

**CURRICULUM VITAE ABREVIADO (CVA)**

**Part A. PERSONAL INFORMATION**

First name	MARTA		
Family name	ARTAL SANZ		
Gender	██████	Birth date	██████
Social Security, Passport, ID number	██████████		
e-mail	martsan@upo.es		URL Web
Open Researcher and Contributor ID (ORCID) (*)	0000-0003-1126-0492		

**A.1. Current position**

Position	Profesora Titular de Universidad/Assistant Professor Scientific Vicedirector of the Andalusian Centre for Developmental Biology		
Initial date	22/12/2023		
Institution	Universidad Pablo de Olavide		
Department/Center	Andalusian Centre for Developmental Biology (CABD)		
Country	Spain	Teleph. number	666130686
Key words	Molecular, cellular and genetic biology, genomics, aging, metabolism, mitochondria		

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

Period	Position/Institution/Country/Interruption cause
2017-2023	Prof. Contratada Doctora. Universidad Pablo de Olavide
2012-2017	Group Leader Position (Ramón y Cajal)/Andalusian Centre for Developmental Biology (CABD)/Spain.
2010-2012	Senior Researcher Group Leader Position./Albert-Ludwigs-University of Freiburg/Germany.
2008-2010	Post-doctoral researcher (Juan de la Cierva)/IBV (CSIC)/Spain.
2005-2008	Post-doctoral researcher (Mari Curie-IEF)/ IMBB (FORTH)/Crete, Greece
2004-2005	Post-doctoral researcher/University of Amsterdam/The Netherlands

**A.3. Education**

PhD, Licensed, Graduate	University/Country	Year
PhD in Science	University of Amsterdam	2003
Postgraduate Studies	University of Amsterdam	1997-1999
Graduate (BSc+MSc equivalent)	Universitat de València	1996

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

**1. Scientific Contributions:** Artal-Sanz heads a laboratory at the Andalusian Centre for Developmental Biology (CABD) since 2012. She earned her PhD degree at the University of Amsterdam, focusing on the study of mitochondrial proteins linked to human disease. She focused on the mitochondrial Prohibitin (PHB) complex, a highly evolutionarily conserved complex, associated with ageing in yeast and cancer in humans. Her investigation using *S. cerevisiae* led to a breakthrough hypothesis for the functioning of the PHB complex as a membrane bound chaperone (*EMBO J.* co-1<sup>st</sup> author). She decided to investigate the role of PHB proteins in the development of a multicellular organism and chose *C. elegans* as a model system. She established the model at the University of Amsterdam and published a *J. Biol. Chem.* paper as first and only corresponding author. She gathered funding from the EU (**Marie Curie EIF**) to go to the laboratory of Prof. Tavernarakis (IMBB-FORTH, Greece). There, she investigated the role of lysosomes in *C. elegans* neurodegeneration (*J. Cell Biol.* 1<sup>st</sup> author). In parallel, she focused on the role of mitochondrial PHBs in lifespan determination using *C. elegans* as a model system. This work revealed a previously unsuspected and strikingly opposing function of the PHB complex in ageing, depending on intrinsic and extrinsic cues. This work culminated in a first and



corresponding author publication at *Nature* (2009), with Taveranarakis as only co-author. Her findings brought a new twist into the ageing field, which now serves as a basis for her continuing research.

In 2010 she obtained a Group Leader Position at the University of Freiburg, Germany. There she developed the bases of a solid project and obtained funds from the European Research Council. In March 2012, she repatriated to Spain with a **Ramón y Cajal** contract and an **ERC\_StG**. She gathered funds from the Junta de Andalucía and the Spanish Ministry and attracted a postdoctoral fellow that joined the lab with a Marie Curie IEF. She has been awarded an **ERC\_PoC** to find drugs that will ameliorate infertility associated to defective Insulin/IGF-1 signalling (IIS). Her laboratory focuses in understanding the crosstalk between mitochondria and cellular signalling networks, with a special focus on IIS in the regulation of ageing by applying a multidisciplinary approach involving genome-wide imaging screens, metabolomics, transcriptomics and functional genomics in *C.elegans*. Her investigations revealed several epigenetic factors as regulators of the differential response triggered by PHB depletion in wild type and IIS mutants. During her last project (**PID2019-104145GB-I00**) she focused in the conserved heterochromatin protein 1 (HP1) family. This research revealed that the genome-wide chromatin binding profile of HPL-1, one of the HP1 orthologs in *C.elegans*, differs between the conditions leading to opposing aging phenotypes upon PHB depletion. The study revealed an interesting link with another candidate isolated in a genome-wide imaging screen carried out in the lab (*BMC Biol.* corresponding author and a manuscript in preparation), which will be the focus of her immediate future research (**PID2022-139772NB-I00**).

