Part A. Personal Information

DATE	July 2023

Surname(s)	Rey Navarro	
Forename	Luis	
Social Security, ID number		
Researcher codes	WoS Researcher ID *(*)*	A-3389-2014
	SCOPUS Author ID*(*)*	ID:7005153934
	Open Researcher and Contributor ID (ORCID)	0000-0003-3477-6942

(*) At least one of these is mandatory

A.1. Current position

Post/ Professional Category	Associate professor	
UNESCO Code	2414, 2415, 2419	
Key Words	Rhizobium-legume Symbiosis, bacterial type VI secretion system,	
Name of the University/Institution	Universidad Politécnica de Madrid	
	Department/Centre	Dept. Biotechnology and Plant Biology/Centre for Plant Biotechnology and Genomics (CBGP)
	Full Address	Campus de Montegancedo. Autovía M40, km38. 28223 Pozuelo de Alarcón, Madrid
	Email Address	**luis.rey@upm.es**
	Phone Number	34 91 0679158
Start date	April 2003	

A.2. Education *(title, institution, date)*

Year	*University*	*Degree*	*Title*
1988	*Complutense de Madrid*	*First degree*	*Graduated (Licenciado) Biology*
1994	*Politécnica de Madrid*	*PhD*	*PhD*

A.3. Indicators of Quality in Scientific Production *(See the instructions)*

a) Total number of citations (Google Scholar): 1200, Since 2018 , 532
b) Total number of publications in SCI **34**, **27 Q1** (in the first quartile) of which **14 are D1** (in the first decile), 3 publications not in the SCI. 11 book chapters.
Last five years 15 publications , **11 Q1**
c) **h-index, 21 (G. Scholar),** 4 six-years research periods (sexenios de investigación), last 12/31/2020
d) PhD Thesis supervised 4, last defended in 2023 and one in progress to be defended in 2025).
e) Graduation Thesis supervised 18, Master Thesis supervised 5, Cotutor of 11 graduation Thesis.

Part B. Free Summary of CV *(Max. of 3.500 characters, including spaces)*

I obtained a PhD degree in Biology (1994) from the Polytechnic University of Madrid. I work in the Group "Association of symbiotic bacteria with plants" of the Centre for Plant Biotechnology and Genomics (UPM-INIA/CSIC) led by Professor José M Palacios since 2001. My research has been focused mainly on the *Rhizobium*-legume interaction. In my predoctoral stage I studied hydrogenase accessory proteins of *Rhizobium leguminosarum* supervised by Professor Tomás Ruiz Argüeso. Then I made a postdoctoral stay (one year, 1996) at the Johns Hopkins University (Baltimore, USA), on the characterization of c-type cytochromes of *Azotobacter vinelandii* in the group of Dr Robert J Maier. Back to the UPM I studied the Tat protein transport system required for the *Rhizobium* symbiosis. In this topic I co-directed my first PhD thesis (2002). Also, I characterized the Tat system of the pathogen

