MINISTERIO DE CIENCIA E INNOVACIÓN

Cofinanciado por la Unión Europea

AGENCIA ESTATAL DE INVESTIGACIÓN

CURRICULUM VITAE ABREVIADO (CVA)

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

Part A. PERSONAL INFORMATION

First name	FERNANDO		
Family name	RODRIGUEZ PASCUAL		
Gender (*)	Male	Birth date	03/04/1968
DNI	52096964D		
e-mail	frodriguez@cbm.csic.es	http://www.cbm.uam.es/frodriguez	
Open Researcher and Contributor ID (ORCID) (*)		ORCID: 0000-0002-9765-9578	

(*) Mandatory

A.1. Current position

Position	Staff scientist (Científico Titular) CSIC		
Initial date	05/10/2009		
Institution	Consejo Superior de Investigaciones Científicas (CSIC)		
Department/Center	Tissue and Organ Homeostasis	Centro de Biología Molecular "Severo Ochoa" (CSIC-UAM)	
Country	Spain	Phone	+34911964505
Key words	Lysyl oxidases, extracellular matrix, collagen, fibrosis, cardiovascular diseases, hypoxia		

A.2. Previous positions (research activities, interruptions)

Period	Position/Institution/Country/Cause of the interruption
October 1991-April 1997	Veterinary Faculty. Complutense University Madrid. PhD student.
September 1997-August 1999	Pharmacology Department. University of Mainz (Germany). Postdoctoral Fellow FEBS.
September 1999-April 2000	Pharmacology Department. University of Mainz (Germany). Postdoctoral Fellow University Mainz.
April 2000-December 2003	CIB-CSIC. Posdoctoral Fellow.
December 2003- November 2008	CIB-CSIC. Postdoctoral Fellow Ramon y Cajal Program.
December 2008-October 2009	CIB-CSIC. Postdoctoral I3.

A.3. Education

Degree	University	Year
BSc in Chemistry	Universidad Complutense de Madrid	1991
PhD in Biochemistry	Universidad Complutense de Madrid	1997

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

I graduated in Chemistry from the Universidad Complutense de Madrid (1991) and got my PhD degree in Biochemistry from the same university in 1997 with an experimental work on the role of nitric oxide in neurosecretion performed in the Department of Biochemistry of the Veterinary Faculty (Supervisors: Mª Teresa-Miras Portugal and Magdalena Torres). Afterwards, I moved to the Department of Pharmacology of the Johannes Gutenberg University in Mainz (Germany) where I spent a three-year post-doctoral period, first as a FEBS fellow and then hired by the university, to work on the regulation of the expression of the enzyme inducible nitric oxide synthase (iNOS) in human cells. In 2000, I came back to Spain and joined the group of Santiago Lamas in the Center for Biological Research (*Centro de Investigaciones Biológicas*, CIB-CSIC) where I worked on the analysis of the regulation of the expression of the vasoconstrictor peptide endothelin-1 and its profibrotic actions. During this period, I progressively developed my own research line with a contract from the Ramon y Cajal program (2003-2008), and then, in 2009, with a position of Staff Scientist in the Centre for Molecular Biology (*Centro de Biología Molecular "Severo Ochoa"*, CBMSO, CSIC). In this institute, I have consolidated my independent research activity on the role of the extracellular matrix remodeling in the cardiovascular system, with particular interest on the contribution of the members of the lysyl oxidase (LOX) family to the development of cardiovascular diseases. Within this context, in the last years my group has explored various research lines including:

