

Part A. PERSONAL INFORMATION

CV date	14/07/2022
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First and Family name	Marta Robledo Garrido		
ID number	72140387J	Age	39
Researcher codes	SCOPUS Author ID	35911058400	
	ORCID	0000-0002-4049-7635	

A.1. Current position

Employing entity	Biomar Microbial Technologies		
Department	Department of Microbiology		
Working Address	IBBTEC. C/ Albert Einstein 22, 39011 Santander (Spain)		
Phone number	942206799 (Ext. 132)	E-mail	<a href="mailto:m.robledo@biomarmt.es">m.robledo@biomarmt.es</a> <a href="mailto:marta.robledo@unican.es">marta.robledo@unican.es</a>
Current position	Torres Quevedo Postdoctoral researcher	From	11/2018
Key words	Genetics, Microbiology, beneficial plant-microbe interactions, RNA-regulation, Transcriptomics, nitrogen fixation , cell-cycle, biofertilizers, phytopathology.		

A.2. Education

PhD	University	Year
Doctor Europeus in Microbiology and Genetics	Universidad de Salamanca	2010

A.3. JCR articles, h Index, thesis supervised...

- Total citations: 599.
- **JCR publications: 32**; 26 articles: 10 **D1**; 22 Q1; mean impact factor 5 (aprox). 6 book chapters.
- **H-index: 13**. 15 JCR indexed publications as first author and 4 as last/corresponding author.
- First authorship of high-impact factor journals: **PNAS, Nucl Acid Res, Plos Gen, Env Microbiol...**
- Supervision of **2 PhD thesis (1 ongoing PhD)**, 3 Master, 3 BSc students, 4 PhD Research Stays and 3 BSc student laboratory internships.
- Accreditations: "Profesor Contratado Doctor" (ANECA); "Investigador Distinguido-I3" (AEI).

**Part B. CV SUMMARY**

I started my scientific career in the research group at University of Salamanca awarded by a FPU fellowship (2006-2010). During my Ph.D. I conducted several short research stays at UCLA (USA) and JIC (Norwich, UK). After completing my Doctorate I was awarded with a Humboldt project to fulfil my first postdoctoral stay at Marburg University (Germany) hosted by Prof. Dr. Anke Becker, head of Centre for Synthetic Microbiology (2011-2015). After a "Juan de la Cierva" contract (2015-2017) at Estación Experimental del Zaidín (CSIC, Granada), I joined the group "Intergenomics" led by Prof. Dr. Fernando de la Cruz at Institute of Biomedicine and Biotechnology of Cantabria (IBBTEC). Since 2018 I am also leading innovation projects thanks to funding from the "Torres Quevedo" program aid with the biotech company Biomar Microbial Technologies.

My research aims at a systems-based understanding of how the versatile adaptive strategies that regulate the ability of microorganism to colonize and infect eukaryotic hosts are regulated. During my Ph.D., I focused my work on the characterization of the mechanisms governing bacterial interaction with plants, discovering essential enzymes for rhizobial signaling, attachment and infection of host legumes. My postdoctoral research line aimed at an experimental validation and functional characterization of bacterial non-coding RNAs, unravelling environmentally-relevant post-transcriptional regulation of essential prokaryotic functions such as cell cycle progression and host intracellular establishment. Recently, my work on ncRNA-binding proteins has contributed to unveil novel enzymes involved in riboregulation. I also contributed to decipher the spatiotemporal replication-segregation patterns of microorganisms carrying multiple plasmids. My research interests at IBBTEC included targeted conjugation engineering in natural bacterial communities and protocells. Currently, I am leading innovation projects on dynamical and functional characterization of endophytic microbiomes and control mechanisms against the emergent phytopathogen *Xylella fastidiosa* in collaboration with the private company "Biomar MT". For that, I supervised a biosafety level 2 facility together with a PhD student and a technician. I am a recognized researcher in my field who developed autonomy and initiative to design experiments, write papers, patents and grants and find international collaborations. My research has been funded by competitive grants and I have experience in managing fundamental and applied projects, budgets, facilities, students and technicians.

