MINISTERIO DE CIENCIA E INNOVACIÓN

CURRICULUM VITAE (maximum 4 pages)

AGENCIA ESTATAL DE INVESTIGACIÓN

CV date	January 2021

Part A. PERSONAL INFORMATION

First and Family name	Mónica Pradillo Orellana	
Researcher codes	Open Researcher and Contributor ID (ORCID**)	0000-0001-6625-6015
	SCOPUS Author ID (*)	16302024000
	WoS Researcher ID (*)	G-2432-2017

(*) Optional
(**) Mandatory

A.1. Current position

Name of University/Institution	Universidad Complutense de Madrid			
Department	Department of Genetics, Physiology, and Microbiology			
Address and Country	José Antonio Nováis, 12; 28040 Madrid (Spain)			
Phone number	0034913944764	E-mail	pradillo@bio.ucm.es	
Current position	Associate Professor (“*Contratado Dr.*”)		From	19th Feb 2019
Key words	Meiosis, chromosomes, cytogenetics, *Arabidopsis thaliana*, Homologous Recombination, DNA Repair			

A.2. Education

PhD, Licensed, Graduate	University	Year
PhD at Genetics Department	Universidad Complutense	2009
Degree in Biology	Universidad Complutense	2003

A.3. General indicators of quality of scientific production *(see instructions)*

Periods of research activity (“*sexenios*”): 2 (end of the last six-year period: Dec 2018).
Thesis supervised:
-“Control of meiotic recombination during the diploidization of autopolyploids in Arabidopsis” Pablo Parra Núñez (20/01/2021). PhD thesis with summa cum laude.
-“Control genético de la recombinación homóloga en la meiosis de *Arabidopsis thaliana*”. Javier Varas García (16/06/2014). PhD thesis with summa cum laude (co-supervision).
-“RNA de pequeño tamaño en la meiosis de *Arabidopsis thaliana*”. Cecilia Oliver Velasco (11/07/2013). PhD thesis with summa cum laude (co-supervision).
Total number of citations (Web of Science): 588 in 452 manuscripts (543 without self-citations).
Average number of citations/year over the last 5 years (Web of Science): 71,8
Total publications 1st quartile (Q1): 22 (14 in D1).
h index (Web of Science): 14. First author: 7 articles; last author: 9, corresponding author: 12.

Part B. CV SUMMARY *(max. 3500 characters, including spaces)*

I graduated in Biology with a major in Genetics at the UCM (2003). In 2004, I received the Extraordinary Bachelor's Award. After my doctoral studies (FPU grant), I was an Assistant Professor (2007). I defended my doctoral thesis in 2009, supervised by the leading expert on meiosis Prof. Juan L. Santos. Currently, I am an Associate Professor/Lecturer (since 2019). During these years, I have taught more than 1,600 h and I have also supervised 3 PhD students and 8 Master degree final Projects. I have combined my teaching activities with two three-month stays, one of them in the Imperial College (London), for which I obtained an EMBO grant (2012).

My research career has been mainly focused on the study of homologous recombination in meiosis using the model species *Arabidopsis thaliana*. During my PhD, I analyzed chromosome behavior in mutants defective for the recombinase RAD51, describing a specific role for this protein in Arabidopsis meiosis. During my postdoc, I characterized the meiotic function of genes involved in the biogenesis of small RNAs, and discovered the existence of a homeostatic control of crossovers (for the first time in plants), as well as the function of the nuclear envelope-associated SUN proteins in the dynamics of meiotic plant chromosomes. The study of the nuclear envelope has brought me into contact with a plant chromatin network, currently funded by a COST project. My research now focuses on determining the relation between the chromosomes and the nuclear envelope in the context of meiotic recombination.

Currently, I am supervising two PhD students. My activity in conferences has been very high in recent years, with more than 50% of communications in international meetings (oral

presentations and posters). I have been invited speaker in the most prestigious conference for meiosis research (Gordon), and in seminars in European and American Universities and research institutes. These invitations have been made because of my research about the influence of the nuclear envelope on meiosis, especially in relation to the nuclear pore complexes. This is a novel topic, for which there is no information in plant meiotic research.

