MINISTERIO DE CIENCIA E INNOVACIÓN

Cofinanciado por la Unión Europea

AGENCIA ESTATAL DE INVESTIGACIÓN

CURRICULUM VITAE ABREVIADO (CVA)

***IMPORTANT** – The Curriculum Vitae cannot exceed 4 pages. Instructions to fill this document are available in the website.*

Part A. PERSONAL INFORMATION **Date CVA:** 01/09/2025

First name	JUAN ALBERTO		
Family name	MARCHAL ORTEGA		
Gender (*)		Birth date (dd/mm/yyyy)	
Passport, ID number			
e-mail		URL Web	
Open Researcher and Contributor ID (ORCID) (*)		0000-0002-2008-610X	

(*) Mandatory

A.1. Current position

Position	Senior Lecturer		
Initial date	2012		
Institution	Universidad de Jaén		
Department/Center	Departamento Biología Experimental / Facultad de Ciencias Experimentales		
Country	Spain	Teleph. number	
Key words	MCPH1, chromosome condensation, cell cycle, TOP2A checkpoints, heterochromatin, primary microcephaly, mitosis		

A.2. Previous positions (research activity interuptions, indicate total months)

Period	Position/Institution/Country/Interruption cause
2012-2012	Lecturer / Universidad de Jaén
2008-2012	Assistant Lecturer / Universidad de Jaén
2005- 2008	Postdoctoral Researcher, Institute of Human Genetics, Charite Hospital, Berlin (Germany)
2001-2005	PhD student FPU fellow of Ministry of Education and Science / Universidad de Jaén

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
PhD in Biology	Universidad de Jaén / Spain	2005
Licensed in Biology	Universidad de Jaén / Spain	2000

(Include all the necessary rows)

Part B. CV SUMMARY *(max. 5000 characters, including spaces)*

My scientific career started with a PhD thesis (2001-2005, Universidad de Jaén, Spain) focused on cytogenetic and molecular studies on the organization and evolution of the genome of wild rodent species. In this discipline, renewed by the irruption of genomics, I have maintained an active collaboration with other UJA researchers. During my postdoctoral period (Institute of Human Genetics, Charite Hospital, Berlin; PIs Profs. K. Sperling and H. Neitzel) I started my investigations in the molecular and cellular basis of a rare disease called primary microcephaly (MCPH). In addition to advancing in the identification of new loci involved in this disease, my research contributed to reveal certain aspects of mitotic division in the control of human neurogenesis. Thus, the control of the chromosomal alignment process exerted by some MCPH genes is essential for correct mitotic timing, a key determinant for neuronal production.

Upon consecution of a permanent position in UJA as assistant researcher I continued to work on this research line. Our work has provided new data on the contribution of the MCPH1 gene in the TOP2A-related decatenation mechanism that responds to chromatin entanglements in human cells. Our most recent investigations have helped us to understand the biological meaning of this control system of cell division. The induced checkpoint regulates G2 progression and mitotic entrance but does not respond to the occurrence of DNA breaks in the DNA molecule. Our work has shown that transient activation of this cell response is controlled by MCPH1 function in coordination with CHK1 and PLK1 proteins. These results are of potential interest in a tumor context, since this signaling pathway is deficient in numerous types of cancer cells.
My research activity is reflected in the participation in various regional and national research grants (11 in total); the last of them as PI and based on the scientific results mentioned above. I have also supervised 2 PhD doctoral thesis (2018, 2023, Cum Laude evaluation), one PhD in progress, and 14 experimental Master thesis in the framework of UJA Master's Degree in Biotechnology and Biomedicine. Part of these students have continued a scientific career, both in academy and private sectors. In parallel, I have established international collaborations with groups of recognized prestige that study the molecular bases of mitotic division, cell cycle control and associated pathologies: D.J. Clarke, R. Kuriyama (University of Minnesota, USA), T. Hirano (Riken Institute, Japan), M.C. Cardoso (University of Darmstad, Germany), Y. Azuma (University of Kansas), among others. This internationalization has led to research stays and relevant joint scientific publications as senior corresponding author. I have also been participating, preferably through oral communications, in specialized national and international congresses and seminars. As a complete summary of my scientific career: 56 articles collected in JCR journals, 75 communications to congresses, 3 recognized six-year ANECA research terms (“sexenios”, last one in 2020).

Other merits of interest: Director of the UJA Master's Degree in Biotechnology and Biomedicine (since 2020), Head of the Department of Experimental Biology of UJA (since 2024), reviewer of various scientific journals (FASEB Journal, EJHG, EJMG, Cells, Oncotarget), diverse science outreach activities (European Night of researchers, teaching innovation and outreach projects in primary, secondary schools, general public), FPU pre-doc scholarship (2000), post-doc fellow from the Ramón Areces Foundation (XVII Biomedicine call, 2005).

