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	**Natalia**		
Family name	**Fernández Borges**		
Gender (*)	**Female**	Birth date(dd/mm/yyyy)	[redacted]
Social Security, Passport, ID number	[redacted]		
e-mail	**natalia.fernandez@inia.csic.es**	URL Web https://www.scopus.com/authid/detail.uri?authorId=57191783529	
Open Researcher and Contributor ID (ORCID) (*)	**0000-0001-6274-0096**		

A.1. Current position

Position	Research scientist in a permanent position		
Initial date	12/12/2023		
Institution	Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria (INIA) - Consejo Superior de Investigaciones Científicas (CSIC)		
Department/Center	Centro de Investigación en Sanidad Animal (CISA)		
Country	Spain	Teleph. number	+34 916202300
Key words	Transmissible spongiform encephalopathies, Prion, PrP, strains, transgenic mice, protein misfolding cyclic amplification		

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

Period	Position/Institution/Country/Interruption cause
2020-2023	Postdoctoral Researcher/CISA-INIA-CSIC/ Spain
2020-2020	Head of Department/Ministerio de Agricultura, Pesca y Alimentación/Spain
2019-2020	**Interruption: Maternity leave/18 months**
2017-2019	Researcher/ Ministerio de Agricultura, Pesca y Alimentación/Spain
2015-2017	Postdoctoral Researcher/CISA-INIA/ Spain
2009-2015	Postdoctoral Researcher/CICbioGUNE/ Spain
2007-2009	Postdoctoral Researcher/The Scripps Research Institute/ USA
2003-2007	Predoctoral Researcher/CReSA/Spain
2002-2003	Predoctoral Researcher/CISA-INIA/ Spain
2001-2002	Research assistant/Universidad de Navarra/Spain
2000-2000	Research assistant/Unidad Investigación Biomédica Hospital Navarra/Spain

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
PhD in Sciences	Universidad Complutense de Madrid	2007
Licensed in Biochemistry	Universidad de Navarra	2002
Licensed in Biology	Universidad de Navarra	2001

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

For over 20 years, my scientific career has been cultivated across various national and international research centers, with a primary focus on the study of prions. This mobility has afforded me the opportunity to investigate and comprehend these incurable and deadly infectious agents from diverse perspectives, collaborating with eminent figures in the field. The contributions throughout my career can be categorized into three major knowledge domains:

a) Unveiling previously unknown basic mechanisms related to the conversion phenomenon in prion diseases.

b) Enhancing understanding and predicting the transmission capacity of prionic agents across different species, including their zoonotic potential.

c) Contributing insights into essential mechanisms for the development of plausible therapeutic strategies, hitherto non-existent.

Some notable impacts of these contributions include demonstrating the susceptibility of species previously considered resistant, such as leporids, to prion diseases. This revelation, recognized by authorities like the European Food Safety Authority (EFSA), has been pivotal in the context of public health. Additionally, identifying determinants governing species resistance to prion infection has shed light on the conversion mechanism and facilitated the development of therapeutic strategies. Notably, breakthroughs in the field of immunotherapeutic strategies disrupting prion tolerance have advanced therapy and prophylaxis against these diseases.

All findings from my scientific journey have been disseminated through peer-reviewed journal publications, national and international conferences, and outreach activities. Active participation in radio and television interviews, informative talks to the livestock sector, and the drafting of popular science articles underscores my commitment to science communication.

The research conducted throughout my career has consistently received funding from competitive projects in which I've been involved as a principal investigator. This cumulative experience has fostered leadership and autonomy in idea development, hypothesis formulation, and results analysis, culminating in recent funding as the principal investigator of an internationally competitive project on prion disease research.

Throughout my scientific journey, I've mentored and supported young researchers, supervising three completed doctoral theses and currently guiding one. Many of my mentees have successfully continued their scientific careers. It's noteworthy that my contributions position me as the 10th among 160 worldwide authors publishing in the field of prion transmission (Scopus). With 52 peer-reviewed contributions, my h-index is on an upward trajectory at 23, accumulating a total of 1417 citations (Scopus). Notably, 71% of my publications involve international collaborations, 86% are published in first-quartile (Q1) journals, and I am the first or second author in 50% of my publications. It's worth mentioning that my contributions have been published in prestigious journals such as The Journal of Clinical Investigation, PNAS, Acta Neuropathologica, etc.

Beyond research publication, I routinely serve as a peer reviewer for scientific articles and evaluate national and international research projects.

