

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

First name	Carmen Belén		
Family name	Martínez Madrid		
Gender (*)	Female	Birth date (25/12/1973)	
Social Security, Passport, ID number	73387575A		
e-mail	belmart@ucm.es	URL Web	
Open Researcher and Contributor ID (ORCID) (*)		0000-0001-6852-4597	

(*) Mandatory

A.1. Current position

Position	Associate Professor (Profesora Titular)		
Initial date	May 2018		
Institution	Universidad Complutense de Madrid		
Department/Center	Department of Animal Medicine and Surgery	<u>Faculty of Veterinary</u>	
Country	Spain	Teleph. number	+34- 609962268
Key words			

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

Period	Position/Institution/Country/Interruption cause
2019-2020	4 months of maternity leave
2014-2018	Profesora Contratado Doctor (UCM)
2006-2014	Ayudante y Profesora Ayudante (UCM)
2006-2014	Ayudante y Profesora Ayudante (UCM)
2006-2014	Ayudante y Profesora Ayudante (UCM)
2002-2006	Postdoctoral fellow (Catholic University of Lovain, UCL)
1998-2002	Predocctoral fellow (INIA)
1997-1998	Predocctoral fellow (CBMSO-CSIC-UAM)

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Veterinary (Licensed)	Universidad Complutense de Madrid	1996
Veterinary (PhD)	Universidad Complutense de Madrid	2002

(Include all the necessary rows)

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

After graduating in Veterinary Medicine from the Complutense University of Madrid (UCM) in July 1996, I began my RESEARCH ACTIVITY in February 1997, as a fellow at the CBMSO of the CSIC-UAM, within the project "Optimization of the ultra-rapid cryopreservation methodology for the creation of a mouse embryo bank", under the direction of Dr. Nieto (16 months). In 1998 I did a 3-month stay at the Laboratoire de Génétique des Mammifères, Institut Pasteur (Paris) in "Semen cryopreservation, in vitro fertilization (IVF) and DNA microinjection in mice", under the direction of Dr. Guénet. In September 1998 I obtained a 4-



year INIA predoctoral Research Training scholarship. During this period, I worked in the Department of Animal Reproduction of the INIA on two research and development projects, under the direction of Dr. Sánchez, my DOCTORAL THESIS titled "Study of in vitro fertilization in pigs. Reduction of polyspermy and optimization of in vitro embryo production", receiving Outstanding Cum laude in December 2002. My POSTDOCTORATE, of 4 years, took place at the Département de Gynécologie, Faculté de Médecine, Université Catholique de Louvain (UCL), in Brussels, where I obtained an FSR (Fonds Spécial de Recherche) award from the UCL Research Council and a UCL Postdoctoral Fellowship. I participated in 9 research projects with Professor Donnez and 2 with Professor Marbaix, which gave rise to extensive scientific production. In 2004, I completed a 1-month training stay at the Laboratory of Human Stem Cells, Department of Clinical Sciences, Karolinska University Hospital, Karolinska Institutet (Stockholm) on "Derivation, culture and characterization of embryonic stem cell lines", under the direction of Professor Hovatta. Since October 2006 I have been part of the TEACHING AND RESEARCH STAFF (PDI) of the Department of Animal Medicine and Surgery of the Faculty of Veterinary Medicine of the UCM. Initially, I joined two UCM Research Groups, participating in projects directed by Rosana Picazo González. In 2008, I carried out a 3.5-month research stay, within the UCM Professor program abroad, at the Department of Reproductive Sciences, Center of Species Survival, Smithsonian National Zoological Park, Smithsonian Institution (Washington DC, USA), on "Cryopreservation of gonadal tissue in exotic and endangered species (wild felines and canids)", under the direction of Dr. Wildt. Since 2018, and as a Full Professor UCM, I joined the Group of Physiology and Biotechnology of Reproduction in Small Ruminants of the Department of Animal Reproduction of the INIA, headed by Julián Santiago Moreno, first within the project AGL2017-85753-R "Variations in the effectiveness of cryopreservation of spermatozoa of small ruminants as a response to seasonal changes in thyroid hormones and the expression of aquaporins", and followed by the project PID2020-113288RB-I00 "Mechanisms of sperm cryo-resistance and new sperm and testicular tissue cryopreservation procedures in domestic and wild ruminants (CRYORUMIN)". Within the aforementioned project, AGL2017-85753-R, I have carried out two short research stays, one in 2019 at the Department of Clinical and Experimental Medicine (IKE) /Faculty of Medicine and Health Science, Linköping Universitet, Sweden (5 days) within the ERASMUS+ Programme. Teaching Mobility Programme, and another in September 2020 (1 month) on the Pathology Platform of the Murcian Institute of Biosanitary Research.