1) **Remodeling of the extracellular matrix in the cardiovascular system. Role of the LOX enzymes in the development of aneurysms in Marfan syndrome and in the heart response to myocardial infarction.** In the last few years, my group has dedicated a significant effort to the analysis of the role of matrix remodeling enzymes in cardiovascular pathology. Within this line, this work has revealed an important function of the members of the LOX family in the development of aortic aneurysms in Marfan syndrome, as well as in the infarcted heart.
2) **Analysis of the mechanisms for the regulation of the expression and activity of LOX enzymes.** In this regard, the group has investigated, first, the biochemical properties of the less known member of the LOX family, the LOXL4 enzyme, and more recently, the regulation of the biological activity of these proteins by proteolytic processing, mainly focused on the isoforms LOX and LOXL1.
3) **Phylogenetic analysis of the LOX family and collagens as their main substrate.** To acquire a more detailed knowledge about the biochemical properties of these enzymes, my group has also performed a series of phylogenetic studies on the members of the LOX family, as well as on collagens, their natural substrates. This work has provided valuable information on the evolution of this family of enzymes in the context of the extracellular matrix.
4) **Biotechnological applications of the biology of the LOX family. Production of extracellular matrices for the use in bioengineering.** More recently, my group has established a genuine line of research on the development of protocols for the analysis of the extracellular matrix and the potential application of the knowledge on the biology of the LOX family in the development of matrices for tissue repair. In this context, I published several method papers on this topic and developed a patent-protected protocol for the potentiation of the in vitro synthesis and deposition of collagen by using the enzyme LOX.
5) **Role of the hypoxia in the regulation of the expression of collagen remodeling enzymes.** My group has also analyzed the contribution of the hypoxia/hypoxia inducible factor (HIF) signaling to the expression of collagen remodeling enzymes such as prolyl and lysyl hydroxylases and their involvement in the development of fibrosis.

The group has obtained uninterrupted funding from competitive agencies, with grants from the Ministry of Science and Innovation (SAF2009, SAF2012 and 2015, Retos 2018), from regional sources, as well as contracts with private foundations (The Glaucoma Foundation), or with pharmaceutical companies interested in our research, such as Pharmaxis. I am the author of 65 publications (28 in the last 10 years, 14 as corresponding author) cited 2846 times, *h* index 31 (Scopus, Author ID: 6603047593). As to Google Scholar, my citations are 3763 with a *h* index of 36 at position 6177 in the ranking of Spanish scientists for all disciplines (www.webometrics.info).

Part C. RELEVANT MERITS

C.1. Publications (only the most relevant).

Original articles:

1) **Rodriguez-Pascual F**, Rosell-Garcia T. (2022) The challenge of determining lysyl oxidase activity: Old methods and novel approaches. *Analytical Biochemistry* 639: 114508.
2) Rosell-García T, Rivas-Muñoz S, Colige A, **Rodriguez-Pascual F**. (2022) Cleavage of LOXL1 by BMP1 and ADAMTS14 Proteases Suggests a Role for Proteolytic Processing in the Regulation of LOXL1 Function. *International Journal of Molecular Sciences* 23(6):3285.
3) Rosell-García T, **Rodríguez-Pascual F**. (2021) Techniques to assess collagen synthesis, deposition, and cross-linking in vitro. *Methods in Molecular Biology* 2299:115-122.
4) Rosell-García T, **Rodríguez-Pascual F.** (2020) Boosting collagen deposition with a lysyl oxidase/bone morphogenetic protein-1 cocktail. *Methods in Cell Biology* 156:259-270.
5) Rosell-García T, Palomo-Álvarez O, **Rodríguez-Pascual F**. (2019) A hierarchical network of hypoxia-inducible factor and SMAD proteins governs procollagen lysyl hydroxylase 2 induction by hypoxia and transforming growth factor β1. *Journal of Biological Chemistry*. 294(39):14308-14318.
6) Rosell-García T, Paradela A, Bravo G, Dupont L, Bekhouche M, Colige A, **Rodriguez-Pascual F.** (2019) Differential cleavage of lysyl oxidase by the metalloproteinases BMP1 and ADAMTS2/14 regulates collagen binding through a tyrosine sulfate domain. *Journal of Biological Chemistry* 294(29):11087-11100.