Dickeya dadantii, in collaboration with Professor Pablo Rodríguez Palenzuela. I am interested in the diversity of rhizobia that nodulate lupins, in this line I co-directed my second Thesis. In 2010 I started several still active collaborations with Dr. F. Boulila (Bejaia University, Algeria) and with Dr M. Rejili (Gabès University, Tunisia) **about biodiversity of rhizobia** from North African legumes. I also share research with Dr Esperanza Martínez-Romero of the Centre of Genomics Sciences (Cuernavaca, Mexico) and with Dr Ernesto Ormeño-Orrillo (La Molina University, Lima, Peru). These rhizobia showed several protein secretion systems as the type III and type VI and I began their study in collaboration with Dr. Michael Göttfert of the University of Dresden, Germany. In the last years I have been leading the research on these systems, in particular about the type VI, whose role is practically unknown in rhizobia and our results indicate that it plays an important role for the rhizobia in the rhizosphere and in the symbiosis with legumes. This work has favored the co-direction of a PhD Thesis with Dr Boulila defended in February 2022 by Lilia Tighilt and the direction of the PhD student BFS De Sousa, who was awarded a scholarship from the Brazilian government whose thesis defense is scheduled for April 2023. I am also co-director of a FPI scholarship holder, Lucía Domingo Serrano in the period 2020-2025. In 2019 I obtained a grant of the Ministry of Science and Innovation in the Mobility Stay Programme Salvador de Madariaga to collaborate in 2020-2021 with Dr Joseph Mougous (Washington University, Seattle, USA), an expert and pioneer in the study of T6SS, for three months. Unfortunately, this stay could not take place due to the Covid. Recently I have been in contact with Drs. Alberto Macho (Molecular Plant-Bacteria Interactions, Shanghai Center for Plant Stress Biology, China) and Ruben Garrido-Oter (Integrative Bioinformatics, Max Planck Institute for Plant Breeding, Cologne, Germany) to establish collaboration and stays of our PhD students.

Part C. Relevant accomplishments

C.1. Up to 10 Publications last 5 years (2017-2023)

Scopus Subject categories EEBS: Ecology, Evolution, Behavior and Systematics; AMP Applied Microbiology and Biotechnology; ABS: Agricultural and Biological Sciences

1. De Sousa, B. F. S., Domingo-Serrano, L., Salinero-Lanzarote, A., Palacios, J. M., & **Rey, L**. (2023). The T6SS-Dependent Effector Re78 of Rhizobium etli Mim1 Benefits Bacterial Competition. Biology, 12(5), 678. (Q1)

2. Tighilt, L., Boulila, F., De Sousa, B.F.S., Giraud, E., Ruiz-Argüeso, T., Palacios, J.M., Imperial, J. and **Rey, L.,** The *Bradyrhizobium* sp. LmicA16 Type VI Secretion System is Required for Efficient Nodulation of Lupinus Spp. 2021. Microbial Ecology (DOI 10.1007/s00248-021-01892-8) (Q1)

3. Msaddak, A.; **Rey, L**.;Imperial, J.; Palacios, J.M.; Mars, M.;Pueyo, J.J. Phylogenetic Analyses of Rhizobia Isolated from Nodules of Lupinus angustifolius in NorthernTunisia Reveal Devosia sp. as a New Microsymbiont of Lupin Species. Agronomy 2021,11, 1510. https://doi.org/10.3390/agronomy11081510 (Q1)

4. De Sousa BF, Castellane TC, Tighilt L, Lemos EG, **Rey L**,. Rhizobial exopolysaccharides and type VI secretion systems: a promising way to improve nitrogen acquisition by legumes. Frontiers in Agronomy. 2021;3:47. doi.org/10.3389/fagro.2021.661468

5. Msaddak A, Rejili M, Durán D, Mars M, Palacios JM, Ruiz-Argüeso T, **Rey** L, Imperial J,. *Microvirga tunisiensis* sp. nov., a root nodule symbiotic bacterium isolated from *Lupinus micranthus* and *L. luteus* grown in Northern Tunisia. Syst Appl Microbiol. 2019 Sep 23:126015. doi.org/10.1016/j.syapm.2019.126015 (**Q1,** 82 /612, EEBS)

6. Salinero-Lanzarote A, Pacheco-Moreno A, Domingo-Serrano L, Durán D, Ormeño-Orrillo E, Martínez-Romero E. Albareda M, Palacios JM, **Rey L** 2019. The type VI secretion system of Rhizobium etli Mim1 has a positive effect in symbiosis. FEMS Microbiol Ecol. doi: 10.1093/femsec/fiz054. (**D1**, 34/352 Ecology)

7. Durán D, Imperial J, Palacios J, Ruiz-Argüeso T, Göttfert M, Zehner S, **Rey L** Characterization of a novel MIIA domain-containing protein (MdcE) in *Bradyrhizobium* spp. FEMS Microbiol lett 2018, 365, 5, doi.org/10.1093/femsle/fnx276. (**Q3,** 77/146, Microbiology).