Part C. RELEVANT MERITS (sorted by typology)

C.1. Publications (see instructions)

Martínez-Madrid B, Martínez-Cáceres C, Pequeño B, Castaño C, Toledano-Díaz A, Bóveda P, Prieto P, Alvarez-Rodríguez M, Rodríguez-Martínez H, Santiago-Moreno J. 2023. Immunolocalisation of aquaporins 3, 7, 9 and 10 in the epididymis of three wild ruminant species (Iberian ibex, mouflon and chamois) and sperm cryoresistance. *Reprod Fertil Dev.* 35(16):708-721.

Santiago-Moreno J, Toledano-Díaz A, Castaño C, Velázquez R, Bóveda P, O'Brien E, Peris-Frau P, Pequeño B, Martínez-Madrid B, Esteso MC. 2023. Review: Sperm cryopreservation in wild small ruminants: morphometric, endocrine and molecular basis of cryoresistance. *Animal.* 17 Suppl 1:100741.

Pequeño B, Castaño C, Alvarez-Rodríguez M, Bóveda P, Millán de la Blanca MG, Toledano-Díaz A, Galarza DA, Rodríguez-Martínez H, Martínez-Madrid B, Santiago-Moreno J. 2023.



Variation of existence and location of aquaporin 3 in relation to cryoresistance of ram spermatozoa. *Front Vet Sci.* 10:1167832.

Pequeño B, Martínez-Madrid B, Castaño C, Toledano-Díaz A, Bóveda P, Esteso MC, Gómez-Guillamón F, Prieto P, Marcos-Beltrán JL, Alvarez-Rodríguez M, Rodríguez-Martínez H, Santiago-Moreno J. 2023. Location of aquaporins 3, 7 and 10 in frozen-thawed ejaculated and cauda epididymal spermatozoa from the Iberian ibex, mouflon, and chamois. *Theriogenology Wild* 2:100025

Peris-Frau P, Benito-Blanco J, Martínez-Nevaldo E, Toledano-Díaz A, Castaño C, Velázquez R, Pequeño B, Martínez-Madrid B, Esteso MC, Santiago-Moreno J. 2023 DNA integrity and viability of testicular cells from diverse wild species after slow freezing or vitrification. *Front Vet Sci.* 9:1114695.

O'Brien E, Malo C, Castaño C, García-Casado P, Toledano-Díaz A, Martínez-Madrid B, Rodríguez-Martínez H, Álvarez-Rodríguez M, Santiago-Moreno J. 2022. Sperm freezability is neither associated with the expression of aquaporin 3 nor sperm head dimensions in dromedary camel (*Camelus dromedarius*). *Theriogenology* 189:230-236.

Santiago-Moreno J, Pequeño B, Martínez-Madrid B, Castaño C, Bóveda P, Velázquez R, Toledano-Díaz A, Álvarez-Rodríguez M, Rodríguez-Martínez H. 2022. Expression of Aquaglyceroporins in Spermatozoa from Wild Ruminants Is Influenced by Photoperiod and Thyroxine Concentrations. *Int J Mol Sci.* 23(6):2903.

Belén Martínez-Madrid, Cristina Castaño, Luis Pablo Ureña, Elena Flix, Rosario Velázquez, Antonio López-Sebastián, Rodolfo Ungerfeld, Francisco A. Arrebola, Julián Santiago-Moreno. 2021. Seasonal changes in testosterone and thyroxine concentrations in Mediterranean rams and bucks and their relationship with sperm cryoresistance, *Livestock Science* 249:104513.

Santos RR, Amorim C, Cecconi S, Fassbender M, Imhof M, Lornage J, Paris M, Schoenfeldt V, Martínez-Madrid B. 2010. Cryopreservation of ovarian tissue: an emerging technology for female germline preservation of endangered species and breeds. *Animal Reproduction Science*, 122(3-4): 151-163.