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

C.1. Publications *(see instructions)*

Below are the ten most significant contributions from my CV. $^{(CA)}$: corresponding author; $^{(X/Y):\ X}$: position of my authorship, ^{Y}: total number of authors:

1. Vidal E*, **Fernández-Borges N***$^{(1/13)}$, Eraña H, ... Castilla J$^{(CA)}$. Dogs are resistant to prion infection, due to the presence of aspartic or glutamic acid at position 163 of their prion protein. *FASEB J.* 2020;34(3):3969-3982. ***Joint authorship.**

2. Harrathi C*, **Fernández-Borges N***$^{(1/7)}$, Eraña H, ... Castilla J$^{(CA)}$. Insights into the Bidirectional Properties of the Sheep-Deer Prion Transmission Barrier. *Mol Neurobiol.* 2019;56(8):5287-5303. ***Joint authorship.**

3. Fernández-Borges N$^{(1/20)}$, Di Bari MA, Eraña H, ... Castilla J$^{(CA)}$. Cofactors influence the biological properties of infectious recombinant prions. *Acta Neuropathol.* 2018;135(2):179-199.

4. Fernández-Borges N$^{(1/10)}$, Parra B, Vidal E, ... Castilla J$^{(CA)}$. Unraveling the key to the resistance of canids to prion diseases. *PLoS Pathog.* 2017;13(11):e1006716.

5. Fernández-Borges N$^{(1/9)}$, Espinosa JC, Marín-Moreno A, ... Torres J$^{(CA)}$. Protective Effect of Val_{129}-PrP against Bovine Spongiform Encephalopathy but not Variant Creutzfeldt-Jakob Disease. *Emerg Infect Dis.* 2017;23(9):1522-1530.

6. Elezgarai SR*, **Fernández-Borges N***$^{(1/12)}$, Eraña H, ... Castilla J$^{(CA)}$. Generation of a new infectious recombinant prion: a model to understand Gerstmann-Sträussler-Scheinker syndrome. *Sci Rep.* 2017;7(1):9584. ***Joint authorship.**

7. Vidal E*, **Fernández-Borges N***$^{(1/13)}$, Pintado B, ... Castilla J$^{(CA)}$. Transgenic Mouse Bioassay: Evidence That Rabbits Are Susceptible to a Variety of Prion Isolates. *PLoS Pathog.* 2015;11(8):e1004977. ***Joint authorship.**

8. Bett C*, **Fernández-Borges N***$^{(1/7)}$, Kurt TD, ... Sigurdson C$^{(CA)}$. Structure of the β_2-α_2 loop and interspecies prion transmission. *FASEB J.* 2012;26(7):2868-2876. ***Joint authorship**

9. Chianini F*, **Fernández-Borges N***$^{(1/15)}$, Vidal E, ... Castilla J$^{(CA)}$. Rabbits are not resistant to prion infection. *Proc Natl Acad Sci U S A.* 2012;109(13):5080-5085. ***Joint authorship**

10. **Fernández-Borges N***(1/8), Brun A, Whitton JL,… Rodriguez F (CA). DNA vaccination can break immunological tolerance to PrP in *wild-type* mice and attenuates prion disease after intracerebral challenge. J Virol. 2006;80(20):9970-9976.

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

Below, I present ten of my most relevant contributions at conferences:

1. Title: Different strains in human synucleinopathies suggested by a different propagation in a mouse model. Authors: **Fernández-Borges N**., Pitarch J.L., Canoyra S., Rebolledo A.B., Alonso U., Marín-Moreno A., Guerrero C., Ferrer I., Espinosa J.C., Torres J.M. Congress: 9th Iberian Prion Congress. Venue: Jaca, Spain. Date: 12/2021. Type: **Oral presentation**.

2. Title: Human Val_{129} PrP polymorphic variant is a strong molecular protector against BSE zoonotic transmission but fails to prevent human-to-human vCJD transmission. Authors: **Fernández-Borges N.**, Espinosa J.C., Marín-Moreno A., Aguilar-Calvo P., Asante E.A., Andreoletti O., Torres J.M. Congress: 5th Iberian Prion Congress. Venue: Barcelona, Spain. Date: 11/2016. Type: **Oral presentation**.

3. Title: Puzzling out the BSE-human transmission barrier. Authors: **Fernández-Borges N.**, Espinosa JC., Aguilar-Calvo P., Marín-Moreno A., Andreoletti O., Torres JM. Congress: Prion 2016. Venue: Tokyo, Japan. Date: 05/2016. Type: **Oral presentation**.

