**CURRICULUM VITAE (CVA)**

***IMPORTANT – The Curriculum Vitae cannot exceed 4 pages. Instructions to fill this document are available in the website.***

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| **CV date** | 25/01/2023 |

**Part A. PERSONAL INFORMATION**

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| --- | --- |
| First name  | MARÍA ROSA |
| Family name | BARRIO OLANO |  |  |
| Gender (\*) | Female |  |  |
| e-mail | rbarrio@cicbiogune.es | URL Web: http://personal.cicbiogune.es/rbarrio/https://www.cicbiogune.es/people/rbarrio |
| Open Researcher and Contributor ID (ORCID) | 0000-0002-9663-0669 |

**A.1. Current position**

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| --- | --- |
| Position | Principal Investigator  |
| Initial date | 01/12/2004  |
| Institution | Asociación Centro de Investigación Cooperativa CIC bioGUNE  |
| Department/Center |  Functional Genomics  |  |
| Country | Spain  | Teleph. number | +34 944061316 |
| Key words | SUMO, Ubiquitin, SALL, Rare disease, ciliopathy, Drosophila, Development, proteomics, Townes-Brocks Syndrome  |

**A.2. Previous positions (research activity interuptions, art. 14.2.b))**

|  |  |
| --- | --- |
| Period | Position/Institution/Country/Interruption cause |
| 2003-2008 | Ramón y Cajal Fellow/CBMSO, UAM-CSIC; CIC bioGUNE /Spain |
| 2001-2004 | Postdoctoral Fellow/CBMSO, UAM-CSIC/Spain |
| 1995-2000 | Postdoctoral Fellow/EMBL/Heidelberg, Germany |
| 1993-1995 | Marie Sklodowska Curie Postdoctoral Fellow/IMBB/Heraklion, Greece |
| 1993 | Postdoctoral Fellow/The Biolabs/Cambridge, USA |
| 1988-1993 | Gobierno Vasco Graduate Student/CBMSO, UAM-CSIC/Spain |

**A.3. Education**

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| --- | --- | --- |
| PhD, Licensed, Graduate | University/Country | Year |
| PhD in Sciences | Autónoma de Madrid UAM, Spain | 1993 |
| Bachelor in Biology | Autónoma de Madrid UAM, Spain | 1988 |

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

**Scientific Contributions:** Protein homeostasis (proteostasis) plays a determinant role in cell growth and development. Defects in proteostasis are involved in various rare diseases. The members of the **ubiquitin family** (UbL) are key players in proteostasis regulation.

My interest on the UbLs started during my PhD (1988-1993 CBMSO, Madrid), where I characterized the ubiquitin genes and their regulation in *Drosophila*. During my postdoctoral stay in in Prof FC Kafatos laboratory (1993-2000; Harvard University, USA; IMBB, Greece; EMBL, Germany), I became interested on the regulation of transcription factors involved in development. We characterized in *Drosophila* the *spalt-like* genes (*SALL*), a family of transcriptional regulators crucial in the development of the nervous system and limbs, where they mediate many of the functions of the TGFbeta pathway (Nature 1996). Mutations in these genes cause hereditary human rare diseases, such as Townes-Brocks syndrome (TBS). I obtained a Ramón y Cajal contract (2003-2008) to continue this project in collaboration with Prof JF de Celis (Prof A García-Bellido Lab 2001-2004, CBMSO, Madrid), where we deciphered the transcriptional circuit that regulates *SALL* genes during development (PNAS 2004).