Donnez J, Dolmans MM, Demylle D, Jadoul P, Pirard C, Squifflet J, Martínez-Madrid B, van Langendonck A. 2004. Livebirth after orthotopic transplantation of cryopreserved ovarian tissue. *Lancet* 364(9443): 1405-1410

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

(most representative invited conferences):

Martínez-Madrid B. Whole ovary and ovarian tissue cryopreservation. *Consensus Meeting: Fertility preservation Update*. International Center for Scientific debate of Biocat y Fundación Dexeus. Barcelona, España, 6-7 June 2011 (invited conference)

Martínez-Madrid B. Cryopreservation of whole ovaries. Exploratory Workshop on: Cryopreservation of ovarian tissue in cancer patients, farm animals and endangered species. European Science Foundation (ESF). Heidelberg (Germany), 15-17 May 2008. (invited conference)

Martínez-Madrid B. Methods to dissect human ovarian follicles. Workshop on Mammalian Oogenesis and Folliculogenesis. European Society of Human Reproduction and Embryology



(ESHRE). Domaine de Vaulx de Cerna, Paris (France), 31 Marzo-2 Abril 2005. (invited conference)

(most representative oral presentations and posters):

Martínez-Nevado E, Peris-Frau P, Benito-Blanco J, Toledano-Díaz A, Castaño C, Velázquez R, Pequeño B, Martínez-Madrid B, Estes MC, Santiago-Moreno J. Survival potential of testicular germ cells from diverse wild artiodactyls after slow freezing or vitrification. Zoo and Wildlife Health Conference (European Association of Zoo and Wildlife Veterinarians, EAZWV 2023). Valencia (Spain), 7-10 Jun. 2023

Pequeño B, Laborda-Gomariz JA, Bóveda P, Castaño C, Toledano-Díaz A, Martínez-Madrid B, Soler AJ, Santiago-Moreno J. Relocation of aquaporin-3 (AQP3) in ram sperm after the freeze-thawing process. 11th International Ruminant Reproduction Symposium (IRRS 2023). Galway (Ireland), 28 May-1 Jun. 2023

Martínez-Madrid B, Encinas T, Tinetti P, Jiménez JA, Gilabert RA, Picazo RA. New defined serum-free culture system for isolated sheep primordial follicles with stromal cells: morphometric, steroidogenic and molecular characterization. 28th Annual Meeting of the European Society of Human Reproduction and Embryology (ESHRE). Estambul (Turkey), 1-4 Jul. 2012. Published at: Human Reproduction 2012, 27 (Supplement 1): i254. (poster)

Comizzoli P, Martínez-Madrid CB, Pukazhenthil B, Wildt D. Vitrification of ovarian cortex from prepubertal and adult cats induces less damage to the primordial follicles than slow freezing. 42nd Annual Meeting of the Society for the Study of Reproduction (SSR), Pittsburgh, Pennsylvania (USA), 18-22 Jul. 2009. Published at: Biology of Reproduction 2009, 81: 90-91 (Nº187). (oral presentation).

Aerts J, Martínez-Madrid B, Flothmann K, De Clercq J, Bols P.). Viability of enzymatically isolated bovine primordial and primary ovarian follicles collected through the use of the biopsy pick-up technique. XXXIII Annual Conference of the International Embryo Transfer Society (IETS). Kyoto (Japan), 7-9 Jan. 2007. Published at: Reproduction, Fertility and Development 2007, 19(1): 321-322 (Nº412). (poster)

Martínez-Madrid B, Veiga-Lopez A, Van Langendonck A, Groothuis P, Camboni A, Dolmans MM, Donnez J. CAM model to study human ovarian tissue transplantation. 22th Annual Meeting of the European Society of Human Reproduction and Embryology (ESHRE). Praga (Czech Republic), 18-21 Jun. 2006. Published at: Human Reproduction 2006, 21 (Supplement 1): i107 (O-275). (oral presentation).

Martínez-Madrid B, Camboni A, Dolmans MM, Nottola S, Van Langendonck A, Donnez J. Apoptosis and ultrastructure in frozen intact human ovary. 21th Annual Meeting of the European Society of Human Reproduction and Embryology (ESHRE). Copenhagen (Denmark), 19-22 Jun. 2005. Published at: Human Reproduction 2005, 20 (Supplement 1): i37-i38 (O-103). (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.

PID2020-113288RB-100. Mechanisms of sperm cryoresistance and new procedures for



sperm and testicular tissue cryopreservation in domestic and wild ruminants. AEI. Programa Estatal I+D+I. 2021-2024 (36 months). 169.400 €. PI: Julián Santiago Moreno.

