computational Biomedicine laboratory (CB), in the Principe Felipe Research Center (CIPF). His research activity is focused on the development of new methods and computational resources to improve the characterization of the molecular bases in human diseases. The **CB's** lines of research are 1) the identification of novel biomarkers and the development of clinical predictors in neuronal diseases and cancer, based on data from high-throughput technologies (omics and medical imaging) and Artificial Intelligence methods, and 2) the study of sex differences in biomedical studies using computational approaches.

He has developed his professional and research career in various biomedical and health institutions (Spanish National Bioinformatics Institute, CIBER Rare Diseases, Health Departments in Generalitat Catalunya and Generalitat Valenciana, and Principe Felipe Research Center), whose objective has been the processing, analysis and integration of large volumes of data to generate relevant and useful information to provide solutions to biological, epidemiological and clinical problems.

Francisco García has been teaching continuously since 2006, participating as a university lecturer in undergraduate and master's degrees at numerous universities. Since 2018 he has been a member of the academic committee of the Master's in Bioinformatics at the University of Valencia. He has also



participated in more than 70 national and international training activities in Biostatistics, Bioinformatics, Computational Genomics and Personalized Medicine. He has supervised 43 master students and 10 PhD Thesis (ongoing).

Summary of scientific and technical activities:

- Six-year research periods: 2011-2016 and 2017-2022.
- He is a member of the board of directors of the new SEBBC (Spanish Society for Bioinformatics and Computational Biology).
- His laboratory is part of the TransBioNet network of bioinformatics units associated with health research, which aims to promote Bioinformatics with the Spanish health system.
- He has been the coordinator of the Valencian node of the National Institute of Bioinformatics (INB): 2019- 2021.
- Member of the evaluation panels for biomedical R+D+I projects in **a)** European Health and Digital Executive Agency (HaDEA), HORIZON-HLTH-2023-DISEASE; **b)** ERA PerMed, “Multidisciplinary research projects on personalised medicine - development of clinical support tools for personalised medicine implementation”; **c)** Coordination and Evaluation Subdivision (AEI, Agencia Estatal de Investigación), and **d)** Andalusian Public Foundation for Progress and Health (FPS). Regional Government of Andalusia.
- He participates as a reviewer in the scientific journals: "Bioscience, Biotechnology, and Biochemistry", "Bioinformatics", "BMC Genomics", "Biology Direct", "Genes", "NAR", and "Orphanet Journal of Rare Diseases".
- Since 2020, he has also been a member of the committee of reviewers for the European Conference on Computational Biology (ECCB).
- His unit is integrated into various joint research units with the aim of promoting synergies between entities such as **1)** the Valencian Institute of Oncology, **2)** the Foundation for the Promotion of Health and Biomedical Research of the Valencian Community (FISABIO), **3)** Inst. de Investigación Sanitaria “La Fe”, and **4)** the University of Valencia, with whom he has been forming the Joint Unit on Biomedical Research with a Gender Perspective since 2018.
- Member of Committee on Animal Research and Ethics, in CIPF since 2018.
- His team is involved in several international research collaborations in Japan, USA, Argentina and European consortia.
- Participation in the Mentoring Program for International Female Scholars. University of Cologne. Germany. 2021-2022.

## Part C. RELEVANT MERITS

**C.1. Scientific papers: 60 in the last 10 years** (source: [PubMed](#)). 10 selected publications (\*corresponding author)

1. JF Català-Senent, Z Andreu, FJ Roig-Molina, F García-García\* (10/10). *A deep transcriptome meta-analysis reveals sex-based molecular differences in Multiple Sclerosis*. Neurobiol Dis. 2023 Apr 5;181:106113. doi: 10.1016/j.nbd.2023.106113.
2. C Perpiñá-Clérigues, S Mellado, F García-García\*, M Pascual\* (9/10). *Lipidomic Landscape of Circulating Extracellular Vesicles Isolated from Adolescents Exposed to Ethanol Intoxication: A Sex Difference Study*. Biology of Sex Differences 2023 Apr.
3. M Guaita-Cespedes, R Grillo-Risco, MR Hidalgo, F García-García\* (8/8). *Deciphering the Sex Bias in Housekeeping Gene Expression in Adipose Tissue: A Comprehensive Meta-analysis of Transcriptomic Studies*. Biology of Sex Differences 2023 Apr.
4. A López-Cerdán, Z Andreu, MR Hidalgo, R Grillo-Risco, JF Català-Senent, I Soler-Sáez, A Neva-Alejo, F Gordillo, M de la Iglesia Vaya, F García-García\* (10/10). *Unveiling sex-based differences in Parkinson Disease: a comprehensive meta-analysis of transcriptomic studies*. Biology of Sex Differences 2022 Nov 22;13(1):68. PMID: 36414996.
5. I Pérez-Díez, MR Hidalgo, P Malmierca-Merlo, F García-García\* (10/10). *Functional signatures in non-small-cell lung cancer: a systematic review and meta-analysis of sex-based differences in transcriptomic studies*. Cancers 2021, 13(1), 143; PMID: 33526761.
6. JF Català-Senent, MR Hidalgo, M Berenguer, G Parthasarathy, H Malhi, P Malmierca-Merlo, M de la Iglesia-Vayá, F García-García\* (8/8). *Hepatic steatosis and steatohepatitis: a*

