



CURRICULUM VITAE (CVA)

CV date

06/04/2026

Part A. PERSONAL INFORMATION

First name	Mónica		
Family name	Bullejos Martín		
Gender (*)	Female		
Social Security, Passport, ID number			
e-mail		URL Web	
Open Researcher and Contributor ID (ORCID) (*)		0000-0003-3256-8840	

(*) Mandatory

A.1. Current position

Position	Catedrática de Universidad		
Initial date	23/02/2026		
Institution	Universidad de Jaén		
Department/Center	Biología Experimental	Facultad de Ciencias experimentales	
Country	Spain	Teleph. number	953212770
Key words	Sex determination, sex chromosomes, gonadal development, sex reversal, amphibian, <i>Xenopus</i>		

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

Period	Position/Institution/Country/Interruption cause
1989-1992	Alumna Interna/Universidad de Granada/Spain
1990-1992	Becaria de Colaboración/Universidad de Granada/Spain
1993	Becaria de apoyo administrativo a la investigación/Universidad de Granada/Spain
1994-1997	Becaria FPU/Universidad de Granada/Spain
1997-1998	Profesor Asociado Tipo 1/Universidad de Jaén/Spain
1998-2000	Ayudante Facultad/Universidad de Jaén/Spain
1999-2001	Becaria posdoctoral/University of Queensland/Australia
2000-2003	Profesor Asociado Tipo 3/Universidad de Jaén/Spain
2003-2026	Profesora Titular de Universidad/Universidad de Jaén/Spain
2026-present	Catedrática de Universidad/Universidad de Jaén/Spain
2007 (3 months)	Research stay at MRC (London, UK)
2010 (1 month)	Research stay at MRC (London, UK)
2025 (3 month)	Research stay at NXR, Marine Biological Laboratory (Massachusetts, EE.UU.)

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Doctorado en Ciencias Biológicas (Genética)	Universidad de Granada	23/09/1998
Licenciada de Grado (Tesina)	Universidad de Granada	16/07/1993
Licenciada en Ciencias Biológicas	Universidad de Granada	20/07/1992

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

SCIENTIFIC CONTRIBUTIONS

My research activity focuses on the study of sex chromosome evolution, sex determination and gonadal differentiation in various vertebrate models. I use classical genetic, cytogenetic, molecular, histological, genomic and developmental approaches to find out how sex determining genes and sex

chromosomes evolve in different vertebrate groups, and how the genes involved in gonadal differentiation pathway change in different taxonomic groups. In the last years I have worked to optimize the use of the species *Xenopus tropicalis* as animal model to study sex determination and gonadal differentiation in amphibians. The main contributions to the field are:

- Identification of the dominance relationships between two sex-determining genes using *Xenopus* hybrids.
- Identification of the sex chromosome system of *X. tropicalis*, with three types of males (YZ, YW and ZZ) and two types of females (ZW and WW).
- Evolution of sex chromosomes in vertebrates, especially in rodents and amphibians.
- Discovery of species with the *Sry* gene localized on the X chromosome.
- Discovery of ovotestes in all the females of species belonging to genus *Talpa*.
- First visualization of the spatial-temporal expression pattern of the *Sry* gene in mouse. These results allowed us explain the origin of Y^{DOM} sex reversal: a delay in the expression of the *domesticus* alleles of the *Sry* gene.
- Identification of genes with differential expression in developing gonads and characterization of new genes involved in gonadal differentiation.
- Meiosis entry in female germ cells is not cell-autonomous, as previously proposed, but depends on external signals from the mesonephros. This allowed the identification of the role of retinoic acid in meiosis entry.

In 2009 a new animal facility was built and I was banned to perform crosses with wild mice. This forced me to move into amphibians. This caused a stop in my scientific production, since I had to establish a pathogen free colony from a limited number of animals (low survival rates due to sterilization of eggs, about 1 year for sexual maturity, 2-month rests between crosses). The colony I manage now has about 500 pathogen-free animals, characterized in terms of sex chromosomes.

I have tried to published my research in journals with the highest possible impact index in the field, but should be noted that cytogenetics journals have low impact factors in their field. In terms of funding, since I finished my postdoc I have been seeking funding for my research lines. In this regard, I have been principal investigator of 3 national, 1 regional and 1 local project. I routinely collaborate with several groups with similar research interests. However, the reduced critical mass at the University of Jaén and the impossibility of stabilizing staff to allow the growth of my group are two limiting factors to obtain research funding.