AGL2017-85753-R. Variability in the efficacy of sperm cryopreservation from small ruminants related with seasonal changes in thyroid hormones and aquaporins expression. MCINN. Programa Estatal I+D+I. 2018-2020 (36 months). 178.112 €. PI: Julián Santiago Moreno

AGL2008-03227/GAN. Co-culture of ovine primordial follicles with ovarian stromal cells: new experimental model for the study of local and endocrine regulation of ovarian preantral folliculogenesis. MCINN. Programa Estatal I+D+I. 2009-2011 (36 months). 90.750 €. PI: Rosana Picazo González.

RZ2007-00010-C02-01. Application of assisted reproductive technologies and genetic material conservation in Iberian pig females. INIA. Genetic Resources Programme. 2007-2009 (24 months). 88.107 €. PI: Antonio González de Bulnes López

FRSM 3.4537.07. Mechanisms inducing hemorrhage in the human endometrial: study on a xenograft model in immunodeficient mouse. Fonds de Recherche Scientifique Médicale (FRSM) de la Communauté Française de Belgique. 2007-2008 (24 months). 98.500 €. PI : Etienne Marbaix

FRSM 3.4636.06. Spatio-temporal control of the expression and activity of matrix metalloproteases and their tissue inhibitors in the human endometria. Fonds de Recherche Scientifique Médicale (FRSM) de la Communauté Française de Belgique. 2006-2009 (48 months). 336.500 €. PI : Etienne Marbaix

FNRS Télévie 2004. 7.4519.04. Restoration of fertility in cancer patients by cryopreservation of ovarian tissue, in vitro follicle and oocyte maturation and characterization of the implantation window. Fonds National de la Recherche Scientifique (FNRS) de Belgique. 2004-2006 (24 months). 60.000 €. PI: Jacques Donnez.

FRSM-3.4599.02. Study of “growth differentiation factor-9, kit-ligand, keratinocyte growth factor, hepatocyte growth factor”, and their receptors in the human ovary to study their effect on folliculogenesis and oocyte maturation. Fonds de Recherche Scientifique Médicale (FRSM) de la Communauté Française de Belgique. 2002-2005 (48 months). 59.494 €. PI: Jacques Donnez.

RZ00/006/C21. Characterization and cryoconservation of epididimal spermatozooids and ejaculates from iberian pigs: study of its viability through in vitro fecundation (IVF) and artificial insemination (AI). INIA. Genetic Resources Programme. 2000-2003 (36 months). 41.061 €. PI: Raúl Sánchez Sánchez.

SC98-100-C2-1. In vitro production of embryos in native bovine breeds. MAPA Agricultural and Food I+D Sector Plan. 1998-2000 (36 months). 101.492,91 €. PI: Julio de la Fuente

C.4. Contracts, technological or transfer merits, Include patents and other industrial or intellectual property activities (contracts, licenses, agreements, etc.) in which you have collaborated. Indicate: a) the order of signature of authors; b) reference; c) title; d) priority countries; e) date; f) Entity and companies that exploit the patent or similar information, if any

Incorporation of equipure in the freezing protocol of pure breed spanish horse semen. Research contract (Art. 83 LOU) between Equipos Veterinario-Biológicos S.L. and UCM. 2009-2010 (12 months). 3500 €. PI: Consuelo Serres Dalmau

EUREKA E! 3427 EUROAGRI FERT IA. Improvement of fertility in swine: control of semen quality and animal welfare in artificial insemination centres. Eureka Programme between Nutrivall SLU, Sociedade Agropecuaria de Vale Henriques SA, IRTA and INIA. 2006-2009 (36 months). 147.901 €.



SCIE2004-37. Cryopreservation of ovarian tissue removed before chemotherapy allows restoration of ovarian function after orthotopic transplantation. Research agreement between Belge Federation Against Cancer and Catholic University of Louvain (UCL). 2004-2007 (36 months). 90.000 €. PI: Jacques Donnez

Optimization of the ultra-fast cryopreservation methodology for the creation of a mouse embryo bank. Research agreement between Carbuos Metálicos SA and CSIC-UAM and INIA. 1997-1998 (16 months). 15.025 €. PI: Antonio Nieto

Patents and Trademarks:

Picazo González RA., Sánchez Maldonado B., Encinas Cerezo T., Gilabert Santos JA., Ros Rodríguez JM., Sánchez Pérez A., García Palencia P., Martínez-Madrid B., Aranda Espinosa PJ., Tinetti P Pinto. Double-inclusion method for the study of the histology and/or localisation of molecular markers in pluricellular specimens of microscopic dimensions. ES2540120 (P201300524). International extensión nº PCT/ES2014/000089 OEPM 27/10/2015. Spain. UCM.