7) **Rodríguez-Pascual, F.** (2019) “How evolution made the matrix punch at the multicellularity party”. *Journal of Biological Chemistry*, 294 (3), pp. 770-771. Invited Editorial.
8) Rosell-García T, **Rodríguez-Pscual F**. (2018) “Enhancement of collagen deposition and cross-linking by coupling lysyl oxidase with bone morphogenetic protein-1 and its application in tissue engineering”, *Scientific Reports*, 8 (1):10780.
9) **Rodríguez-Pascual F**, Rosell-García T. (2018). “Lysyl oxidases: Functions and Disorders”, *Journal of Glaucoma*, Suppl 1: S15-S19. Invited Review.
10) Siegert AM, Serra-Peinado C, Gutiérrez-Martínez E, **Rodríguez-Pascual F**, Fabregat I, Egea G. (2018). “Altered TGF-β endocytic trafficking contributes to the increased signaling in Marfan syndrome". *Biochim Biophys Acta, Molecular Basis of Disease*, 1864(2):554-562.
11) **Rodríguez-Pascual F**, Díez J. (2017). "Myocardial fibrosis in response to pressure overload: elucidating the contribution of tissue transglutaminase ". *Cardiovascular Research,* 113(8):841-843. Invited Editorial.
12) **Rodríguez-Pascual F**, Slatter DA. (2016). “Collagen cross-linking: insights on the evolution of metazoan extracellular matrix”. *Scientific Reports*, 6:37374.
13) González-Santamaría J, Villalba M, Busnadiego O, Lopez-Olaneta MM, Sandoval P, Snabel JM, Lopez-Cabrera M, Erler JT, Hanemaaijer R, Lara-Pezzi E, **Rodriguez-Pascual F**: (2015) “Matrix cross-linking lysyl oxidases are induced in response to myocardial infarction and promote cardiac dysfunction”, *Cardiovascular Research,* 109:67-78.
14) Busnadiego O, Gorbenko Del Blanco D, González-Santamaría J, Habashi JP, Calderon JF, Sandoval P, Bedja D, Guinea-Viniegra J, Lopez-Cabrera M, Rosell-Garcia T, Snabel JM, Hanemaaijer R, Forteza A, Dietz HC, Egea G, **Rodriguez-Pascual F** (2015). "Elevated expression levels of lysyl oxidases protect against aortic aneurysm progression in Marfan syndrome". *Journal of Molecular and Cellular Cardiology*, 85:48-57**.** Destacado por un editorial en la revista.
15) Grau-Bové X, Ruiz-Trillo I, **Rodríguez-Pascual F** (2015). "Origin and evolution of lysyl oxidases". *Scientific Reports*, 5:10568.
16) Crosas-Molist E, Meirelles T, López-Luque J, Serra-Peinado C, Selva J, Caja L, Del Blanco DG, Uriarte JJ, Bertran E, Mendizábal Y, Hernández V, García-Calero C, Busnadiego O, Condom E, Toral D, Castellà M, Forteza A, Navajas D, Sarri E, **Rodríguez-Pascual F**, Dietz HD, Fabregat I, Egea G (2015). "Vascular Smooth Muscle Cell Phenotypic Changes in Patients with Marfan Syndrome". *Arteriosclerosis Thrombosis and Vascular Biology*, 35(4):960-72.

Book chapters:

1) **Rodríguez-Pascual F**. (2021). “The Evolutionary Origin of Elastin: Is Fibrillin the Lost Ancestor?". In book: Extracellular Matrix: Developments and Therapeutics. DOI: 10.5772/intechopen.95411.
2) **Rodríguez-Pascual F**, Coto E. (2014). “La biología molecular en el diagnóstico y tratamiento de las enfermedades renales". Nefrología Clínica 4ª edición. L. Hernando Ed. Médica Panamericana, 39-48. ISBN: 978-84-9835-710-3.
3) **Rodríguez-Pascual F**, Caramelo C, Lamas S (2014): "Fisiopatología de la pared vascular". Nefrología Clínica 4ª edición. L. Hernando Ed. Médica Panamericana, 255-268. ISBN: 978-84-9835-710-3.

C.2. Participations in Congresses.

A short list of the most relevant participations in meetings and congresses in the last years:

1) June 2019: Invited Lecture for the Twenty-Sixth Annual Glaucoma Foundation Optic Nerve Rescue and Restoration Think Tank. New York, USA.
2) June 2018: Invited Lecture for the Twenty-Fifth Annual Glaucoma Foundation Optic Nerve Rescue and Restoration Think Tank. New York, USA.
3) June 2016: Invited Lecture for the TGF-beta family in fibrosis and cancer. IT-LIVER Final Conference. Barcelona, Spain.
4) June 2016: Poster for the meeting “Mechanical forces in physiology and disease”, CNIC. Madrid, Spain.
5) September 2016: Invited speaker for the 17th International Amine Oxidase Conference and Workshop. Birmingham, UK.

C.3. Research projects and grants.