### Part C. RELEVANT MERITS. C.1. Relevant publications

1. ROBLEDO M\*; García-Tomsig NI\*; Matia-González AM; García-Rodríguez FM; Jiménez-Zurdo JI 2020. "Synthetase of the methyl donor S-adenosylmethionine from N-fixing  $\alpha$ -rhizobia can bind functionally diverse RNA species" 2021. **RNA Biology**. IF: 5.35 (Q1). (5/1). \*Equal contribution
2. Menéndez E\*, ROBLEDO M\*, Jiménez-Zurdo JI, Velázquez E, Rivas R, Murray JD, Mateos PF. 2019. "Legumes display common and host-specific responses to the rhizobial cellulase CelC2 during primary symbiotic infection" 2019 **Scientific Reports**. IF: 3.99 (D1). 9(1):13907. (7/2);
3. ROBLEDO M<sup>#</sup>, Schlüter JP, Loehr LO, Linne U, Albaum S, Jiménez-Zurdo JI, Becker A. 2018. "*An sRNA and cold shock protein homolog-based feedforward loop post-transcriptionally controls cell cycle master regulator CtrA*" 2018 **Frontiers in Microbiology**. IF: 4.26 (Q1). 24, 9:763. (7/1; <sup>#</sup>Corresponding author).
4. ROBLEDO M, Menéndez E, Jiménez-Zurdo JI, Velázquez E; Martínez-Molina E, Oldroyd G, Mateos PF. 2018. "*Heterologous expression of rhizobial CelC2 cellulase impairs symbiotic signaling and nodulation in Medicago truncatula*". 2018. **Molecular Plant-Microbe Interactions**. IF: 4.33 (D1). 31(5):568-575. (7/1; total author number/ position of researcher).
5. ROBLEDO M, Peregrina A, Millán V, García-Tomsig NI, Torres-Quesada O; Becker A, Jiménez-Zurdo JI. 2017. "*A conserved  $\alpha$ -proteobacterial small RNA contributes to osmoadaptation and symbiotic efficiency of rhizobia on legume roots.*" **Environmental Microbiology**. IF: 5.93 (D1). 19(7):2661-80. (7/1).
6. Saramago M\*, Peregrina A\*, ROBLEDO M\*, Matos R; Hilker R; Serrania J; Becker A; Arraiano C; Jiménez-Zurdo JI. 2017 "*Sinorhizobium meliloti YbeY is an endoribonuclease with unprecedented catalytic features, acting as novel silencing enzyme in riboregulation*". **Nucleic Acids Research**. IF: 9.20 (D1). 45(3): 1371–1391. (9/3 \*Equal contribution).
7. Frage B; Döhlemann J; ROBLEDO M; Lucena D; Graumann PL; Becker A. 2016 "*Spatiotemporal choreography of chromosome and megaplasmids in the Sinorhizobium meliloti cell cycle*". **Molecular Microbiology** IF: 4.42 (D1). 100 (5), 808 - 823. (6/3).
8. ROBLEDO M, Frage B, Wright PR, Becker A. 2015 "*A stress-induced small RNA modulates alpha-rhizobial cell cycle progression*". **PLoS Genetics**. IF: 8.167 (D1). 11(4):e1005153. (4/1).
9. ROBLEDO M, et al. 2012 "*Role of Rhizobium endoglucanase CelC2 in cellulose biosynthesis and biofilm formation on plant roots and abiotic surfaces*". **Microbial Cell Factories**. IF: 3.55 (Q1).12:11-125. (8/1).
10. ROBLEDO M; Jiménez-Zurdo JI; Soto MJ; Velázquez E; Dazzo F; Martínez- Molina E; Mateos PF. 2011 "*Development of functional symbiotic white clover root nodules requires tightly regulated production of rhizobial cellulase CelC2*". **Molecular Plant Microbe Interactions** IF: 4.41 (D1). 24 (7), 798-807 (7/1).
11. ROBLEDO M, et al. 2008 "*Rhizobium Cellulase CelC2 Is Essential for Symbiotic Infection of Legume Host Roots*" **Proceedings of the National Academy of Sciences**. IF: 9.43 (D1). 105 (19):7064-9. (11/1).