- functional meta-analysis of sex-based differences in transcriptomic studies*. Biology of sex Differences. 12 - 1, pp.1 - 12. BioMed Central, 2021. PMID: 33766130.
- Casanova Ferrer F, Pascual M, Hidalgo MR, Malmierca-Merlo P, Guerri C, García-García F\* (6/6). *Unveiling Sex-Based Differences in the Effects of Alcohol Abuse: A Comprehensive Functional Meta-Analysis of Transcriptomic Studies*. Genes (Basel). 2020 Sep 21;11(9).
  - García-García F, Panadero J, Dopazo J, Montaner D (1/4). Integrated gene set analysis for microRNA studies. Bioinformatics. 2016 Sep 15;32(18). PMID: 27324197.
  - Alemán A, García-García F, Salavert F, Medina I, Dopazo J (2/5). *A web-based interactive framework to assist in the prioritization of disease candidate genes in whole-exome sequencing studies*. Nucleic Acids Res. 2014 Jul;42:W88-93. PMID: 24803668.
  - Alemán A, García-García F, Medina I, Dopazo J (2/4). *A web tool for the design and management of panels of genes for targeted enrichment and massive sequencing for clinical applications*. Nucleic Acids Res. 2014 Jul;42:W83-7. PMID: 24861626.

## C.2. Congress and invited talks

- **137 contributions between 2013-2023 (57 international contributions)**. Selected contributions in 14th international meeting of the Organization for the Study of Sex Differences, May 3-6, 2021, US: **1) Big data approaches to detect and understand sex/gender differences in Health**. F García-García. **2) Unveiling sex-based differences in Parkinson disease: a comprehensive functional meta-analysis of transcriptomic studies**. A López-Cerdán, F García-García. **3) Sex-based Differences in Multiple Sclerosis: A Systematic Review and Meta-Analysis of transcriptomic studies**. JF Català-Senent, F García-García. **4) Functional signatures in Alzheimer disease: systematic review and meta-analysis of sex-based differences in transcriptomics studies**. A López-Cerdán, F García-García.
- **58 invited talks** in 2013-2023.

## C.3. Research projects (2017-2023)

- DifNerOmics: "Study of sex differences in neurodegenerative diseases with integrative approaches of omics data and biomedical imaging"**. PID2021-124430OA-I00. Proyectos de Generación de Conocimiento. Ministerio de Ciencia e Innovación. 2022-2025. 157,300 €. PI: F García-García.
- Sex differences in Parkinson's disease through meta-analysis and integration of microbiome, transcriptome and biomedical imaging studies**. ACIF/2021/221 Predoctoral grant. Conselleria d'Innovació, Universitats, Ciència i Societat Digital. Generalitat Valenciana. 2022-2026. 93,000 €. PI: F García-García.
- Characterising sex differences in multiple sclerosis disease through meta-analysis and integration of biomedical imaging, transcriptome and microbiome**. FPU20/03544 Predoctoral grant. Mº de Universidades. 2021-2025. 94,000 €. PI: F García-García.
- "The Future of Biomedical Research (FBR) CIPF lecture series"**. CIAORG/2022/35. Subvenciones para la organización y difusión de congresos, jornadas y reuniones científicas. Generalitat Valenciana. 9,000 €. PI: F García-García.
- Nanoplataforma Polipeptídica Multimodal de Precisión para el Tratamiento y Monitorización de Tumores Metastásicos. Pol@Mets**. MFA/2022/065. Conselleria de Innovación, Universidades, Ciencia y Sociedad Digital. Generalitat Valenciana. Programa de I+D+i de materiales avanzados. 269,825 euros. PI: M. Jesús Vicent Docón. Researcher at CIPF: F García García.
- IMPACT: Infraestructura de Medicina de Precisión asociada a la Ciencia y Tecnología**. IMP/00019. Instituto de Salud Carlos III. Ministerio de Ciencia, Innovación y Universidades. 01/01/2021-31/12/2023. 4,549,380 €. PI at CIPF: F García-García.
- New players in human BAT differentiation and activation: a human PSC-derived BAT approach combined with state of the art genome engineering and -omics based methodologies (StemBAT)**. Advanced Grant 669879 ERC. 01/01/2016-30/06/2023. 346,869€. PI: Antonio Vidal-Puig. Researcher at CIPF: F García García.
- DifGenOmics: Study of sex and gender differences in health with omic approaches**. GV/2020/186. Generalitat Valenciana. Projects I+D+I emerging research groups. 01/01/2020-31/12/2021. 15,500 €. PI: F García-García.
- Bioinformatics Platform. The Spanish National Bioinformatics Institute (INB)**. Coordinator: A Valencia. PT17/0009/0015. 01/01/2018-31/12/2020. 31,899.99 €. Head researcher at CIPF: F García-García.