4. Title: A comprehensive study of the protential resistance of the canidae family to prion infection. Authors: **Fernández-Borges N.**, Parra B., Sánchez-Martín M., Vidal E., de Castro J., Fernández-Fúnez P., Rincón-Limas D.E., Pumarola M., Mayoral T., Castilla J. Congress: 4th Iberian Prion Congress. Venue: Lisbon, Portugal. Date: 12/2015 Type: **Oral presentation**.

5. Title: Infectious recombinant prions: *In vitro* generation and propagation of different strains. Authors: Castilla J., Di Bari MA., Sánchez-Martín MA., Eraña H., Vidal E., Elezgarai SR., Gil D., Vázquez-Fernández E., Harrathi C., Parra B., Espinosa JC., Surewicz W., Torres JM., Mayoral T., Agrimi U., Requena JR., Nonno R., **Fernández-Borges N.** Congress: Prion 2015. Venue: Fort Collins, USA. Date: 05/2015. Type: **Oral presentation**.

6. Title: Infectious recombinant prions: *In vitro* generation and propagation of different strains. Authors: **Fernández-Borges N.**, Di Bari M.A., Sánchez-Martín M.A., Eraña H., Vidal E., Elezgarai S.R., Gil D., Vázquez-Fernández E., Harrathi C., Parra B., Espinosa J.C., Surewicz W., Torres J.M., Mayoral T., Agrimi U., Requena J.R., Nonno R., Castilla J. Congress: 3rd Iberian Prion Congress. Venue: Zaragoza, Spain. Date: 12/2014. Type: **Invited conference.**

7. Title: Generation of a new mouse model showing fast, spontaneous and highly transmissible prion disease. Authors: Eraña H., Geijo M.V., Pintado B., Sevillano A., Vidal E., Elezgarai S.R., Harrathi C., Rodríguez J., Sánchez-Martín M.A., Andrèoletti O., Requena J.R., Juste R.A., Castilla J. Congress: Prion 2014. Venue: Trieste, Italy. Date: 05/2014. Type: **Oral presentation**.

8. Title: Lessons from nature: Prions resistant species and their mechanisms. Authors: **Fernández-Borges N.**, Parra B., Elezgarai S., Vidal, E., Sánchez-Martín M., de Castro J., Vázquez E., Pumarola M., Requena J., Mayoral T., Castilla J. Congress: II Congreso Nacional de Priones. Venue: Madrid, Spain. Date: 12/2011. Type: **Invited conference**.

9. Title: Amplificación cíclica de proteínas mal plegadas *in vitro*. Authors: **Fernández-Borges N.**, de Castro J., Castilla J. Congress: VII Jornadas científico-técnicas en encefalopatías espongiformes animales. Venue: Barcelona, Spain. Date: 11/2009. Type: **Invited conference**.

10. Title: Priones y sistema inmunológico. Authors: **Fernández-Borges N.**, Brun A., Whitton J., Rodríguez F. Congress: IV Jornadas científico-técnicas en encefalopatías espongiformes animales. Venue: Barcelona, Spain. Date: 10/2004. Type: **Invited conference**.

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. Reference: 2023-1317. Title: Prying into prion immunotherapy. Funding entity: Pasqual Maragall Foundation (PMRP 2023 Call). Principal investigator: **Fernández-Borges N.** Organization: CISA-INIA-CSIC. Dates: 2024-2028. Budget: 400000 €. Personal contribution: **Principal investigator**. Project status: Under evaluation.

2. Reference: PCI2023-143384. Title: Classical scrapie in genetically resistant goats: questioning current concepts and policies. Funding entity: Agencia Estatal de Investigación. ICRAD-ERANET 2nd call. ScIce; ID: 59; 2021. Principal investigator: **Fernández-Borges N.** Organization: CISA-INIA-CSIC. Dates: 2022-2026. Budget: 172000 €. Personal contribution: **Principal investigator**. Project status: Granted.