Part C. RELEVANT MERITS *(sorted by typology)*

C.1. Publications *(see instructions)*

1) Arroyo M, Fernández-Mimbrera MA, Gollini E, Esteve-Codina A, Sánchez A, Marchal JA (AC). (6/6) 2025. TOP2A inhibition and its cellular effects related to cell cycle checkpoint adaptation pathway. Scientific Reports, accepted (in press).

2) Fernández-Mimbrera MA, Salido S, Marchal JA, Alejo-Armijo A. (3/4). 2024. Tracking Selective Internalization and Intracellular Dynamics of Modified Chitosan Polymeric Micelles of Interest in Primary Hyperoxaluria Diseases. ACS Omega 9(38): 39503-39512. 10.1021/acsomega.4c03415

3) Arroyo M; Sánchez A; Cañuelo A; Heredia-Molina RF; Martínez-Molina E; Clarke DJ; Marchal JA (AC). (7/7). 2020. MCPH1 Lack of Function Enhances Mitotic Cell Sensitivity Caused by Catalytic Inhibitors of Topo II GENES. MDPI. 11-4, pp.doi:10.3390/genes11040406. ISSN 2073-4425.

4) Arroyo M; Cañuelo A; Calahorra J; Hastert FD; Sánchez A; Clarke DJ; Marchal JA (AC). (7/7). 2020. Mitotic entry upon Topo II catalytic inhibition is controlled by Chk1 and Plk1. FEBS Journal. Willey. 287-22, pp.10.1111/febs.15280. ISSN 1742-464X. Q1

5) Heinz KS; Rapp A; Casas-Delucchi CS; et al; Marchal JA; Cardoso MC. (8/9). 2019. DNA replication dynamics of vole genome and its epigenetic regulation Epigenetics and Chromatin. BMC. 12-1, pp.doi: 10.1186/s13072-019-0262-0. ISSN1756-8935. Q1

6) Arroyo M; Kuriyama R; Guerrero I; et al; Marchal JA (AC). (10/10). 2019. MCPH1 is essential for cellular adaptation to the G2-phase decatenation checkpoint. FASEB Journal. FASEB. 33-7, pp.8363-8374. ISSN 1530-6860. Q1

7) Arroyo M; Kuriyama R; Trimborn M; Keifenheim D; Cañuelo A; Sanchez A; Clarke DJ (AC); Marchal JA. (7/7). 2017. MCPH1, mutated in primary microcephaly, is required for efficient chromosome alignment during mitosis. Scientific Reports. Springer Nature. 7-13019. ISSN 2045-2322. Q1

8) Arroyo M; Trimborn M; Sanchez A; Hirano T; Neitzel H; Marchal JA (AC). (6/6). 2015. Chromosome structure deficiencies in MCPH1 syndrome. CHROMOSOMA. Springer. 124-4, pp.491-501. ISSN 0009-5915. Q1

9) Romero-Fernández I; Casas-Deluchi CS; Cano-Linares M; Arroyo M; Sanchez A; Cardoso MC; Marchal JA (AC). (7/7). 2015. Epigenetic modifications in sex heterochromatin of vole rodents CHROMOSOMA. Springer. 124-3, pp.341-351. ISSN 0009-5915. Q1

10) Marchal, JA (AC); Ghani, Mahdi; Schindler, Detlev; et al; Neitzel, Heidemarie. (1/16). 2011. Misregulation of mitotic chromosome segregation in a new type of autosomal recessive primary microcephaly. Cell Cycle. 10-17, pp.2967-2977. ISSN 1538-4101. Q1

11) Gavvovidis, Ioannis; Poehlmann, Charlotte; Marchal, JA; et al; Trimborn, Marc. (3/9). 2010. MCPH1 patient cells exhibit delayed release from DNA damage-induced G2/M checkpoint arrest. Cell Cycle. 9-24, pp.4893-4899. ISSN1538-4101. Q1

C.2. Congress, indicating the modality of their participation (invited conference, oral presentation, poster)

1) Fernández-Mimbrera MA, Arroyo M, Sánchez A, Azuma Y, Clarke DJ, Marchal JA. Analyses of epigenetic signalling upon G2 decatenation checkpoint response in human cells. *XLIII Congreso Sociedad Española de Genética*. 2023, Valencia, Spain. Oral Presentation.

2) Gollini E; Fernández-Mimbrera MA; Sánchez A; Azuma Y; Clarke DJ; Marchal JA. Investigando las bases del alineamiento cromosómico retrasado en el síndrome de microcefalia primaria MCPH1. *XI Seminario Citogenética. Sociedad Española de Genética. Jaén 2022*. Spain. Oral presentation.