Artal-Sanz is author of **35 peer-reviewed papers, some published in major generalist and specialised journals**. Among them, as corresponding author: 1 **Nature**, 1 **Aging-US**, 1 **TRENDS Endocrin. Met.**, 1 **BMC Biol.**, 1 **Nature Sci. Rep.**, 1 **J. Biol. Chem.**, 1 **BBA-Bioenergetics**, 1 **PLoS One**, 1 **Cells**, 1 **Front. Physiol.**, 1 **Metabolites**, 1 **Front. Aging**, 1 **iScience** and 2 **Aging Cell**, and as senior scientist through collaborations: 1 **Nat. Comm.**, 1 **Nat. Biotechnol.**, 1 **Cell Host & Microbe**, 1 **Apoptosis** and 2 **Genetics**.

**2. Societal Contributions:** She is also actively involved in dissemination activities such as: “The week of Science” and “La Noche Europea de los Investigadores”. She has organised Workshops and been Speaker at the ERC=Science2 project. Round table: “Longevidad ¿Quien quiere vivir eternamente?” Parque de las Ciencias, Granada, and at the Fab-Lab about longevity. Parque de las Ciencias, Granada.

**3. Role in shaping young scientists:** She has mentored a total of 10 postdoctoral researchers (7 national and 3 international) which are currently continuing their careers in academia (Institut Jacques Monod-Université Paris Diderot/CNRS, University of Freiburg, University of Lisbon, University Pablo de Olavide and University of Seville) Biotech industry (Medical Science Liaison at Janssen) or as co-founder of biotech company, attaining an independent research or academic position. In addition, she has mentored 3 PhDs (one now at UCL- University College London and one teaching in academia and one a Postdoctoral Juan de la Cierva). Recently, she attracted a postdoctoral fellow (June 2022) within the Maria Zambrano framework (European Union “NextGenerationEU,” and Ministry of Universities) that started as Junior **Ramón y Cajal** in 2023 in her lab.

Artal-Sanz actively participates as Reviewer for national (Plan Nacional) and international grants (Israel Science Foundation and Flanders Research Foundation) and as a Review Editor (Frontiers and Cells) and Reviewer for several journals (e.g.: Frontiers, PLOS One, G3, Aging Cell, BMC Biol, Methods in Cell Biol, and EMBO Mol Med).

**4. Other relevant contributions:** 3 Sexenios: (last period 2013-2018, date 13/06/2019). Total cites: 2,379 (WoS). Publications in Q1: 28. h-index: 21

## **Part C. RELEVANT MERITS**

### **C.1. Publications (CA-Corresponding author)**

- 35-** Giovannetti M, Rodríguez-Palero MJ, Fabrizio P, Nicolle O, Bedet C, Michaux G, Witting M, **Artal-Sanz M (CA)**, Palladino F(CA). SIN-3 transcriptional coregulator maintains mitochondrial homeostasis and polyamine flux. **iScience**. 2024 Apr 22;27(5):109789. doi: 10.1016/j.isci.2024.109789.
- 34-** de la Cruz-Ruiz P, Rodríguez-Palero MJ, Askjaer P (CA), **Artal-Sanz M (CA)** (4/4) (2023). Tissue-specific chromatin binding patterns of *C. elegans* heterochromatin proteins HPL-1 and HPL-2 reveal differential roles in the regulation of gene expression. **Genetics**. 2023 Apr 29;iyad081. doi: 10.1093/genetics/iyad081
- 33-** Fernández-Abascal J (CA) and **Artal-Sanz M (CA)** (2/2) (2022). Prohibitins in neurodegeneration and mitochondrial homeostasis, **Frontiers in Aging**. Nov 3;3:1043300. doi:10.3389/fragi.2022.1043300



