



CARMEN M. FERNANDEZ-MARTOS

*Group leader of Neurometabolism research group (Spain)*

*Honorary Adjunct Researcher. University of Tasmania (Australia)*

**Date of birth:** 27<sup>th</sup> July 1979 **Research Gate:** [https://rmdb.research.utas.edu.au/public/rmdb/q/indiv\\_detail\\_warp\\_trans/34902](https://rmdb.research.utas.edu.au/public/rmdb/q/indiv_detail_warp_trans/34902)

**Nationality:** Spanish **Research Group Gate:** <https://hnparaplejicos.sanidad.castillalamancha.es/en/profesionales/investigacion/basica/neurometabolismo>

**Researcher ID:** J-7770-2014 **ORCID code:** 0000-0002-6387-4456

## **EDUCATION**

**2012:** Accreditation as assistant professor. National Agency for Quality Assessment and Accreditation of Spain (ANECA).

**2003 – 2007:** PhD in Chemistry. *Suma Cum Laude* (maximum mark in the Spanish University system). University of Castilla-La Mancha (UCLM), Spain.

**2004 – 2005:** Biochemistry, Molecular Biology and Biomedicine MSc. in University Autonoma of Madrid (UAM), (Spain).

**1998 – 2001:** Biology B.Sc. in University of Jaen (UJA), (Spain).

## **PREVIOUS POSITIONS**

2018 – 2019: **Principal Investigator.** Neuroimmuno-repair group (GNIR). UDI-HNP (Spain).

2017 – 2018: **Senior Researcher.** Neuroimmuno-repair group (GNIR). UDI-HNP (Spain).

2013 – 2016: **Postdoctoral Fellowship.** University of Tasmania (Australia).

2009 – 2012: **Postdoctoral Fellowship.** Molecular Neuroprotection group (GMN). UDI-HNP (Spain).

2008 – 2009: **Postdoctoral Fellowship.** Molecular Neurology group (NRML). UDI-HNP (Spain).

2003 – 2007: **PhD student.** UCLM & Regional Centre of Scientific Biomedical Research (CRIB), (Spain).

## **FELLOWSHIPS AND AWARDS**

- 2018: **Grant** for the attraction of PIs in research groups, to open new research lines within the Community of Castilla-La Mancha. On Sep. of 2018, I granted one of the 7 high competitive grants to open my own research line to investigate pathological mechanisms in ALS/FTD at the UDI-HNP.
- 2017: **Senior Fellowship** for the attraction of talent in research groups within the JCCM. On July 2017, I granted one of the 6 high competitive research position, for hiring experienced doctors, to join the GNIR lab at the UDI-HNP. I achieved the 2<sup>nd</sup> out of 100 applicants (98/100 points).
- 2016: **Seal of Excellence**. Marie Sklodowska-Curie Actions (call h2020-msca-if-2016), European Union.
- 2015: **Research conference support scheme (RCSS)**. University of Tasmania (Australia).
- 2011: **Award on Biomedical Research**. Castilla-La Mancha Social Health-Care Foundation (FSCLM).
- 2008: **Marie Sklodowska-Curie Conferences & Training Courses**. University of Rostock (Germany).
- 2004: **Scholarship for PhD student mobility**. Spanish Government.
- 2003: **Pre-doctoral Scholarship (FPI)**. Junta de Comunidades de Castilla-La Mancha (JCCM).

## **TEACHING ACTIVITIES**

- 2020:** UAM Master in Neuroscience, Madrid (Spain). Subject: Neuroimmunology. Lecturer title: “Neuroimmune interactions in neurodegenerative diseases: Alzheimer’s disease (AD) and Amyotrophic Lateral Sclerosis (ALS)”.
- 2013 – 2016:** Neuroscience (CHP311/312), Biochemistry (CBA344) and Bachelor in Dementia, University of Tasmania (Australia). Lecturer title: The Art & Science of Clinical Trials (CAD303). Additionally, I have developed practical and tutorials, including marking assessments in undergraduate units offered by the School of Medicine at the University of Tasmania (Australia).