3) Arroyo M, Cañuelo AR, Heredia-Molina RF, Martinez-Molina E, Clarke DJ, Sanchez A, Marchal JA. Increased mitotic cell death in MCPH1 depleted cells upon catalytic inhibition of TOPO II. *XLII Congreso Sociedad Española de Genética. 2021 (online meeting)*. Spain. Oral presentation

4) Arroyo M; Cañuelo A; Calahorra J; Hastert F; Sánchez A; Clarke DJ; Marchal JA. Cellular Adaptation To G2-phase Decatenation Checkpoint Is Controlled By MCPH1-CHK1-PLK1 Axis. *Meeting of the American Society for Cell Biology (ASCB) and the European Molecular Biology Organization (EMBO) online International Meeting*. American Society of Cell Biology and EMBO. 2020. Poster

5) Arroyo M; Cañuelo A; Sanchez A; Kuriyama R; Clarke DJ; Marchal JA. MCPH1, mutated in primary microcephaly, contributes to G2-phase decatenation checkpoint in human cells by modulating CHK1 and PLK1 activity. *Current Trends in Biomedicine Workshop: Molecular causes of primary microcephaly and related diseases*. Universidad Internacional de Andalucía. 2019. Spain. Oral presentation

6) Arroyo M; Cañuelo A; Calahorra J; Sanchez A; Kuriyama R; Clarke DJ; Marchal JA. MCPH1 modulates the G2-phase decatenation checkpoint in human cells. *Current Trends in Biomedicine Workshop: Chromosome Architecture and Topological Stress*. Universidad Internacional de Andalucía. 2018. Spain. Poster

7) Arroyo M; Sanchez A; Kuriyama R; Clarke DJ; Marchal JA. Chromosome topology and mitosis control in human cells: role of MCPH1. *EMBO/EMBL Symposium: Principles of Chromosome Structure and Function. European Molecular Biology Laboratory*. Heidelberg, 2018. Germany. Poster

8) Arroyo M, Guerrero I, Kuriyama R, Sánchez A, Clarke DJ, Marchal JA. MCPH1 is required for timed chromosome alignment during metaphase. *EMBO Workshop on "Cell division: molecular machineries and cancer targeted therapies. EMBO. 2015*. Baeza, Spain. Oral presentation.

9) Arroyo M, Cañuelo AR, Guerrero I, Kuriyama R, Clarke DJ, Sanchez A, Marchal JA. MCPH1 is required for timed progression of chromosome condensation and mitosis pathways. *XL Congreso Sociedad Española de Genética. 2015, Córdoba, Spain. Poster*

10) Juan Alberto Marchal Ortega; Cristina Cardoso; Antonio Sánchez Baca; Maria Arroyo Lopez; Corella Casas-Delucchi; Ismael Romero Fernández. Chromatin modifications and replication dynamics of heterochromatin from vole rodents. *19th Chromosome Conference. 2013*. Bologna, Italy. Oral presentation

11) Heidemarie Netizel; Marc Trimborn; Antonio Sánchez Baca; Ismael Romero Fernández; María Arroyo Lopez; Juan Alberto Marchal Ortega. Mitotic and chromosomal deficiencies in Primary Microcephaly syndrome (MCPH). *19th Chromosome Conference. 2013*. Bologna, Italy. Oral presentation

C.3. Research projects, indicating your personal contribution. In the case of young researchers, indicate lines of research for which they have been responsible.

1) Project. Topología cromosómica como nuevo mecanismo regulador de la salida del ciclo celular. Proyectos I+D+i en el Marco del Programa Operativo FEDER Andalucía 2014-2020_convocatoria 2020 (Consejería de Innovación, Ciencia y Empresa, Consejería de Innovación, Ciencia y Empresa, Junta de Andalucía). IP: Juan Alberto Marchal Ortega. (Universidad de Jaén). 01/01/2021-30/06/2023. 84.379,71 €.

2) Project. Contribución de la prefoldina-like URI/Bud27 a la expresión y a los niveles intracelulares de tRNA y su correlación con el cáncer. Influencia del remodelador de cromatina RSC y de la vía de señalización TOR.. IP: Francisco Nicolás Navarro Gómez. (Universidad de Jaén). 01/01/2020-31/12/2021. Contribución: miembro de equipo.

3) Project. Potencial de Mcph1 Como Factor Genético Implicado en Cáncer de Pulmón No Microcítico (Adenocarcinoma y Epidermoide). Consejería de Salud de la Junta de Andalucía. IP: Juan Alberto Marchal Ortega. (Universidad de Jaén). 01/01/2018-31/12/2020. 47.638,31 €.

4) Project. Arqueogenética, herramientas desde la Bioarqueología para la investigación de las relaciones de género en la Prehistoria y la Protohistoria. Referencia HAR2016-80020-P. Maria Isabel Torres Lopex. (Universidad de Jaén). 31/12/2016- 31/12/2020. 59.290 €. Contribución: miembro de equipo.

5) Project. Análisis molecular y estructural de los defectos en la condensación cromosómica y segregación cromosómica en el síndrome de microcefalia primaria autosómica recesiva. Universidad de Jaén. IP: Juan Alberto Marchal Ortega. (Universidad de Jaén). 19/03/2012-18/03/2014. 8.376 €.