Since December 2004 I am a principal investigator at CIC bioGUNE, where I continued my research on SALL family and UbLs. Our studies demonstrated that TBS individuals show anomalies in cilia formation and function due to the interaction of mutant SALL1 proteins with centrosomal/ciliary factors (Am J Human Genet 2018; eLife 2020). In addition, SALL factors are modified by the Small Ubiquitin-like MOdifier, SUMO, and this affects their transcriptional function. We discovered that SUMO is a key regulator of development, as well as a modulator of SALL function (Mol Biol & Evol 2016; PLoS Genetics 2013; Development 2008). We developed technologies for the identification of proteins modified by UbLs (Sci Reports 2017) and, more recently, **SUMO-ID** (Nat Comm 2021) for the identification of interactors of proteins of interest when modified, which have wide applications in the field of protein homeostasis to unravel the role of the UbLs in development and disease. More information: http://personal.cicbiogune.es/rbarrio/

**Internationalization and leadership:** I established numerous **national and international collaborations** and **I coordinated three European networks** in the field of the UbLs (ITN: UbiCODE 2018-2021, UPStream 2011-2015; COST PROTEOSTASIS 2013-2018, >200 groups); I participated in POCTEFA project PROTEOblood 2018-2022 and co-coordinator in Rare Disease Foundation grant (Canada 2018-2019). I am Spanish representative and Grant Award coordinator in ProteoCure COST Action (2021-2025). I am PI of national grants since 2005 and participated in national networks of excellence (UBIRed 2018-2019; Geneshape 2008-2012, 2015-2017). I participate in international and national committees for the evaluation of European and Spanish grants and I am regular reviewer for scientific journals.

I organized or co-organized **national and international congresses**, including the Symposium on UbLs at the Spanish Society of Biochem & Mol Biol SEBBM congress, Málaga 2022; 17th Meeting of the Spanish Society for Developmental Biology SEBD, virtual 2020; International Symposium: Writing and Editing the Ubiquitin Code, Bilbao 2020; UbiCODE Network Meetings: Toulouse 2017, Lisbon 2018; 1st Joint Congress SEBC-SEG-SEBD, Gijón 2017; PROTEOSTASIS Congresses: Valencia 2014, Croatia, 2015, Lisbon 2016, Athens 2018; UPStream Network Meetings: Bilbao 2012, Copenhagen 2013, Madrid 2014, Montpellier 2015.

**Training activities:** I directed 8 PhD Theses, 3 in progress, and trained 8 postdoctoral researchers. All continued their careers in international research centres, companies or training; I trained 9 master, 3 graduate, 26 undergraduate or visitors. I participate in the Master in Biomedicine and Mol Biology (UPV/EHU since 2007), in the Master in Dev Biology (UAM, Madrid 2010-2017) and I am member of the Training Committee at CIC bioGUNE since 2010.

**Outreach, dissemination and Mentoring:** I participated or organized communication activities including: hosting high schools students (Novia Salcedo Fundación since 2014); co-organization of the 1st Workshop Women in Science (CIC bioGUNE 2018); conferences to students on prospects in biomedicine (Bilbao 2015, 2017); conferences to medical doctors on proteostasis (Madrid 2016, Barcelona 2017, virtual 2022). I participate in **mentoring** activities, including EMBL LEAP programme for female post-docs since 2020 and mentorship program of the SEBBM.

**Evaluation activities**: Evaluation Committees AEI: BIO-BMC 2022, 2011, JdC 2020; MICINN 2019; External Expert BMC Area. EU 2015; Evaluation Committee FP7 Program EU 2011; Reviewer for Dutch Cancer Society 2017, 2020; GWIS National Fellowship USA 2017, 2018, 2019; MRC 2017; ProteoRed 2018, 2019, 2020; Netherlands Organisation for Scientific Research 2017.

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

**C.1. Publications** *(10 selected; Total publications: 87; Articles (international, indexed peer reviewed journals): 74; Q1: 66, D1: 40; Book chapters: 8; \*: corresponding author; h index: 30)*

**Articles:**

1. Barroso-Gomila O, Trulsson F, Muratore V,..., **Barrio R\***, Sutherland JD.\* (15/16) (2021) Identification of proximal SUMO-dependent interactors using SUMO-ID. *Nature Communications*, 12, 6671. D1, IF 14.919.