## **SUPERVISION OF GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS**

- 2021 – :** Postdoctoral Fellow (Sara Borrell Fellowship Programme, ISCIII. Under evaluation)/ Dr Ana Contreras.
- 2015 – 2019:** 2019 *Dr Kelsey Hanson (Research Associate - Division of Neuroscience and Experimental Psychology, University of Manchester)*. Role: Co-supervisor.
- 2018 – 2021:** 2 ungraduated Biochemistry projects (*TFG*), (*Spain*).
- 2013 – 2015:** 6 ungraduated Biochemistry projects (Australia).
- 2014 – 2015:** 2 Master students (Australia).

## **PATENTS**

- 2016:** AU2016902618. **Inventors:** C.M. Fernandez-Martos, J. Vickers, A. King. **University of Tasmania**
- 2013:** ES2395370. **Inventors:** C.M. Fernandez-Martos, F.J. Rodriguez. **FUHNPAIIN (Spain)**.

## **ORGANISATION OF SCIENTIFIC MEETINGS**

- 2018 – 2019:** Organizer of the Internal Brain Awareness Week. UDI-HNP (Spain).
- 2018:** Oral/Poster Judging Subcommittee. XV Simposio de Jóvenes Investigadores de la RSEQ (Spain).
- 2016:** Oral/Poster Judging Subcommittee. Australian Neuroscience Society (ANS) conference. Tasmania (Australia).
- 2015:** Poster Judging Subcommittee. Wicking Dementia Research and Education Centre (Australia).

## **REVIEWING ACTIVITIES**

2018 – : **Reviewer** *Annals of Neurology* (IF: 10.25) and *Acta Neuropathologica Communications* (IF: 5.14).

2016 – : **Reviewer** *Neurobiology of Disease* (IF: 5.14). 2017 –: **Reviewer** *Neurotherapeutics* (IF: 5.72).

## **INSTITUTIONAL RESPONSIBILITIES**

**2019** – : Head of Neurometabolism research group. UDI-HNP, Toledo (Spain).

**2018** – : Member of the Scientific Divulcation Committee “Ciencia a la carta”. UCLM (Spain).

**2018** – **2019**: Member of the Communication and Dissemination Committee. UDI-HNP, Toledo (Spain).

**2017** – **2018**: Member of a Scientific Committee (Advisor). UDI-HNP, Toledo (Spain).

## **RESEARCH LEADERSHIP**

I am the group leader of Neurometabolism laboratory at the HNP (Spain). My most important achievements and merits are the consequence of my competitive work in the field of neuroscience. In 2018, I was awarded a high competitive grant for the attraction of talent within the JCCM, to develop, as PI, a pioneer research line in Spain focusing on determine the implications of leptin alterations in the pathogenesis of ALS. Then, in 2019, I was awarded a prestigious Biomedicine research grant from the "la Caixa" Foundation (<https://metabolep.com/>), establishing my own group within the HNP. This call is extremely competitive since they have a success rate of 5%. During this two years, I have secured more than 615.500 € of funds from regional and national agencies to sustain my laboratory, which, nowadays, is actively contributing to national competitiveness producing excellent results in the field of ALS.

## **MEMBERSHIPS OF SCIENTIFIC SOCIETIES**

**2018** –: Spanish Society of Neuroscience (SENC).

**2017** –: The Spanish Network of Multiple Sclerosis (REEM).

**2015** –: Spanish Researchers in Australia-Pacific (SRAP/IEAP); Australasian Neuroscience Society (ANS); International society of Neurochemistry (ISN).