### C.2. Participation in Research, Development and Innovation Projects

1. RES2020PU035 "Caracterización de compuestos activos contra el fitopatógeno emergente *X. fastidiosa* para su protección intelectual" Subvención para el fomento de la transferencia de conocimiento en materia de investigación en Cantabria. 2021. 20.000 €.
2. CEREALIA" Usos del microbioma del trigo en la protección frente al estrés hídrico." CDTI Proyectos de I+D de transferencia tecnológica "Cervera".2020-22. 633.412 €.
3. PTQ-17-09029 "Identificación de compuestos inhibidores de la formación de biofilm para combatir la virulencia de la bacteria fitopatógena *Xylella fastidiosa*." Agencia Estatal de Investigación-Programa **Torres Quevedo**. Robledo M (Biomar MT). 2018-21. 77.000 €.
4. EQC2019-000705-C "Plataforma tecnológica para el cribado de alto rendimiento en condiciones de contención biológica" AEI- Programa adquisición de infraestructuras y **equipamiento científico**. de la Cruz, F (IBBTEC, CSIC). 2019-20. 107.000 €.
5. 10/16/LE/0002 "Productos microbianos para el desarrollo de tratamientos fitosanitarios innovadores y sostenibles". Fondo Europeo de Desarrollo Regional (**FEDER**)-Agencia de Innovación, Financiación e Internacionalización Empresarial. Medarde A/de la Cruz F. (Biomar MT/Universidad de Cantabria). 2017-19. 651.540 €.

6. RTC-2015-3184-1 "Nuevas estrategias para el control de infecciones nosocomiales". Ministerio de Ciencia- Proyectos **Retos Colaboración**. Lasa I./de la Cruz, F. (Universidad de Cantabria). 2016-18. 472.374 €.
7. BFU2013-48282-C2-2-P "Non-coding RNA Regulation in Prokaryotes" Ministerio de Economía- **Plan Nacional**. IP: Jiménez Zurdo J.I. CSIC. 2015-17. 121.000 €. "Research team" member.
8. ProLOEWE-Synmikro "Regulation of cell cycle in *Sinorhizobium meliloti*" **LOEWE- Excellence Program** of Hesse. PI Becker A. (Marburg University & Max Planck Institut). 2010-08. *Researcher*.
9. 3.3-SPA/1141682STP "Identification, validation and functional characterization of small non-coding RNAs in N-fixing bacteria" Av**Humboldt** Foundation-Research Fellowship & Subsidy for research costs. PI Becker A./Robledo M. (Marburg University). 2011-4. 89.000 €. *Principal researcher*.
10. SPP1258-40014398 "Sensory and regulatory RNAs in Prokaryotes". **DFG- Priority Program**. Becker A/ Giegerich R. (Marburg University). 2007-13. *Researcher*.
11. AGL2008-03360 "*Rhizobium* as microbial delivery system in agriculture". Ministerio de Educación- **Plan Estatal**. Mateos PF (Universidad de Salamanca). 2009-11. 120.000 €. *Researcher*.
12. AGL2005-07796 "Análisis molecular y funcional de las celulasas producidas por *Rhizobium* en la simbiosis rhizobia/planta. Ministerio de Educación- Proyecto **Plan Estatal**. Mateos P.F. (Universidad de Salamanca). 2005-08. 115.000 €. *Researcher*.

### C.3. Participation in Research, Development and Innovation Contracts

- "Microbiología y Genómica de microorganismos de interés agrícola" Agreement with "Biomar MT" de la Cruz, F/Medarde A (Universidad de Cantabria). 2015-21.

