MINISTERIO DE CIENCIA E INNOVACIÓN

Cofinanciado por la Unión Europea

AGENCIA ESTATAL DE INVESTIGACIÓN

CURRICULUM VITAE (CVA)

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

Part A. PERSONAL INFORMATION

CV date	24/01/2022

First name	María Dolores		
Family name	Pérez-Sala Gozalo		
Gender (*)	F	Birth date (dd/mm/yyyy)	03/01/1961
Social Security, Passport, ID number	06979506H		
e-mail	dperezsala@cib.csic.es	URL Web: https://www.cib.csic.es/research/structural-and-chemical-biology/posttranslational-modification-proteins	
Open Researcher and Contributor ID (ORCID) (*)		0000-0003-0600-665X	

(*) Mandatory

A.1. Current position

Position	Staff scientist/Investigadora científica CSIC			
Initial date	13/06/2006			
Institution	Consejo Superior de Investigaciones Científicas			
Department/Center	Structural and Chemical Biology	Centro de Investigaciones Biológicas Margarita Salas		
Country	Spain		Teleph. number	918373112 ext 4212
Key words	Protein posttranslational modification, isoprenylation palmitoylation endosomal GTPases, electrophilic lipids, lipoxidation, drug action, cysteine modifications, cytoskeleton, intermediate filaments.			

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

Period	Position/Institution/Country/Interruption cause
2000-2006	Científico Titular, CIB, CSIC
1992-2000	Postdoctoral, CIB, CSIC
1987-1991	Postdoctoral, Harvard Medical School, Boston, USA
1984-1987	Predoctoral, CIB, CSIC

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Medicine	U Extremadura	1983
Medicine	U Complutense de Madrid	1987

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

Scientific contributions and research lines. During my **PhD**, we showed for the first time that amino acids can regulate the rate of protein synthesis independently of their role as substrates, a concept universally accepted nowadays.

During the **postdoctoral stay at Harvard Medical School**, our group was pioneer in the characterization of the posttranslational modifications of retinal G proteins (first description of their isoprenylation and methylation and of the activity of retinal isoprenylated-protein methyltransferase and esterase). This work led to the design and characterization of inhibitors of these enzymes that have been later commercialized and have been the basis for the design of compounds currently in trials as anticancer agents and as agents for the treatment of premature aging syndromes like Progeria. During the **postdoctoral stay at CIB-CSIC** I published the first reports on the induction of tumor cell apoptosis by inhibitors of isoprenylation and methylation. Later on I contributed to elucidate the role of isoprenylation in the generation of endothelial vasoactive factors: nitric oxide and endothelin-1. This led to the identification of novel mechanisms for the beneficial actions of statins on cardiovascular function, with clinical impact allowing new indications for these compounds and precautions for their use. As a **group leader**, I undertook studies on the isoprenylation and palmitoylation of small GTPases, Ras and Rho proteins, unveiling novel mechanisms of regulation, leading to the design of inhibitors and patents. Moreover, our group identified a peptide sequence eliciting lysosomal targeting in cells from diverse species. In collaboration with a National consortium on Drug Allergy, we studied the modification of proteins by drugs, leading to the Identification of serum and cellular targets of amoxicillin, potentially involved in allergic reactions, and to the demonstration of the transfer of haptenated proteins between cells in exosomes, with impact on allergic reactions mechanisms. The study of protein posttranslational modification by electrophilic lipids (lipoxidation) led to the first identification of protein targets of electrophilic prostaglandins and the role of protein modification in the antiinflammatory effects of these mediators, which have yielded publications and patents. Research in this line has led to the identification of the molecular basis for stress sensing by the intermediate filament proteins vimentin and GFAP. We have unveiled a vimentin-zinc interaction important for basal vimentin function, and implications in the pathological alterations of zinc deficiency, and have identified novel roles of vimentin and GFAP in mitosis. These findings have an impact in disease, including tumorigenesis and neurodegeneration due to alterations of GFAP. Moreover, we have formulated a hypothesis on the role of vimentin in viral infections and its potential as target for SARS-CoV-2. Most of these findings have been communicated through publications and scientific meetings and have yielded patent applications. Our research has been funded by regional, national and international institutions, both from the public and private sectors. Our group participates in national and international networks and consortia, some of which coordinated by our group, of which I am the PI since 2003.