**2011** –: Federation of European Neuroscience Societies (FENS).

## **CAREER BREAKS**

**2016** – **2017**: Maternity break (March-November, 16 month).

## **PUBLICATIONS**

### **2021**

-A. Ferrer-Donato, José M. Méndez-Arriaga, Diana Díaz-García, M. Cabrera Pinto, Miguel Díaz-Sánchez, Sanjiv Prashar, Carmen M. Fernandez-Martos & Santiago Gómez-Ruiz *Exploring mesoporous silica nanoparticles as a single platform for the treatment of Amyotrophic Lateral Sclerosis (ALS) with a therapeutic cocktail based on leptin and pioglitazone*. Applied Materials Today, 2021 (In preparation).

-Agueda Ferrer-Donato, Ana Contreras, Laura M. Frago, Julie A Chowen, Carmen M. Fernandez-Martos. *Alterations in leptin signaling in Amyotrophic Lateral Sclerosis (ALS)*. Neurobiology of Disease, 2021 (Submitted).

-A. Ferrer-Donato, A. Contreras, P. Fernandez, Carmen M. Fernandez-Martos. *Effect of Leptin Treatment in a Mouse Model of Tdp-43 Proteinopathy*. (IJMS) 2021 (doi:10.20944/preprints202104.0041.v1).

-A.Rodriguez, A.Ferrer-Donato, M.Cabrera-Pinto, S.Seseña, P.Fdez, A.Aranda, Carmen M. Fernandez-Martos. *Effect of ozone exposure on ALS pathology using a mice model of TDP-43 proteinopathy*. Environmental Pollution 2021 doi: <https://doi.org/10.1101/2021.02.12.430915>.

## **2020**

-C. Alvaro-Alonso, A. Ferrer-Donato, E. Fernández-Torres, M. Carballo-Villa, Carmen M. Fernandez-Martos. *Methodology Aspects of Colony Maintain for a Murine Model ALS TDP-43 Proteinopathy*. Animals 2020;10(12):2329.

-Yao Liu, Kelsey A. Hanson, Graeme McCormack, Justin Dittmann, James C. Vickers, Anna E. King and Carmen M. Fernandez-Martos. *Enhanced anti-amyloid effect of combined leptin and pioglitazone in APP/PS1 transgenic mice*. Curr Alzheimer Res 2020;17(14):1294-1301. doi: 10.2174/1567205018666210218163857.

## **2018**

-Woodhouse A, Fernandez-Martos CM, Atkinson RAK, Hanson K, Collins JM, O'Mara A, Terblanche N, Skinner M, Vickers JC, King AE. *Repeat propofol anesthesia does not exacerbate plaque deposition or synapse loss in APP/PS1 Alzheimer's disease mice*. BMC Anesthesiology. 2018. In Press

-María Rodríguez, Cristina Pintado, Eduardo Moltó, Nilda Gallardo, Carmen M. Fernández-Martos, Virginia López, Antonio Andrés and Carmen Arribas. *Hypothalamic s-resistin deficiency ameliorates central inflammation and increases whole body insulin sensitivity*. Sci Rep. 2018 Mar 2;8(1):3921. doi: 10.1038/s41598-018-22255-3.

-Anna E. King, Anna Brain, Kelsey Hanson, Justin Dittmann, James C. Vickers, Carmen M. Fernandez-Martos\*. *Disruption of leptin signalling in a mouse model of Alzheimer's disease*. Metabolic Brain Disease. 2018 Mar 15. doi: 10.1007/s11011-018-0203-9. (\*Corresponding author).

## **2017**

-Kelsey Hanson, Carmen M. Fernandez-Martos, James C Vikers, Anna E. King. *The role of microtubules in excitotoxin-induced axon degeneration*. Alzheimer's and Dementia. 2017 July; 13(7):P953. doi: 10.1016/j.jalz.2017.06.1268

-Stuart KE, King AE, Fernandez-Martos CM, Dittmann J, Summers MJ, Vickers JC. *Environmental novelty exacerbates stress hormones and A $\beta$  pathology in an Alzheimer's model*. Sci Rep. 2017 Jun 5;7(1):2764. doi: 10.1038/s41598-017-03016-0.