10. **Aid to diagnosis, prognosis and triage of COVID19 patients by applying Artificial Intelligence to clinical-radiological data.** Coordinator: M de la Iglesia. Conselleria de Innovación, Univ., Ciencia y Sociedad Digital. Generalitat Valenciana. 11/04/2020-31/12/2020. 100,000 €. Researcher at CIPF: F García-García.
11. **Biomarkers for precision oncology in lung, colorectal and melanoma cancer.** Agencia Valenciana de Innovación. PI: J Forteza. 31/07/2018-31/12/2018. 100,000 €. Researcher: F García-García.

#### **C.4. Contracts, technological or transfer merits**

1) Detection of immune profiles in inflammatory skin diseases. PI: F García-García. 01/07/2020-30/06/2021. 11,471 €; 2) Identification of precision immunotherapy biomarkers in cancer. PI: F García-García. 15/05/2019-14/11/2019. 19,000 €; 3) FISABIO-IMATORAX. Analysis of chest radiographic images. PI: F García-García. 01/11/2022-31/12/2022. 16,335 €

#### **C.5. Scientific coordination of a singular infrastructure**

From February 2018, Francisco García is the scientific coordinator of research activity for an unique facility such as the computational infrastructure of the Príncipe Felipe Research Centre, co-financed by Conselleria de Sanidad Universal y Salud Pública, whose total cost was 900,000 euros. Functionally this infrastructure is a reference because it has been configured as a shared resource for all the units and research centres working in Personalized Medicine in the Valencian Community.

#### **C.6. Scientific dissemination**

Continued participation in numerous talks and scientific dissemination activities in various forums aimed at the general public and specialised groups as well. Selected dissemination activities: **1)** “Descubre Programme” 2015-2018: “Science for teenagers”; **2)** Pint of Science 2019, Databeers 2018: “Sex differences in health and big data”; **3)** Jornadas de Bioderecho 2019: “Big Data, Artificial Intelligence and Health”; **4)** Quart de Poblet Science Week 2018-2019: Big Data and Biomedicine; **5)** Guided tours at CIPF 2018-2021: “How to advance cancer research from Bioinformatics and Genomics”; **6)** “Genes, Big Data and Health”, Museo de las Ciencias, Valencia, 2022; **7)** Videos: Computational platform in biomedical research: <https://youtu.be/aGuTqz64gdo>; Metafun Data Science and Gender: <https://youtu.be/xOkt6sAeNTk>.

#### **C.7. Development of open-source software**

**1) Cancer tools:** [MetaFun-BC](#), [MetaFun-PDAC](#), [MetaFun-NSCLC](#), web resources for meta-analysis of DNA Methylation and RNA studies in Breast Cancer, Pancreatic Ductal Adenocarcinoma, and Non Small Cell Lung Cancer; **2) Neuroscience resources:** [MetaFun-PD](#) and [Metafun-MS](#), web-tools to identify transcriptomics signatures in Parkinson Disease and Multiple Sclerosis studies; **3) Gender tools:** [MetaFun-SCZ](#), [MetaFun-NAFLD](#), [MetaFun-AUD](#), software to evaluate sex differences in transcriptomics studies for human diseases; **4) Other biomedical software:** [MetaFun-SCI](#) (Spinal Cord Injury); [MetaFun-HKG](#) (HouseKeeping Genes selection); MetaFun (Functional Profiling).

#### **C.8. International research stays**

**1)** Pathology Department, New York University, United States. 01/09/2022-01/11/2022; **2)** National Institute of Genomic Medicine (INMEGEN), Computational Genomics Department, México. 22/07/2015- 09/09/2015; **3)** Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET, Argentina). Instituto de Agrobiotecnología y Biología Molecular (IABiMo). June 2013; **4)** Technical University of Ostrava (Czech Republic); IT4Innovations National Supercomputing Center. July 2012.

#### **C.9. Publications under review (\*corresponding author)**

**1)** *The role of microRNAs to understand sex-based differences in Alzheimer's disease.* J Llera-Oyola, H Carceller, Z Andreu, MR Hidalgo, I Soler-Sáez, F Gordillo, A Mikozi, FR Guerini M de la Iglesia-Vayá, F García-García\*; **2)** *An integrated approach to identify sex-specific genes, transcription factors and pathways in Alzheimer's disease.* A López-Cerdán, Z Andreu, A Mikozi, FR Guerini M de la Iglesia-Vayá, F García-García\*; **3)** *Drug repositioning in Alzheimer's Disease: an in silico transcriptome-based approach with sex perspective.* C Galiana-Roselló, R Grillo-Risco, I del Pino\*, F García-García\*.