2. Bozal-Basterra L, Gonzalez-Santamarta M, Muratore V, …, Sutherland JD\*, **Barrio R\*** (9/9) (2021) LUZP1 controls cell division, migration and invasion through regulation of the actin cytoskeleton. *Front Cell Dev Biol*. 9:624089. Q1, IF 6,684.

3. Bozal-Basterra L, Gonzalez-Santamarta M, Muratore V,..., Sutherland JD\*, **Barrio R\*** (18/18) (2020) LUZP1, a novel regulator of primary cilia and the actin cytoskeleton, is a contributing factor in Townes-Brocks Syndrome. *eLife*, 9:e55957. D1, IF 7,551.

4. Mattern M, Sutherland JD, Kadimisetty J, **Barrio R**, Rodriguez MS\* (4/5) (2019) Using Ubiquitin binders to decipher the Ubiquitin Code. *TIBS* 44: 599-615. D1, IF 15.678.

5. Dissmeyer N, Coux O\*, Rodriguez MS, **Barrio R\***, CG PROTEOSTASIS (4/4) (2019) PROTEOSTASIS: A European network to break barriers and integrate science on protein homeostasis. *TIBS,* 44:383-387. D1, IF 15.678.

6. Bozal-Basterra L, Martín-Ruíz I, Pirone L,..., Sutherland JD\*, **Barrio R\*** (19/19) (2018) Truncated SALL1 impedes primary cilia function in Townes-Brocks Syndrome. *The American J of Human Genetics* 102:249–265. D1, IF 9,025.

7. Pirone L, Xolalpa W, Sigurðsson JO,..., **Barrio R\***, Sutherland JD\* (12/13) (2017) A comprehensive platform for the analysis of ubiquitin-like protein modifications using *in vivo* biotinylation. *Scientific Reports* 7:40756. Q1, IF 5,078.

8. Zabala-Letona A, Arruabarrena-Aristorena A, Martín-Martín N,..., Sutherland JD,..., **Barrio R**,…, Carracedo A\* (51/63) (2017) mTORC1-dependent AMD1 regulation sustains polyamine metabolism in prostate cancer. *Nature* 547:109-113. D1, IF: 40.137.

9. Ureña E, Pirone L, Chafino,..., **Barrio R\***, Martin D\* (10/11) (2016) Evolution of SUMO function and chain formation in insects. *Molecular Biology and Evolution* 33: 568-584. D1, IF 13,649.

10. Talamillo A, Herboso L, Pirone L,…, Sutherland JD, **Barrio R**\* (11/11) (2013) Scavenger receptors mediate the role of SUMO and Ftz-f1 in Drosophila steroidogenesis. *PLoS Genet*. 9(4):e1003473. D1, IF 8,52.

**Editorial activities:**

1. Proteostasis and Disease: From basic mechanisms to clinics (2022) Methods in Molecular Biology. Book. Springer Nature. Editors: **Barrio R**, Rodriguez MS.

2. Understanding the Ubiquitin Code (2022) Semin Cell Dev Biol. Elsevier ISSN 1084-9521. Special issue. Editors: **Barrio R**, Sutherland JD, Rodriguez MS.

3. 17th Edition of the Spanish Society for Developmental Biology Meeting: New Trends in Developmental Biology (2022) Front Cell & Dev Biol, ISSN 1664-8714. Special Issue. Editors: **Barrio R**, Araújo SJ.

4. Proteostasis and Disease: From basic mechanisms to clinics (2020). Book: Advances in Experimental Medicine and Biology, Volume 1233. Springer ISSN 0065-2598. Editors: **Barrio R**, Sutherland JD, Rodriguez MS.

5. Proteostasis: The network behind the networks (2019). Semin Cell Dev Biol, Volume 93. Elsevier ISSN 1084-9521. Special Issue Editors: **Barrio R**, Sutherland JD.

**C.2. Congresses** *(10 selected invited conferences; Presentations at Meetings: 120, 97 international; Invited conferences: 37.)*

1. New strategies for the analysis of Ubiquitin-like modifications (2022) EMBO Conference: Ubiquitin and ubiquitin-like proteins in health and disease; Cavtat, Croatia.