-Stuart KE, King AE, Fernandez-Martos CM, Dittmann J, Summers MJ, Vickers JC. *Mid-life environmental enrichment increases synaptic density in CA1 in a mouse model of A $\beta$ -associated pathology and positively influences synaptic and cognitive health in healthy ageing*. J Comp Neurol. 2017 Jun 1;525(8):1797-1810. doi: 10.1002/cne.24156.

## **2016**

-Carmen M. Fernandez-Martos\*, Rachel Atkinson, Meng Inn Chuah, Anna King, James C. Vickers. *Combination treatment with leptin and pioglitazone in a mouse model of Alzheimer's disease*. Alzheimer's & Dementia (N Y). 2016 Dec 20;3(1):92-106 (\*Corresponding author).

## **2015**

-Yao Liu, Rachel Atkinson, Carmen Fernandez-Martos, Matthew Kirkcaldie, Tracey C. Dickson, James C. Vickers, Anna King. *Changes to TDP43 expression in young adult and aging neurofilament light protein knockout mice*. Neurobiol Aging. 2015; 36(2):1151-9. doi: 10.1016/j.neurobiolaging.2014.10.001.

-Carmen M. Fernandez-Martos\*, Anna E. King, Rachel A.K. Atkinson, Adele Woodhouse, James C. Vickers. *Neurofilament light gene deletion exacerbates amyloid, dystrophic neurite and synaptic pathology in the APP/PS1 transgenic model of Alzheimer's disease*. *Neurobiology of Aging*. 2015. 36(10):2757-67 (\*Corresponding author).

-Atkinson RA, Fernandez-Martos CM, Atkin JD, Vickers JC, King AE. *C9ORF72 cellular localization and expression over mouse development*. *Acta Neuropathologica Communications*. 2015. 25;3:59. doi: 10.1186/s40478-015-0238-7

## **2014**

-Carlos Gonzalez-Fernandez; Carmen Fernandez-Martos; SD Shields; E Arenas; FJ Rodriguez. *Wnts are expressed in the spinal cord of adult mice and are differentially induced after injury*. *Journal of Neurotrauma* 2014. 31 -6, pp. 565 - 581.

## **2013**

-Pau Gonzalez Sanchez; Carmen Fernandez-Martos; Ernest Arenas; Francisco Javier Rodriguez Muñoz. *The Ryk receptor is expressed in glial and fibronectin-expressing cells after spinal cord injury*. *Journal of Neurotrauma* 2013. 30 -10, pp. 806 - 817.

## **2012**

-\*Pau Gonzalez Sanchez; \*Carmen Maria Fernandez-Martos; \*Carlos Gonzalez-Fernandez; Ernest Arenas; Francisco Javier Rodriguez Muñoz. *Spatio-temporal expression pattern of Frizzled receptors after contusive spinal cord injury in adult rats*. *PLoS One* 2012. 7 - 12, pp. 1 - 18. (\*co-first authors).

-Carmen Maria Fernandez-Martos; Pau Gonzalez Sanchez; Francisco Javier Rodriguez Muñoz. *Acute leptin treatment enhances functional recovery after spinal cord injury*. *PLoS One* 2012. 7 - 4, pp. 1 - 15.

## **2011**

-Carmen Maria Fernandez-Martos; Carlos Gonzalez-Fernandez; Pau Gonzalez-Sanchez; Alfredo MaquedaFernandez; Ernest Arenas; Francisco Javier Rodriguez Muñoz. *Differential expression of Wnts after spinal cordcontusion injury in adult rats*. *PLoS One* 2011. 6 - 11, pp. 1 - 11.

## **2010**

-Wolfgang Pita-Thomas; Carmen Fernandez-Martos; Monica Yunta; Rodrigo M. Maza; Rosa Navarro-Ruiz; Marcos Javier Lopez-Rodriguez; David Reigada; Manuel Nieto-Sampedro; Manuel Nieto-Diaz. *Gene expression of axon growth promoting factors in the deer antler*. *PLoS One* 2010. 5 - 12, pp. 1 - 13.