I have participated in five national and in two European research projects. I am currently a PI of a European project (ITN network) and I am participating as the head of a working group of the COST action I mentioned before. My participation in European projects and networks has allowed me to establish collaborations, among which it is important to mention the publication in *Science* related to the discovery of the antirecombinase FANCM. Mutations in the corresponding gene produce an increase in recombination, which is potentially very interesting in terms of plant breeding.

My career in the field of plant meiosis is internationally valued, especially because there are very few groups that are experts in cytogenetics. I am an occasional reviewer of international research projects and articles published in prestigious journals. In addition, I am a member of the Editorial Committee of *Front Plant Sci* (Q1, D1), since January 2016. I have also participated in the edition of a special issue of *J Exp Bot* (Q1, D1) and a protocol book (27 chapters; Methods Mol Biol, published by Springer). In addition, I am a member of the Cell Biology committee of the Society for Experimental Biology (UK) since 2020.

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

C.1. Publications *(see instructions)* *****Corresponding author.

1. Fernández-Jiménez N, **Pradillo M*** (2020) The role of the nuclear envelope in the regulation of chromatin dynamics during cell division. *J Exp Bot* 71:5148-5159. doi: 10.1093/jxb/eraa299. (Q1 and D1).
2. Martinez-Garcia M, Fernández-Jiménez N, Santos JL, **Pradillo M*** (2020) Duplication and divergence: New insights into AXR1 and AXL functions in DNA repair and meiosis. *Sci Rep* 10:8860. doi: 10.1038/s41598-020-65734-2. (Q1).
3. Wijnker E, Harashima H, Müller K, …, Schnittger A* (2019) (**Pradillo M** 9/10) The Cdk1/Cdk2 homolog CDKA;1 controls the recombination landscape in Arabidopsis. *Proc Natl Acad Sci USA* 116: 12534-12539. doi: 10.1073/pnas.1820753116. (Q1).
4. Parra-Núñez P, **Pradillo M***, Santos JL (2019) Competition for chiasma formation between identical and homologous (but not identical) chromosomes in synthetic autotetraploids of *Arabidopsis thaliana*. *Front Plant Sci* 9:1924. doi: 10.3389/fpls.2018.01924. (Q1 and D1)
5. Varas J, Santos JL, **Pradillo M*** (2017) The absence of the Arabidopsis chaperone complex CAF-1 produces mitotic chromosome abnormalities and changes in the expression profiles of genes involved in DNA repair. *Front Plant Sci* 8:525. doi: 10.3389/fpls.2017.00525. (Q1)
6. Oliver C, Santos JL, **Pradillo M*** (2016) Accurate chromosome segregation at first meiotic division requires AGO4, a protein involved in RNA-dependent DNA methylation in *Arabidopsis thaliana*. *Genetics* 204:543-553. Highlighted article. doi: 10.1534/genetics.116.189217. (Q1).
7. Varas J, Sánchez-Morán E, Copenhaver GP, Santos JL, **Pradillo M*** (2015) Analysis of the relationships between double-strand breaks, synaptonemal complex and crossovers using the *Atfas1-4* mutant. *PLoS Genet* 11:e1005301. Cover of the journal in the month of July. doi: 10.1371/journal.pgen.1005301. (Q1).
8. **Pradillo M***, Knoll A, Oliver C, Varas J, Corredor E, Puchta H, Santos JL (2015) Involvement of the cohesin cofactor PDS5 (SPO76) during meiosis and DNA repair in *Arabidopsis thaliana*. *Front Plant Sci* 6:1034. doi: 10.3389/fpls.2015.01034. (Q1 and D1).
9. Crismani W, Girard C, Froger N, …, Mercier R* (2012) (**Pradillo M** 4/9) FANCM limits meiotic crossover. *Science* 336:1588-1590. doi: 10.3389/fpls.2018.00368. (Q1 and D1).
10. **Pradillo M***, López E, Linacero R, Romero C, Cuñado N, Sánchez-Morán E, Santos JL (2012) Together yes, but not coupled: new insights into the roles of RAD51 and DMC1 in plant meiotic recombination. *Plant J* 69: 921-933. Featured article mentioned on the cover. doi: 10.1111/j.1365-313X.2011.04845.x. (Q1 and D1)