The group has **contributed to society** by disseminating scientific knowledge through activities for the general public, collaborated with the private sector through collaboration agreements or in the context of international consortia, and through the organization of conferences for the general public and dissemination in social media.

Finally, we have carried out a broad **training activity**, with the supervision of 13 Doctoral Thesis and numerous Degree and Master Thesis. I participate in several Master programs of different universities and in the Master on Synthetic and Integrative Biology CIB-CSIC/UIMP. We have participated in International Training Networks, organization of symposia for young researchers, summer schools for scientific societies, research consortia and international actions. Researchers trained at our group are incorporated in academia, private companies and hospitals. I have participated in several Editorial Boards of scientific journals (Infl. Allergy Drug Targets, Free Rad Res, Antioxidants), I have acted as guest Editor for several journals (Redox Biol, Frontiers). I have participated in the evaluation of researchers and grants and in evaluation committees for national and international institutions (Ireland, Italy, Argentina), and in the evaluation of research projects from private companies.

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

C.1. Publications *(see instructions)*

Selected publications from the last 5 years from more than 120 available in Pubmed: http://www.ncbi.nlm.nih.gov/pubmed/?term=perez-sala+d; In Google Scholar: https://scholar.google.es/citations?hl=es&user=uftpcncAAAAJ&view_op=list_works&sortby=pubdate. *H index 43, more than 8000 citations.* ☒Corresponding author.

1.Griesser E, Vemula V, Mónico A, Pérez-Sala D☒, Fedorova M. "Dynamic posttranslational modifications of cytoskeletal proteins unveil hot spots under nitroxidative stress". Redox Biol. 2021 Aug;44:102014. doi: 10.1016/j.redox.2021.102014.

2.Mónico A, Guzmán-Caldentey J, Pajares MA, Martín-Santamaría S, Pérez-Sala D.☒ "Molecular Insight into the Regulation of Vimentin by Cysteine Modifications and Zinc Binding" Antioxidants 2021 Jun 28;10(7):1039. doi: 10.3390/antiox10071039.

3.Ramos I, Stamatakis K, Oeste CL, Pérez-Sala D.☒ "Vimentin as a Multifaceted Player and Potential Therapeutic Target in Viral Infections" (2020) Int J Mol Sci.21:4675. doi: 10.3390/ijms21134675.

4.Duarte S, Viedma-Poyatos A, Navarro-Carrasco E, Martínez AE, Pajares MA, Pérez-Sala D☒ "Vimentin filaments interact with the actin cortex in mitosis allowing normal cell division" NAT COMMUN (2019) 10, 4200.

5.Mónico A, Duarte S, Pajares MA, Pérez-Sala D.☒ "Vimentin disruption by lipoxidation and electrophiles: Role of the cysteine residue and filament dynamics" REDOX BIOL (2019) 101098.

6.Viedma-Poyatos, Á., de Pablo, Y., Pekny, M., Pérez-Sala, D.☒ "The cysteine residue of glial fibrillary acidic protein is a critical target for lipoxidation and required for efficient network organization". FREE RAD. BIOL. MED. (2018) **120,** 380-394.

7.Sánchez-Gómez FJ, González-Morena JM, Vida Y, Pérez-Inestrosa E, Blanca M, Torres MJ, Pérez-Sala D.☒" Amoxicillin haptenates intracellular proteins that can be transported in exosomes to target cells" (2017) ALLERGY **72,** 385-396.

8.Díez-Dacal, B., Sánchez-Gómez, F.J., Sánchez-Murcia, P.A., Milackova, I., Zimmerman, T., Ballekova, J., García-Martín, E., Agúndez, J.A., Gharbi, S., Gago, F., Stefek, M., Pérez-Sala, D.☒ "Molecular interactions and implications of aldose reductase inhibition by PGA_1 and clinically used prostaglandins" (2016) MOL. PHARMACOL. **89,** 42-52.