- 31- Lourenço A, Rodríguez-Palero MJ, Doherty MK, **Artal-Sanz M (CA)** (9/9) (2021). The Mitochondrial PHB Complex Determines Lipid Composition and Interacts With the Endoplasmic Reticulum to Regulate Ageing. **Frontiers in Physiology**. Jul 1;12:696275. doi:10.3389/fphys.2021.696275
- 30- de la Cruz-Ruiz P, Hernando-Rodríguez B, Perez-Jimenez MM, Rodríguez-Palero MJ, Martínez-Bueno MD, Pla A, Gatsi R, **Artal-Sanz M (CA)** (2021) Prohibitin depletion extends lifespan of a TORC2/SGK-1 mutant through autophagy and the UPR<sup>mt</sup>. **Aging Cell**. May;20(5): e13359 doi:10.1111/accel.13359
- 29- Pérez-Jiménez MM, Sansigre P, Valladares A, Muñoz MJ (CA) (11/13) (2021). Steroid hormones sulfatase inactivation extends lifespan and ameliorates age-related diseases. **Nature Commun**. Jan 4;12(1):49. doi: 10.1038/s41467-020-20269-y
- 26- Olmedo M (CA), Mata-Cabana A, Rodríguez-Palero MJ, García-Sánchez S, Fernández-Yañez A, Merrow M and **Artal-Sanz M (CA)**. (2020) Prolonged quiescence delays somatic stem cell-like division in *Caenorhabditis elegans* and is controlled by insulin signalling. **Aging Cell** Dec 19(2):e13085. doi: 10.1111/accel.13085.
- 24- Zhang J, Li X, Olmedo M, Holdorf AD, Shang Y, **Artal-Sanz M**, Yilmaz LS, Walhout AJM (CA) (2019). A Delicate Balance between Bacterial Iron and Reactive Oxygen Species Supports Optimal *C. elegans* Development. **Cell Host Microbe**. Aug 14. pii: S1931-3128(19)30354-3. doi: 10.1016/j.chom.2019.07.010.
- 20- Hernando-Rodríguez B, Erinjeri AP, Rodríguez-Palero MJ, **Artal-Sanz M (CA)** (11/11) (2018). Combined flow cytometry and high-throughput image analysis for the study of essential genes in *Caenorhabditis elegans*. **BMC Biology**. Mar 29;16(1):36. doi: 10.1186/s12915-018-0496-5
- 19- Rodríguez-Palero MJ, López-Díaz A, Marsac R, Gomes JE, Olmedo M. and **Artal-Sanz M (CA)**. (2018). An automated method for the analysis of food intake behaviour in *Caenorhabditis elegans*. **Nature Scientific Reports**, 1–10. Feb 26;8(1):3633. doi: 10.1038/s41598-018-21964-z
- 16- Bastos Lourenço A, Muñoz Jiménez C, Venegas Calerón M, and **Artal-Sanz M (CA)**. (2015). Analysis of the effect of the mitochondrial prohibitin complex, a context-dependent modulator of longevity, on the *C. elegans* metabolome. **BBA-Bioenergetics**, 2015 Nov;1847(11):1457-68 doi:10.1016/j.bbabi.2015.06.003.
- 13- **Artal-Sanz M (CA)**, and N. Tavernarakis (CA). (2009). Prohibitin couples diapause signalling to mitochondrial metabolism during ageing in *C. elegans*. **Nature**, 461: 793-7. doi:10.1038/nature08466

## **C.2. Congresses, (Presenter underlined)**

**Invited Speaker** at the **EMBO/FEBS Lecture Course “Mitochondria in life, death and disease”**. Heterochromatin Protein 1 controls gene expression and longevity in response to mitochondrial dysfunction. 16-20 September 2024, Lanshut, Germany

De La Cruz Ruiz P, Heluani Gahete H, Ortega De La Torre MA, Rodríguez Palero MJ, Ayuso García C, Ohta S, Askjaer P and **Artal-Sanz M**. “Heterochromatin Protein 1 controls gene expression and longevity in response to mitochondrial dysfunction”. **Oral presentation at Euromit 2023. International Meeting on Mitochondrial Pathology**. 11-15 June 2023. Bologna, Italy.

De La Cruz Ruiz P, Heluani Gahete H, Ortega De La Torre MA, Rodríguez Palero MJ, Ayuso García C, Ohta S, Askjaer P and **Artal-Sanz M**. “Heterochromatin Protein 1 controls gene expression and longevity upon prohibitin depletion”. **Oral presentation at the 24th International C.elegans Conference**. 24-28 June, 2023, Glasgow, Scotland.

De La Cruz Ruiz P, Heluani-Gahete H, Ortega De La Torre MA,...Askjaer P, **Artal-Sanz M**. “Heterochromatin Protein 1 controls gene expression and longevity in response to mitochondrial dysfunction”. **Poster presentation at the Cell Symposia: Multifaceted Mitochondria**. Seville. Spain. November 6-8, 2022

De La Cruz Ruiz P, Askjaer P and **Artal Sanz M**. “Heterochromatin protein 1 and prohibitins regulate longevity and the Mitochondrial Unfolded Protein Response”. **Poster presentation at the Virtual 23<sup>rd</sup> International C. elegans Conference**. University of California. Los Angeles. U. S. A. June 21-24, 2021





De La Cruz Ruiz P, Askjaer P and Artal Sanz M. “Heterochromatin protein 1 and prohibitins regulate longevity and the Mitochondrial Unfolded Protein Response”. **Poster presentation at the EMBL Conference: Chromatin and epigenetics.** 17-20 May 2021.