1) The Glaucoma Foundation 2017 Research Grants. " Role of lysyl oxidase-like 1 (LOXL1) proteolytic processing in the development of pseudoexfoliation syndrome (PEX)". 01/06/2017-31/05/2018. 40.000$. Extension: "Unraveling the Proteolytic Landscape Regulating LOXL1. Implications in the Development of Pseudoexfoliation Syndrome" 01/08/2019-31/07/2020. PI Fernando Rodríguez Pascual. 60.000 $.
2) RTI2018-095631-B-I00. "Proteolytic activation of lysyl oxidases: Biotechnological applications and contribution to extracellular matrix remodeling in the development of human diseases". Spanish Ministry of Science 2018. PI: Fernando Rodríguez Pascual. 01/01/2019-30/9//2022. 118.580 €.
3) SAF2015-65679-R. "Role of the lysyl oxidase family in the development of cardiovascular diseases: Analysis of mechanistic insights and therapeutic options". Spanish Ministry of Science 2015. PI: Fernando Rodríguez Pascual. 01/01/2016-31/12/2018. 121.000 €.
4) SAF2012-34916. "Role of the lysyl oxidase family in the pathogenesis of connective tissue diseases: contribution of the aortic alterations of Marfan syndrome and related disorders". Spanish Ministry of Science 2012. PI: Fernando Rodríguez Pascual. 01/01/2013-31/12/2015. 140.400 €.
5) SAF2009-09085. "Role of endothelin-1 in the pathophysiology of the fibrotic processes". Spanish Ministry of Science 2009. PI: Fernando Rodríguez Pascual. 01/01/2010-31/12/2012. 120.000 €.

C.4. Contracts, technological or transfer merits.

1) Pharmaxis Ltd (Australia). Industrial contract "Development of a luminiscence complementation reporter system for the analysis of LOXL2 interactions with collagen and tropoelastin in cells" 01/04/2021-30/06/2021. 4.000 €. "Generation of cells overexpressing LOXL1, LOXL2 and LOXL4". 01/01/2014-31/12/2015. 15.500 €. PI: Fernando Rodríguez Pascual (CSIC).
2) Actelion Pharmaceuticals. Industrial contract "Role of the axis transforming growth factor-β (TGF-β)/endothelin-1 (ET-1) vascular pathophysiology cular. Effect of the mixed ETA/ETB antagonist bosentan. Animal models for the analysis of the expression of ET-1 and its effects". PI: Fernando Rodríguez Pascual (CSIC). 01/01/2007-01/09/2009. 30.000 €.
3) Patent: Extracellular matrix and its use for regulating the differentiation of mesenchymal stem cells. Inventors: Rodríguez-Pascual F, Rosell-García T (2017). CSIC.

C.5. Teaching experience.

I have supervised four Doctoral theses (Cristina Castañares 2009, David Lagares 2012, Oscar Busnadiego 2014, and Tamara Rosell 2020), all of them with the best qualification: sobresaliente "*cum laude*". I have also supervised student-trainees TFG or TFM (Monica Escobar 2013, Oscar Palomo 2018, Silvia Alcaraz 2022).

Specific teaching activities (only those related with the topic of this grant):

1) Speaker of the lecture "Mechanisms of Cellular Signaling", University Máster in Biochemistry, Molecular Biology and Biomedicine from the Department of Biochemistry and Molecular Biology, Complutense University (since 2008).
2) Speaker of the course: "Role of endothelin in cancer and other pathological processes", International University Menéndez Pelayo, Valencia 2006.
3) Speaker in the Summer Workshop "Novel approaches in human tissue fibrosis", Alcalá de Henares University (2011-2012, 2014-2015).

C.6, Other merits.

"Iñigo Alvárez de Toledo" Nephrology Prize 2007. Basic Research: "Regulation of the expression of endothelin-1: from the transcription to the tissue fibrosis".
Member of the Editorial Board (Molecular Biology Section) of the journal "Scientific Reports", Asia-Pacific Journal of Ophthalmology (Visual Sciences Section), Molecular Biology Reports (Extracellular Matrix Biology Section) and the International Journal of Molecular Sciences.
Annonymous reviewer in the topic Extracellular Matrix for journals including Nature Medicine, Oncogene, PLOS One, Gene, Biomaterials and Biosystems, Eye and Vision, Developmental Dynamics, Kidney International, among many others.
Participation in grant evaluations: Ramon y Cajal 2006, 2007 and 2016, and *Excelencia/Retos* 2014 programmes, *ad hoc* grant reviewer since 2003 (AEI).
Member of the Spanish Society for Biochemistry since 1992.