### C.4. Direction of PhD, Master and BsC Thesis and other university teaching experience

1. "Plasmid metagenomics: applications in environmental synthetic biology" (2019- ). Sanz I. Universidad de Cantabria-funded **PhD thesis**.
2. "Regulación de la Simbiosis Fijadora de Nitrógeno *Rhizobium*-leguminosa por sRNAs Bacterianos" (2016-2022) García-Tomsig NI. Universidad de Granada. **FPU-funded PhD thesis**.
3. "Caracterización funcional de riboreguladores en el endosimbionte diazotrófico *S. meliloti*" 2016. García-Tomsig NI ("Matrícula de Honor") Universidad de Granada. *Master thesis*.
4. "Mecanismo de actividad del riboregulador AbcR2 en *S. meliloti*" 2017. Uceta AF (Calification "Matrícula de Honor"). Universidad de Granada. *Master thesis*.
5. "Optimization of endophytic wheat seeds community analysis" 2019. (9.3/10). Universidad de Cantabria/Universidad Complutense de Madrid. *Master Thesis*.
6. "Plasmid propagation among cells without chromosome" (2018). Cuesta-Martín R. Universidad de Cantabria/Universidad Complutense de Madrid. *BSc thesis*.
7. "Experimental validation and functional characterization of a small non-coding RNA". 2013. Klaner C. University of Marburg. *BSc thesis*.
8. Supervision of **4 PhD Research Stays** and 3 BSc student laboratory internships.
9. **Master's degree teaching:**
  - Cellular and Molecular Microbiology (2017- now) University of Cantabria.
  - Genetic and Evolution (2015-17) University of Granada.
  - Master in Agrobiotechnology. (2010-15) University of Salamanca.
10. **Bachelor's degree** (University of Salamanca; 20 ECTS credits)
  - UNESCO International course "Edafología, Fertilidad y Biología Vegetal" (2015-2017).
  - Microbiología Ambiental (2010-11) Facultad de Ciencias Ambientales.
  - Microbiología Industrial (2009-10) Facultad de Biología (Ldo. Bioquímica).
  - Ampliación de Microbiología. (2006-08). Facultad de Farmacia.

### C.5 Scientific awards and fellowships

- 2022 "**Antonio J. Palomares**" research award for my relevant contributions in the field of beneficial plant-microorganism interactions given by the Spanish Society for Nitrogen fixation.
- 2020 "**EIT Food Innovator Fellowship**" EU award for advanced training in entrepreneur skills.
- 2018-present "**Torres Quevedo**" contract with Biomar MT.
- 2015-17 "**Juan de la Cierva**" contract at Estación Experimental del Zaidín (CSIC, Spain).
- 2014-15 "**Synmikro Post Doc Program**" contract at Center for Synthetic Microbiology.
- 2011-13 "**Humboldt**" Foundation Postdoc Research fellowships (University of Marburg).
- 2007-2010 "Formación de Personal Universitario" (FPU) predoctoral grant.

- 2 Research stay- and 4 conference attendance grants supported by international funding: **FEMS, EMBO**, “German Academic Exchange Program” (**DAAD**),..
- Three **1st Prizes** in Scientific Poster & Photography Competition held during conferences.
- 2008 “**Best Research Degree Project Award**” University of Salamanca.