-CM Fernandez; A del Arco; N Gallardo; L Aguado; M Rodriguez; M Ros; JM Carrascosa; A Andres; C Arribas. *S-resistin inhibits adipocyte differentiation and increases TNFalpha expression and secretion in 3T3-L1 cells*. *Biochimica et Biophysica Acta (BBA) - Molecular Cell Research* 2010. 1803 - 10, pp. 1131 - 1141.

-M. Nieto-Diaz; W. Pita-Thomas; R. M. Maza; M. Yunta-Gonzalez; M. J. Lopez-Rodríguez; R. Navarro-Ruiz; D. Reigada; C. Fernandez-Martos; M. Nieto-Sampedro. *Factors promoting axon growth in the deer antler*. *Animal Production Science* 2010. 51 - 4, pp. 351 - 354.

## **Reviews**

-JC Vickers, A Woodhouse, CM Fernandez-Martos, MT Kirkcaldie, AJ Canty, GH McCormack, AE King. *Defining the earliest pathological changes of Alzheimer's disease*. *Curr Alzheimer Res*. 2016; 13(3):281-7.

## **GRANTED RESEARCH PROJECTS**

### **Research projects as principal investigator (PI) or co-principal investigator (Co-PI)**

**2020 - 2022:** METABOLEP: *A potential metabolic-targeted therapeutic for Amyotrophic lateral sclerosis (ALS): Leptin*. Biomedicine and Health research grants, "La Caixa" Banking Foundation Actions, Spain. **Total amount:** 500.000 €. **Role: PI and coordinator.**

**2018 - 2020:** *Linking TDP-43 pathology and leptin to ALS: Implications of metabolic alterations in the pathogenesis and treatment*. Consejería de Educación, Cultura y Deportes de Castilla-La Mancha (JCCM), Spain. **Total amount:** 115.500 €. **Role: PI.**

**2015:** *'Axon protection in Alzheimer's disease'*. **The Judith Jane Mason & Harold Stannett Williams Memorial, Australia.** **Total amount:** 38.316 €. **Role: Co-PI.**

**2014:** *'Leptin and Pioglitazone: a new potential therapeutic intervention for Alzheimer disease (AD)'*. **Early Career Researcher grants (ECRG).** University of Tasmania (UTAS). Hobart, Australia. **Total amount:** 3.241 €. **Role: PI.**

**2013:** *'Characterization of the physiological effect of neurofilament light subunit (NFL) protein deficiency in Alzheimer's disease pathology: a new therapeutic target for neurodegenerative disease'*. **Research Enhancement grants (REGS),** Australia. **Total amount:** 9.401 €. **Role: PI.**

### **Research projects as research associated (RA)**

**2009 - 2012:** *'Neuroprotección y reparación de lesiones traumáticas de médula espinal mediante la administración combinada de fármacos y trasplantes de glía envolvente adulta'*. Fondo de Investigaciones Sanitarias. Instituto de Salud Carlos III, Spanish Government. **Total amount:** 153.971 €. **Role: RA.**

**2009 - 2011:** *'Estudio del papel de la proteína inhibidora de apoptosis XIAP en nuevas terapias neuroprotectoras'*. Fondo de Investigación Sanitaria (FIS), Spanish Government. **Total amount:** 80.596 €. **Role: RA.**

**2009 - 2011:** *'Identificación y caracterización de los miRNAs mediadores de la actividad apoptótica de la familia IAP y su potencial terapéutico en la lesión secundaria de médula espinal'*. Fundación para la Investigación Sanitaria en Castilla-La Mancha (FISCAM). Spanish Government. **Total amount:** 114.335 €. **Role: RA.**

**2008:** *'Los miRNAs neuroprotectores en la lesión neurotraumática de la médula espinal'*. Mapfre Foundation. Spanish Government. **Total amount:** 15.000 €. **Role: RA.**