8. Msaddak A, Rejili M, Durán D, **Rey** L, Imperial J, Palacios JM, Ruiz-Argüeso T, Mars M. Definition of two new symbiovars, sv. lupini and sv. mediterranense, within the genera *Bradyrhizobium* and *Phyllobacterium* efficiently nodulating *Lupinus micranthus* in Tunisia. Syst Appl Microbiol. 2018. doi.org/10.1016/j.syapm.2018.04.0 (**Q1,** 82 /612, EEBS)

9. Ahnia H, Bourebaba Y, Durán D, Boulila F, Palacios JM, **Rey** L, Ruiz-Argüeso T, Boulila A. and Imperial J. 2018. *Bradyrhizobium algeriense* sp. nov., a novel species isolated from

effective nodules of *Retama sphaerocarpa* from Northeastern Algeria. Syst Appl Microbiol 41:333-339, doi.org/10.1016/j.syapm.2018.03.004. (**Q1,** 82 /612, EEBS)
10. Sánchez-Cañizares C, Jorrín B, Durán D, Nadendla S, Albareda M, Rubio-Sanz L, Lanza M, González-Guerrero M, Prieto RI, Brito B, Giglio MG, **Rey** L, Ruiz-Argüeso T, Palacios JM, Imperial J. Genomic diversity in the endosymbiotic bacterium *Rhizobium leguminosarum*. Genes 2018, 9, 60; doi:10.3390/genes9020060. (**Q1,** 68 /340, Genetics)

C.2. Research Projects and Grants

1. CBGP-CEPLAS International Collaborative Scientific Program. EoI-CSPINT06-SynComSymbio. Duration 2023-25. Amount 30.000 €. IP: Rubén Garrido-Oter and **Luis Rey**
2. RED2022-134667-T. Biotecnología de las interacciones beneficiosas ente plantas y Microorganismos. Duration 2023-24. Amount 18.000 €. IP: Paula Fraile, **Luis Rey** y 13 invest.
3. Nuevos mecanismos de adaptación de los rizobios a la simbiosis (RhizoAdS) Funding MCI PID2021-124344OB-100 2022-2025. Duration 2022-2025. Amount 205.700,00 €. IP: José M Palacios and **Luis Rey**
4. Mechanisms for the adaptation of rhizobia to symbiosis with leguminous plants (RhizoAdapt)". Funding MICINN. RTI2018-094985-B-I00. Duration 2019-2021. Amount: 151,250 €. PI: José M Palacios Alberti.
5. Relevance of the type VI secretion system of rhizobia associated to pallar and bean. Funding: UPM-Activities with Latin America (Peru) AL16-PID-6. Period: February-November 2016. Amount: 5,100 €. P.I.: **Luis Rey**
6.- "Plant-bacterial signaling in the late stages of Rhizobium-legume interaction (SYMBIOSIGNAL)". Funding: MCINN BIO2013-43040
Duration 2014-2017. Amount: 151,250 €. PI: José M Palacios Alberti
7.-" Characterization of effectors dependent on type III secretion systems in Bradyrhizobium-legume symbiosis" Funding: Programa Acciones Conjuntas Hispano-Alemanas/DAAD-UNIVERSIDAD. Duration 1-2014- Dec 2015 Amount: 6.358 €. PI: **Luis Rey**
8.- Functional analysis of type III and type VI secretion systems of endosymbiont bacteria associated with pallar and bean. Funding AL15-PID37 UPM-Activities with Latin America (Peru and Mexico) Period January-December 2015. Amount: 1.650€ PI: **Luis Rey**
9.- Functional analysis of type VI secretion systems of bean symbiont rhizobia" Funding: UPM-Activities with Latin America (Mexico) AL14-PID-10. Duration January 2014 - December 2014. Amount: 2,500 €. PI **Luis Rey**