### **C.6 Book Chapters & reviews**

1. **ROBLEDO M**, García-Tomsig NI; Jiménez-Zurdo JI 2020. "*Riboregulation in Nitrogen-Fixing Endosymbiotic bacteria*" **Microorganisms**. 8 (3):384. IF: 4.17 (3/1).
2. **ROBLEDO M**; Matia-González AM; García-Tomsig NI; Jiménez-Zurdo JI. 2018 "*Identification of small RNA-protein partners in plant symbiotic bacteria*". In: Bacterial Regulatory RNA. **Methods in Molecular Biology**.1737, pp. 351-370. Humana Press, NY. ISBN 978-1-4939-7633-1. (4/1).
3. **ROBLEDO M**; García-Tomsig NI; Jiménez-Zurdo JI. 2018. "*Primary characterization of small RNAs in symbiotic nitrogen-fixing bacteria*". In: Host-Pathogen Interactions. **Methods in Molecular Biology**. 1734, pp. 277 - 295. **Humana Press**, New York, NY. ISBN 978-1-4939-7603-4. (3/1).
4. Jiménez-Zurdo JI & **ROBLEDO M**. 2017 “*RNA silencing in plant symbiotic bacteria: insights from a protein-centric view*”. **RNA Biology** 14:1-6. (2/2).
5. Menéndez E, et al. 2016.“*Rhizobium symbiotic enzyme cellulase CelC2: properties and applications*” In: New and Future Developments in Microbial Biotechnology and Bioengineering. 277-286 Ed **Elsevier**. ISBN 978-0-444-63507-5. (11/7).
6. **ROBLEDO M**<sup>#</sup>, Jiménez-Zurdo JI, Becker A 2015 “*Antisense transcription of symbiotic genes in Sinorhizobium meliloti*” 67 (1):55–67. **Symbiosis**. (3/1; <sup>#</sup>Corresponding author).
7. **ROBLEDO M**, et al. 2015. “*Role of Rhizobium cellulase CelC2 in host root colonization and infection*” In Biological Nitrogen Fixation II,167-194. FJ de Bruijn, **Wiley-Blackwell**, Indianapolis. ISBN 9781119053095. (9/1).
8. Jiménez-Zurdo JI & **ROBLEDO M**. 2015 “*Unravelling the universe of small RNA regulators in the legume symbiont Sinorhizobium meliloti*” **Symbiosis**. 67 (1):43-54. (2/2).
9. Becker A, et al. 2014 “*Riboregulation in plant-associated alpha-proteobacteria*”. **RNA Biology**. 11(5):550-62. (8/5).
10. Mateos PF, Rivas R, **ROBLEDO M**, Velázquez E; Martínez-Molina E; Emerich DW. 2011. “*The path of Rhizobia: from a free-living soil bacterium to root nodulation*”. In Environmental Aspects of N Metabolism in Plants. 167 - 194. Ed. **Wiley-Blackwell**, Indianapolis. ISBN 9780813816494. (6/3).

### **C.7 Participation in conferences and seminars**

- **58 works** presented in 29 inter- and 23 national conferences: International Meetings on Plant-microorganisms interactions, Regulating with RNA, Nitrogen Fixation...
- 16 contributions as **invited speaker** or selected oral communications.
- 12 seminars given after invitation in renowned international and national research centres.

### **C.8 Research visits to international renowned centers**

- 2018: Institut national de la recherche agronomique, Angers, France. Host: Prof. Dr MA Jacques.
- 2015: University of Giessen, Germany. Host: Prof. Dr. Elena Evguenieva-Hackenberg.
- 2014: Universidad Nacional de La Plata, Argentina. Host: Prof. Dr. Antonio Lagares.
- 2009-10: John Innes Centre (Norwich, United Kingdom). Host: Prof. Dr. Giles Oldroyd.
- 2008: University of California Los Angeles (USA). Host: Prof. Dr. Ann M. Hirsch.

### **C.9 Participation in assessment or advisory tasks, international committees and editorial boards**

- Member of several international Doctoral and master thesis evaluation committee.
- Habitual article reviewer in scientific journals (Scientific Reports, Mol Microbiol, RNA...)
- National Projects assessment committee (Conicet, Argentina)

### **C.11. Management of scientific activity**

- President, secretary and National agent contact of researchers associations (“INNOVA”, “FJI”).
- Member of the organizing committee of 3 research conferences.
- Reviewer editor of Frontiers in plant science and Plos Genetics
- Organization of seminars for research career development and scientific outreach.
- Direction of the work and training of laboratory technicians, graduate and visiting students.
- Scientific coordinator of applied research projects including grant applications, purchase of equipment, elaboration of reports, project design and articles writing.