Artal-Sanz M. “Prohibitin depletion extends lifespan of aTORC2/SGK-1 mutant by suppressing autophagy defects”. **Oral presentation at the Virtual European Worm Meeting 2020.** 22-23 June 2020.

García-Rodríguez FJ, Paul Erinjeri A, Bastos Lourenço A, Doherty M, Whitfield P, Askjaer P, Artal-Sanz M. “GSK-3 intestinal activity impacts mitochondrial function and ageing”. **Oral presentation at the EMBO Workshop C. *elegans* development, cell biology and gene expression and European Worm Meeting (EWM).** Barcelona, 13–17 June, 2018

Artal-Sanz M. “Investigating Prohibitin genetic interactions in the regulation of ageing and the mitochondrial unfolded protein response”, **Oral presentation at the EMBO Workshop: Developmental circuits in aging.** Heraklion, Crete, Greece, 25-28 May. 2015

Hernando-Rodriguez B, Millar V, Jarit-Cabanillas A, Manchada H, Kaderali L, Artal-Sanz M. Identification of new pathways involved in the regulation of the UPRmt reveals a crosstalk between mitochondrial stress response and insulin signaling. **Oral presentation at the 21<sup>st</sup> International C. elegans Conference.** University of California. Los Angeles. U. S. A. June 21-25 2017

### **C.3. Research projects. As Principal Investigator since 2012:**

**PID2022-139772NB-I00:** “Mitochondrial stress signalling: the role of histone deubiquitination in ageing regulation” (MITDUBAGE) PI: Marta Artal-Sanz. Funding Institution: Spanish Ministry of Science and Innovation, Agencia Estatal de Investigación (AEI) (01/09/2023-31/08/2026). Total amount: 175.000€ and one PhD funded position (FPI)(**PRE2023-PID2022-139772NB-I00**).

**P20\_00873:** “The role of chromatin regulators in mitochondrial unfolded protein response and longevity”. PI: Marta Artal-Sanz\_University Pablo de Olavide. Funding institution: Consejería de Transformación Económica, Industria, Conocimiento y Universidades de la Junta de Andalucía (04/10/2021- 31/12/2022). Total amount: 45.995€

**PID2019-104145GB-I00.** Mitochondrial stress signalling: from epigenetic modifications to ageing regulation (EPIMITAGE). PI: Marta Artal-Sanz. Funding Institution: Spanish Ministry of Science, Innovation and Universities, Agencia Estatal de Investigación (AEI) (01/06/2020-31/05/2023). Total amount: 119.790€

**FEDER 2014-2020/UPO-1260918.** “Mitochondrial stress signaling: from epigenome to ageing”. PI: Marta Artal-Sanz, co-PI: Peter Askjaer. Funding institution: Fondo Europeo de Desarrollo Regional-Universidad Pablo de Olavide (01/01/2019-31/12/2021). Total amount: 33.750€

**ERC-2016-PoC\_737559\_INFIS:** “Targeting infertility associated to defective Insulin/IGF-1 signalling” Funding institution: European Research Council H2020. PI: Marta Artal-Sanz\_University Pablo de Olavide (01/05/2017-31/10/2018). Total amount: 150.000€.

**FP7-PEOPLE-2013-IEF-627263:** “Circadian timing of metabolism in *C.elegans*\_TiMetab”. Funding institution: European Union, 7<sup>th</sup> Framework Program. PI: Marta Artal-Sanz\_University Pablo de Olavide (01/07/2014–30/06/2016). Total amount: 223.002€.

**ERC-2011-StG-20101109-281691:** “Mitochondrial signalling crosstalk in the regulation of ageing\_MitoSigAge”. Funding institution: European Research Council, Ideas-7<sup>th</sup>Framework Program. PI: Marta Artal-Sanz\_University Pablo de Olavide (01/06/2012–31/05/2018). Total amount: 1.424.640€.

**CEIC-C2A-ID: 42571/Exp: 70806:** Mitochondrial stress signalling in the regulation of ageing. Funding institution: Junta de Andalucía. Programa de captación del conocimiento. PI: Marta Artal-Sanz\_University Pablo de Olavide (01/06/2012–31/05/2017). Total amount: 541.150€.

**BFU2012-35509:** “Mitochondrial Stress Signalling in the regulation of ageing”. Funding institution: Ministerio de Economía y Competitividad. PI: Marta Artal-Sanz\_University Pablo de Olavide (01/01/2013–31/12/2015). Total amount: 163.800€.

**BIOS:** “Studies for the analysis of biological signalling processes in *C. elegans*”. Funding institution: BIOS-Cluster of excellence University of Freiburg. PI: Marta Artal-Sanz\_University of Freiburg (15/02/2011–29/02/2012). Total amount: 33.870€.