C.3. Contracts

Subcontracting Univ. Cartagena, Characterization works of endosymbiotic bacteria nodulating Astragalus nitidiflorus. Action C.2. LIFE CONSERVASTRAGALUS-MU project (LIFE11 BIO/ES/727) June 2016-January 2017 Amount 6000 €. PI **Luis Rey**

C.4. Patents and other IPR

C.5, C.6, C.7… Other

C.5 Participation in assessment tasks (last 5 years)
- Evaluator: Comisión Sectorial de Investigación Científica de la Universidad de la República, Uruguay (2012-); Agencia Nacional de Investigación e Innovación de Uruguay (2016-) and the ANEP española (2016-); DEVA, Agencia Andaluza de Evaluación y Acreditación, Universidad de las Fuerzas Armandas (Ecuador)
- Journal Reviewer: Plant Pathology (2012-), FEMS Microbiology Ecology (2016-), Microbial Ecology (2016-), World Journal of Microbiology and Biotechnology (2015-), MPMI (2019-), Frontiers in Microbiology (2019-), Microorganisms (2019-), Scientific Report (2021-)
- Membership of the Scientific committee of the the XV international Lupin Conference for 2019.

C.6 Experience in organizing R & D activities
- Coordinator of workshops in the Week of the Science 2010-present at the CBGP. Scope: National
- Coordinator of the Week of Biotechnology at the UPM 2014. Dissemination in the year of Biotechnology in Spain. Scope: National

- Coordinator of the Fascination of Plants Day at the CBGP 2012. Activity: Discussion forum
- Speaker in " JORNADA DE INVESTIGACIÓN CIENCIAS BIOMÉDICAS, BIOTECNOLOGÍA, FARMACIA Y MEDIO AMBIENTE, 10 de Mayo 2023, Universidad Europea de Madrid.

C. 7 Invited lecturer by international organizations (5 in the last 10 years)

1. The T6SS of Rhizobium etli Mim1 has a positive effect in symbiosis. I Spanish-Portuguese Congress on Benefitial Plant-Microbe Interactions y XVIII Reunión Nacional de Fijación de Nitrógeno de la SEFIN, Oeiras Portugal, October 17-20, 2022. S6-O-05.
2. The T6SS of *Rhizobium etli* Mim1 has a positive effect in symbiosis. VI Congreso Luso-Español de Fijación de Nitrógeno y XVII Reunión Nacional de Fijación de Nitrógeno de la SEFIN, Madrid, 10-12 June, 2019. SIV-O08.
3. Relevance of bacterial secretion systems Type III and Type VI in the *Bradyrhizobium-Lupinus* simbiosis. 14th International Lupin Conference. 21-26 June, 2015, Milan, Italy.
4. Characterization of Type III secretion systems in new *Bradyrhizobium* strains: The T3SS of *Bradyrhizobium* sp. LmjC plays an important role in host specificity. 11th European Nitrogen Fixation Conference, OC5-5 .Costa Adeje, Tenerife, Spain, 7-10 September 2014.
5. Caractérisation des rhizobiums nodulant *Lupinus* du Centre-Est d´Espagne et ceux de Retama de Nord d´Algérie. 2èJournées Sci de Nature et la Vie, Béjaia, Algeria, 7-8 nov 2012

C8. Scientific awards

- Extraordinary doctorate award, 1995
- Best Poster at I Congresso Luso-Espanhol de Fixaçao de Azoto e XII SEFIN, celebrated in Estoril, Portugal, 1-4 June 2008
- Best written work in Research at the IV Congreso de Estudiantes Universitarios de Ciencia, Tecnología e Ingeniería Agronómica. ETSI Agrónomos, UPM, Madrid, 11 May, 2011.
- In 2021 I received the Science and Society Award from the UPM.