2. Ubiquitin-like modifications during development: from organs to organelles (2019). ICGEB, International Centre for Genetic Engineering and Biotechnology, Trieste, Italy.

3. Ubiquitin-like modifications during development: from organs to organelles (2019). EMBO Meeting: Proteostasis: From organelles to organisms, Ericeira, Portugal.

4. Ubiquitin-like modifications during development: from organs to organelles (2019). Fundación Ramón Areces Workshop: Protein secretion and proteostasis, Madrid, Spain.

5. Ubiquitin-like modifications during development: from organs to organelles (2019). EMBO Conference: The ubiquitin system; Cavtat, Croatia.

6. SUMOylation during development (2016) 3rd PROTEOSTASIS Conference: Proteostasis and its Biological Implications, Lisbon, Portugal.

7. Studying the role of SUMO during development using biotinylation tools (2016). FASEB Conference on Ubiquitin and Cellular regulation, Big Sky, Montana, USA.

8. Addressing the role of SUMO during development using biotinylation tools (2015). EMBO Conference: Ubiquitin and Ubiquitin-like Proteins: from molecular mechanisms to human diseases, Cavtat, Croatia.

9. Crosstalk between the Insulin and Ecdysone pathways during imaginal discs growth (2015) Insect Hormones Conference 2015, Kolymbari, Crete, Greece.

10. A comprehensive toolbox for the analysis of ubiquitin-like posttranslational modifications (2014). 1st PROTEOSTASIS Meeting, Valencia, Spain.

**C.3. Research projects** *(10 selected; Financed research projects: 29, 13 as PI; Coordination of 4 international projects).*

1. CA20113. ProteoCure: A sound proteome for a sound body: targeting proteolysis for proteome remodeling. *EU, COST*. 2021-2025. **Management Committee member**, **Grant Award coordinator.**

2. PID2020-114178GB-I00: *PROcilia: Protein homeostasis in development and disease: interplay of Ubiquitin-like and SALL* *factors in ciliogenesis*. *MICINN* 2021-2024. 217.800€. **Principal Investigator**.

3. EFA360/19. PROTEOblood: Red cooperativa franco-española para el análisis de proteinopatías y el desarrollo de terapias individualizadas en cánceres hematológicos. INTERREG POCTEFA, EU. 2018-2022. 1. 445. 913 €. **Partner PI** (PI Gaël Roué, JCLRI).

4. #2641. Drug-based modulation of primary cilia in Townes-Brocks Syndrome kidney models. Rare Disease Foundation, Canada. 2018-2019. 5.000,00 Canadian $. **Co-coordinator**.

5. SAF2017-90900-REDT. UBIRed: Papel de las proteínas de la familia ubicuitina en señalización, proliferación y cáncer. *MINECO* *Redes de Excelencia* 2018-2019. **Partner PI** (PI Oscar Fernandez-Capetillo, CNIO).

6. BFU2017-84653-P: Molecular mechanisms of SALL factors and Ubiquitin-likes and their physiological implications. *MINECO* 2018-2020. 169.400,00 €. **Principal Investigator**.

7. PITN-GA-2018-765445: UbiCODE: European Research Training to Decipher the Ub Code. *EU, ITN* 2018-2021. 3.407.194,44€. **Co-coordinator**.

8. BFU2014-57703- REDC: From Genes to Shapes. *MINECO* *Consolider* 2015-2017. 71,000€. **Partner PI** (PI Ginés Morata, CBMSO).

9. COST BM1307: PROTEOSTASIS, European network to integrate research on intracellular proteolysis pathways. *EU, COST*. 2013-2018. 641,000.00€. **Coordinator**.

10. PITN-GA-2011-290257: UPStream, European Research Training in the Ubiquitin Proteasome System. *EU, Marie Curie ITN* 2011-2015. 3,307,409€. **Coordinator**.