SOCIAL CONTRIBUTIONS

My scientific career has been focused in basic research. However, I have tried to apply our results to contamination (e.g. testing of putative endocrine disrupting compounds) and conservation problems. In this sense, we analysed the window of susceptibility of *X. tropicalis* to the exposure of masculinizing and feminizing compounds. These results are the base for future toxicological assays. Regarding amphibian conservation, we are currently collaborating with the “Centro de Rescate de Anfibios y Reptiles” de Alcalá la Real, to apply our protocols to the biobanking of wild samples and to the recovery of threatened species.

Concerning outreach actions, I participate in science informative activities for pre-university students. Within the framework of plan for the dissemination of science and innovation of the UJA, I have developed research projects to expose the students to amphibian models, their reproduction, development, and the population decline this vertebrate group is suffering.

CONTRIBUTIONS TO RESEARCH TRAINING AND EVALUATION

I have participated in the training of young researchers at all levels. I tutored 1 student with a collaboration grant (MEC), 11 TFG, 13 TFM and 3 DEA. From these, 6 students decided to continue their scientific career in our group (3 with FPU grants and 1 with FPI). I have supervised 6 doctoral theses (3 of them co-directed). All of them are international doctorates (or equivalent). I also participate in external internships (tutored 3 foreign and 3 national students), and I am involved in the training of researchers to work with experimental animals (I have tutored 4 TBS for the training of personnel in the care and handling of experimental animals at the CPEA of the UJA).

Part C. RELEVANT MERITS (sorted by typology)

C.1. Publications (see instructions)

1. K. Guzmán-Markevich; Á. S. Roco; A. Ruiz-García; **M. Bullejos** (2022). Cytogenetic Analysis in the Toad Species *Bufo spinosus*; *Bufo viridis* and *Epidalea calamita* (Anura; Bufonidae) from the Mediterranean Area. *Genes*, 13(8): 1475- 1475.
2. K. Guzmán; Á. S. Roco; M. Stöck; A. Ruiz-García; E. García-Muñoz; **M. Bullejos** (2022). Identification and characterization of a new family of long satellite DNA; specific of true toads (Anura; Amphibia; Bufonidae). *Scientific Reports*, 12(1): 13960- 13960.
3. Guzmán, K., Roco, Á.S., Martínez-Padilla, A., **Bullejos, M.** (2021). Comparative cytogenetic analysis in the toad species *Bufo bufo*, *Epidalea calamita* and *Bufo viridis* (Anura, Bufonidae) from the Mediterranean area. *Genes* (Submitted).
4. Kratochvíl, L.; Stöck, M.; Rovatsos, M.; **Bullejos, M.**; Herpin, A.; Jeffries, D.L.; Peichel, C.L.; Perrin, N.; Valenzuela, N.; Pokorná, M.J. (2021). Expanding the classical paradigm: What we have learnt from vertebrates about sex chromosome evolution. *Philos. Trans. R. Soc. B Biol. Sci.*, 376: 20200097.
5. Roco, Á.S., Ruiz-García, A., **Bullejos, M.** (2021). Testis Development and Differentiation in Amphibians. *Genes*, 12: 578.
6. Roco Á.S., Liehr T, Ruiz-García A., Guzmán K., **Bullejos M.** (2021). Comparative distribution of repetitive sequences in the karyotypes of *Xenopus tropicalis* and *Xenopus laevis* (Anura, Pipidae). *Genes*, 12: 617.
7. Ruiz-García A., Roco Á.S., **Bullejos M.** (2021). Sex-differentiation in amphibians: effect of temperature and its influence on sex reversal. *Sexual Development.*, 15: 157-167.
8. Roco Á.S., Ruiz-García A., **Bullejos M.** (2021). Interaction between sex-determining genes from two species: clues from *Xenopus* hybrids. *Philos. Trans. R. Soc. B Biol. Sci.*, 376: 20200104.
9. Roco, Á.S., Olmstead, A.W., Degitz, S., Amano, T., Zimmerman, L.B., **M. Bullejos.** (2015). Coexistence of Y, W and Z sex chromosomes in *Xenopus tropicalis*. *Proceedings of the National Academy of Sciences USA*. 112(34): E4752-4761.
10. Acosta, M.J., Marchal, J.A., Fernández-Espartero, C.H., **Bullejos, M.**, Sánchez, A. (2008). Retroelements (LINEs and SINEs) in vole genomes: Differential distribution in the constitutive heterochromatin. *Chromosome Research* 16(7): 949-959.
11. Roco, Á.S., Díaz de la Guardia Quiles, R., Falconi, R., Zaccanti, F., Durussel, J.D., Marchal, J.A., Sánchez, A., **Bullejos, M.** (2008). Sex Determination and Gonadal Development in the Common Toad (*Bufo bufo*). *Sexual Development* 2(6): 286-287.
12. **Bullejos, M.**, Koopman, P. (2005). Delayed Sry and Sox9 expression in developing mouse gonads underlies B6-YDOM sex reversal. *Developmental Biology* 278: 473-481.