C.2. Research projects

International research projects

1. Meiotic Control of Recombination in Crops [MEICOM, Marie Curie Initial Training Networks (ITN), Multi-Partner ITN; Call: H2020-MSCA-ITN-2017; Grant agreement number: 765212]. Coordinator: Eugenio Sánchez-Morán (University of Birmingham, UK). Funding source: European Union (H2020). Amount: 247,872.96 € (UCM). Period: Jan 2018-Dec 2021. I am the **PI** of this Project and leader of dissemination and outreach activities. I also belong to the Recruitment and Equal Opportunities Committee.
2. Impact of nuclear domains on gene expression and plant traits (COST Action CA16212). Coordinator: Christophe Tatout (University of Clermont-Ferrand, France). Funding source: European Union (H2020). Period: Nov 2017-Nov 2021. My position: **Management Committee Member** – Spain; Lead group of WG3.
3. Control of Meiotic Recombination: Arabidopsis to Crops [COMREC, Marie Curie Initial Training Networks (ITN), Multi-Partner ITN; Call: FP7-PEOPLE-2013-ITN; Grant agreement number: 606956]. Coordinator: Prof. Chris Franklin (University of Birmingham, UK). Funding source: European Union (FP7). Amount: 228,881.62 € (UCM). Period: Nov 2013-Nov 2017. **Scientist in Charge together with Juan Luis Santos Coloma** (UCM).
4. Systematic analysis of factors controlling meiotic recombination in higher plants (MEIOsys)" (Ref. KBBE-2009-222883). Coordinator: Prof. Chris Franklin (University of Birmingham, UK). Spanish PI: Juan Luis Santos (UCM). Funding source: European Union (FP7). Amount: 325,890 € (UCM). Period: Sept 2009-Aug 2014. **Member of the research team**.

National research projects (member of the research team)

5. Meiosis in polyploid plants: Analysis of recombination in allopoliploids (wheat) and autopolyploids (Arabidopsis) (AGL2015-67349-P). PI: Juan Luis Santos and Tomás Naranjo (UCM). Funding source: Ministry of Economy and Competitiveness. Amount: 80,000 €. Period: Jan 2016-Dec 2019.
6. Study of epigenetic changes occurring during spermatogenesis in *Caenorhabditis elegans* (2015/EEUU/13). PI: Jesús Page (UAM). University cooperation projects with the United States (collaboration with Dr. Monica Colaiácovo laboratory in Harvard Medical School, USA). Funding source: Universidad Autónoma de Madrid-Santander. Amount: 11.500,00 €. Period: Jul 2015-Dec 2016.
7. Analysis of meiosis in plants using gene and chromosomal mutations (AGL2012-38852). PI: Juan Luis Santos (UCM). Funding source: Ministry of Economy and Competitiveness. Amount: 80,000 €. Period: Jan 2013-Dec 2015.
8. *Arabidopsis thaliana*, a model organism for the study of recombination in plants (BFU2008-00459/BMC). PI: Juan Luis Santos (UCM). Funding source: Ministry of Science and Innovation. Amount: 120,000 €. Period: Jan 2009-Dec 2011.

Others

9. Chromosomal dynamics of the cell division (UCM 910452). Group evaluated by the state research agency (*AEI*) and qualified as good (categories: excellent, good, acceptable and questionable). Funding source: Universidad Complutense de Madrid. Amount: 2,200 €/year. I am the **PI** of this group since March 2019.

C.3. Patents

The results corresponding to the Science paper: "FANCM limits meiotic crossovers" (2012, see above), are protected by the application FR1158262 of the *Institut National de la Recherche Agronomique* and have led to the development of the patent WO2013038376 ("Increase in meiotic recombination in plants by inhibiting the FANCM protein"), published in Australia (03/20/2014) and in the United States (04/23/2014). They are also pending publication in the European Patent Office and in Israel.