3. Reference: PCI2023-143365. Title: Classical Scrapie in Iceland, a model for prion diseases worldwide. Funding entity. Agencia Estatal de Investigación. ICRAD-ERANET 2nd call. ScIce; ID:54; 2021. Principal investigator: Juan Carlos Espinosa. Organization: CISA-INIA-CSIC. Dates: 2022-2026. Budget: 172000 €. Personal contribution: **Researcher**. Project status: Granted.
4. Reference: PCI2020-120680-2. Title: Tackling Chronic Wasting disease in Europe. Funding entity: Agencia Estatal de Investigación. ICRAD-ERANET 1st call TCWDE. Principal investigator: Espinosa JC. Organization: CISA-INIA-CSIC. Dates: 2021-2024. Budget: 150000 €. Personal contribution: **Researcher**. Project status: Granted.
5. Reference: PID2019-105837RB-I00. Title: Zoonotic potential evolution of emerging prions through the species barrier. Funding entity: Agencia Estatal de Investigación. Principal investigator: Torres Trillo JM and Espinosa JC. Organization: CISA-INIA-CSIC. Dates: 2019-2024. Budget: 193842 €. Personal contribution: **Researcher**. Project status: Granted.
6. Reference: Atyprion 201821-31. Title: Evaluation of the public health risk of atypical and emerging prions. Funding entity: Fundació La Marató de TV3. Principal investigator: Espinosa JC. Organization: CISA-INIA-CSIC. Dates: 2019-2023. Budget: 160000 €. Personal contribution: **Researcher**. Project status: Granted. Completed.
7. Reference: AGL2016-78054-R. Title: Deciphering the molecular mechanisms involved in prion strain diversity and stability. Funding entity: Ministerio de Economía y Competitividad. Principal investigator: Torres Trillo JM and Espinosa JC. Organization: CISA-INIA-CSIC. Dates: 2017-2019. Budget: 150000 €. Personal contribution: **Researcher**. Project status: Granted. Completed.
8. Title: Diagnosis of prion diseases using olfactory ephithelium from nasal scrapings. Funding entity: Departamento de Sanidad del Gobierno Vasco. Principal investigator: Castilla J. Organization: CICbioGUNE. Dates: 2015-2017. Personal contribution: **Researcher**. Project status: Granted. Completed.
9. Title: *In vitro* and *in vivo* dissection of the molecular mechanisms of prion replication by overcoming transmission barriers naturally pre-established. Funding entity: Ministerio de Economía y Competitividad. Principal investigator: Castilla J. Organization: CICbioGUNE. Dates: 2013-2016. Personal contribution: **Researcher**. Project status: Granted. Completed.
10. Title: Characterization of de novo generation of infectious prions. Funding entity: National Institute of Health (NIH). Principal investigator: Castilla J. Organization: The Scripps Research Institute. Dates: 2008-2013. Personal contribution: **Researcher**. Project status: Granted. Completed.

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
1. Type: Contract. Authors: Torres JM, **Fernández-Borges N**, Espinosa JC. Title: Transmissible spongiform encephalopathy (TSE) testing in CHO cells from CEVA. Dates: 2023-2025. Budget: 14000€. Entity: Ceva Santé Animale S.A.
2. Type: Contract. Authors: **Fernández-Borges N**., Castilla J. Title: Inactivación de priones infecciosos en una cámara de ozono. Dates: 2015-2015. Entity: SEDECAL-Soc. Esp. De electromedicina y calidad SA in collaboration with Foothills Medical Centre (Calgary, Alberta, Canada).
3. Type: Contract. Authors: Espinosa JC, **Fernández-Borges N**., Torres JM. Reference: CON14-043. Title: Testing decontamination procedures against prion infectivity. Dates: 2015-2018. Budget: 56400 €. Entity: INRA and Franklab (France).
4. Type: Contract. Authors: Espinosa JC, **Fernández-Borges N**., Torres JM. Reference: CON14-004. Title: Evaluación de la capacidad de eliminación de la infectividad de los agentes causantes de EETs de la etapa de cromatografía de intercambio iónico (DEAE celulosa) de los procesos de producción de profilnine®sd y alphanine®sd de Grifols. Dates: 2014-2017. Budget: 118000 €. Entity: GRIFOLS BIOLOGICALS INC.
5. Type: Patent. Authors: Marques J., Pérez E., **Fernández-Borges N.,** Rodríguez F. Reference: WO 2008/129103 Al. Title: Use of african swine pest haemoglutinin as an adjuvant. Date: 2008. Status: Not in use. Entity: Centre de Recerca en Sanitat Animal (CReSA).
6. Type: Patent. Authors: Rodríguez F., **Fernández-Borges N**., Brun A., Whitton L. Reference: ES 2 259 550 A1. Title: Procedimiento y estrategias vacunales para potenciar la respuesta inmune contra priones tras la vacunación, kits de diagnóstico y composiciones farmacéuticas para la profilaxis y tratamiento de encefalopatías espongiformes. Date: 2006. Status: Not in use. Entity: Centre de Recerca en Sanitat Animal (CReSA).