C.2. Congress

1. **Meeting:** 1st European Symposium on Sex Determination in Vertebrates. **Type of contribution:** Oral communication. **Title:** Sex chromosomes and sex determining system in *Xenopus tropicalis*. **Authors:** Á.S. Roco, A. Castillo, L. Zimmerman, T. Amano, A. Olmstead and M. Bullejos. **Date and place:** Dinard, 2017.
2. **Meeting:** European Amphibian Club. **Contribution:** Invited communication (oral). **Title:** Genetic basis of sex determination in *Xenopus tropicalis*. **Authors:** Á.S. Roco, A. Castillo, L. Zimmerman, T. Amano, A. Olmstead and M. Bullejos. **Date and place:** Rennes, 2017.
3. **Meeting:** ESEB Special Topic Networks. Workshop “Connecting population genetics and developmental biology to elucidate vertebrate sex evolution”. **Contribution:** Invited communication (oral). **Title:** An animal model with three sex chromosomes: The *Xenopus tropicalis* paradigm. **Authors:** Á.S. Roco, A. Ruiz-García, D. Puerta-Martos and M. Bullejos. **Date and place:** Praga, 2018.
4. **Meeting:** ESEB Special Topic Networks. Workshop “Paradigm shift in sex chromosome evolution”. **Contribution:** Invited communication (oral). **Title:** Sex chromosomes and sex determining system in *Xenopus tropicalis*: a meiotic mess. **Authors:** Á.S. Roco, A. Ruiz-García and M. Bullejos. **Date and place:** Berlín, 2019.
5. **Meeting:** EMBL Symposium: The Molecular Basis and Evolution of Sexual Dimorphism. **Contribution:** Oral communication. **Title:** Interaction between sex-determining genes in hybrids.

Lessons from *Xenopus*. **Authors:** Á.S. Roco, A. Ruiz-García and M. Bullejos. **Date and place:** Online, 2020.

C.3. Research projects

1. **Reference:** PID2021-125593NB-I00; **Título:** Análisis evolutivo, genómico y funcional del determinismo del sexo y la diferenciación gonadal en anfibios (género *Xenopus*); **Funding Entity:** Ministerio de Ciencia e Innovación; **IP:** Mónica Bullejos (UJAEN). **Duration:** 01/09/2022 - 31/08/2026. **Funding:** 272.250,00 €. **Participation type:** PI. **Research team:** 5.
2. **Reference:** TED2021-131133B-I00; **Título:** Estrategias de conservación en anfibios: análisis de factores exógenos capaces de inducir reversión sexual y clonación mediante transferencia de núcleos; **Funding Entity:** Ministerio de Ciencia e Innovación; **IP:** Mónica Bullejos (UJAEN). **Duration:** 01/12/2022 - 30/09/2025. **Funding:** 155.250,00 €. **Participation type:** PI. **Research team:** 5.
3. **Referencia:** BFU2016-78001-P; **Título:** Cromosomas sexuales y diferenciación gonadal en *Xenopus tropicalis*, modelo anfibio con cromosomas sexuales Y, W y Z. **Funding Entity:** MEyC. **IP:** Mónica Bullejos (UJAEN). **Duration:** 30/12/2016 - 29/12/2019. **Funding:** 145.200,00 €. **Participation type:** PI. **Research team:** 1.
4. **Referencia:** CGL2009-08894; **Título:** Análisis del determinismo del sexo y la diferenciación gonadal en anfibios. **Funding Entity:** MCI. **IP:** Mónica Bullejos (UJAEN). **Duration:** 01/01/2010 - 31/12/2013. **Funding:** 90.750 €. **Participation type:** PI. **Research team:** 2 nationals and 3 internationals.