C.4 Reviewer contribution

Nat Commun, PNAS, *Plant Cell*, *Plant J*, *PLoS Genet, New Phytol, Cell Mol Life Sci, Sci Rep, J Exp Bot, J Cell Sci...*External reviewer to evaluate research project proposals funded by University of Leuven (Belgium), Research Foundation Flanders, Netherlands Organisation for Scientific Research, *Deutsche Forschungsgemeinschaft* (Germany), Czech Science Foundation, *Danmarks Frie Forskningsfond* (Research Fund Denmark), *Agence Nationale de la Recherche* (France).

C.5 Editor

Book: Plant Meiosis: Methods and Protocols (2020). **Pradillo M**, Heckmann S (editors). 27 chapters. Springer (Germany). ISBN: 978-1-4939-9817-3 (Print) 978-1-4939-9818-0 (eBook). doi: 10.1007/978-1-4939-9818-0
Associate guest editor in *J Exp Bot* for the special issue Impact of Chromatin Domains on Plant Phenotypes (2020). Special issue editorial: doi:10.1093/jxb/eraa334.
Associate editor in *Front Plant Sci*, since January 2016. Editor of two research topics: Advances in plant meiosis from model species to crops (2019, 22 articles); Meiotic recombination and DNA repair: new approaches to solve old questions in model and non-model plant species (ongoing).

C.6 External thesis Committee

Universidad Complutense de Madrid; Universidad Miguel Hernández de Elche; Universidad Autónoma de Barcelona; Severo Ochoa Molecular Biology Center; Institute of Functional Biology and Genomics (Salamanca); University of Vienna (Austria), University of Halle-Wittenberg (Germany), National Biotechnology Center (CNB, Madrid).

C.7 Organization of scientific meetings

1. Main organizer of the SEB Antwerp 2021 session related to cellular function and nuclear dynamics in plant reproduction (Jul 2021, scheduled).
2. Local organizer of the SEB-COST_INDEPTH Symposium: Impact of Chromatin Domains on Plant Phenotypes. This meeting will be held in El Escorial (Dec 2019).
3. Main organizer of the 2nd MeioNet meeting. Spanish meiosis meeting (Jun 2017). This meeting bring together scientists to discuss the latest findings in the meiotic field and the implications for human fertility with a multidisciplinary scope. https://meionet.org/
4. MEIOsys Technical Workshop. Project MEIOsys (KBBE-2009-222883) (Feb 2012).

C.8 Invited speaker in seminars and international conferences

International conferences

1. SEB-COST_INDEPTH Symposium: Impact of Chromatin Domains on Plant Phenotypes (El Escorial, Madrid; Dec 2019).
2. Gordon Conference on Meiosis (New London NH; USA; Jun 2018).
3. EMBO Workshop on plant genome stability & change (IPK, Gatersleben, Germany; Jun 2018).

Seminars

1. Instituto de Biotecnología (Cuernavaca, Mexico; Oct 2020) (online seminar).
2. University of Hamburg (Germany; May 2019).
3. University of Clermont Ferrand (France; Oct 2019).
4. Gregor Mendel Institute (University of Vienna; Feb 2018).
5. Molecular Biology Center Severo Ochoa (Madrid; Sept 2017).
6. Estación Experimental Agrícola Fabio Baudrit (Universidad de Costa Rica; Mar 2017).

C.9 Research stays (of at least three months)

1. MRC Clinical Sciences Centre (Imperial College, London, UK). Dr. Enrique Martínez-Pérez lab. May-Aug 2012. EMBO grant (ASTF 294 – 2012).
2. Universidad Autónoma de Madrid. Prof. Julio Sánchez-Rufas lab. Jun-Sept 2008.

C.10 Awards

1. Distinguished young investigator, awarded by the Spanish Society of Genetics, for the relevance of the scientific contributions during 2014-2015 (Sept 2015) (open competition).
2. Extraordinary Bachelor's Award (2004). Highest-ranking student in Biology UCM-Jun 2003.

C.11 Institutional responsibilities

Coordinator of the Master Genetics and Cell Biology (60 ECTS) since Sept 2019. Three Universities participate in this Master (Universidad Autónoma de Madrid, Universidad de Alcalá de Henares and Universidad Complutense).