9.Pérez-Sala, D.☒, Oeste, C.L., Martínez A.E., Carrasco, M.J., Garzón, B., Cañada, F.J. "Vimentin filament organization and stress sensing depend on its single cysteine residue and zinc binding" (2015) NAT. COMMUN. 6:7287.

10.Díez-Dacal, B., Gayarre, J., Gharbi, S., Timms, J.F., Coderch, C., Gago, F., and Pérez-Sala, D.☒ "Identification of aldo-keto reductase AKR1B10 as a selective target for modification and inhibition by PGA_1: Implications for anti-tumoral activity" (2011) CANCER RES. **71,** 4161-4171.

C.2. Congresses

- Pérez-Sala, D. "Modifications of cysteine residues in the generation of structurally and functionally diverse protein species". 20th Biennial Meeting of SFRR International. Online Congress 15–18 March 2021. Symposium 13.2. Abstract published in: Free Rad Biol Med. (2021) 165: 15. https://doi.org/10.1016/j.freeradbiomed.2020.12.286. Invited talk.
- Mónico, A., Viedma-Poyatos, A., Duarte, S., Pajares, MA, Pérez-Sala, D. "Electrophilic and oxidative modifications of vimentin in physiology and pathophysiology" 11th European intermediate filament meeting EuroIF. 9th – 11th June 2019, Turku, Finland. Invited talk.
- Pérez-Sala, D. "Avances en proteómica en alergia a fármacos". XXXI Congreso de la Sociedad Española de Alergología e Immunología Clínica. Valencia, 24-27 Octubre 2018. Invited talk.
- Pérez-Sala, D. "GFAP as an Antenna Sensing the Oxidative Stress" Intermediate Filaments Gordon Research Conference. June 24 - 29, 2018. Lucca (Barga), Italy. Oral communication.

- Pérez-Sala, D. “Modification of cysteine residues by cyclopentenone prostaglandins in the elucidation of redox regulation of protein function” EUROTOX2016. 52th European Congress of the European Societies of Toxicology. Seville, Spain, September 4-7, 2016. Invited Speaker. *Abstract published in Toxicol. Lett. (2016) vol. 258, page, S44.*
- Pérez-Sala, D. “Oxidative Stress and Interaction with Zinc Expose Hidden Features of Intermediate Filaments". Intermediate Filament Gordon Research Conference. Stoweflake Conference Center, Stowe, VT, USA. June 12-17, 2016. Invited Speaker
- Pérez-Sala, D. “Candidate proteins for drug adduct formation and immunogenicity”. 7th Drug Hypersensitivity Meeting. European Academy of Allergy and Clinical Immunology. Málaga, April, 21-23, 2016. Invited Speaker,
- Pérez-Sala, D. “Electrophilic prostaglandins: identification of protein targets and opportunities for drug discovery” Meeting of the Society for Free Radical Research, Europe (SFRR-E 2014): “Free radicals: insight in signaling and adaptative homeostasis”. Cordeliers Campus, Paris 6ème, France, September 5th - 7th, 2014. Invited lecture.

C.3. Research projects (selected)

-“From GFAP mutations in astrocytes to neurodegeneration: exploring a lipidprotein oxidation pathway” Fundación La Caixa HR21-00259. IP and coordinator of five groups. (1M €) 15-12-2021-15-12-2024.
-“Validation of vimentin as a co-receptor for SARS-CoV-2 and intervention strategies”. CSIC PTI Global Health (PIE 202020E223/CSIC-COV19-100). CIB Margarita Salas, CSIC. 22-06-2020 al 21-06-2021. 100.000 €. IP: D. Pérez-Sala
-Acción COST EpiLipidNET. Pan-European Network in Lipidomics and Epilipidomics. CA19105. Management Committee member. 13 Oct 2020-12 Oct 2024.
-“The astrocyte nanofilament system in Alexander disease – from molecules to function, uncovering new leads for therapy” EJPRD2019-256 “ALEXANDER”. H2020. European Joint Program on Rare Diseases, Joint Transnational Call for proposals 2019. 3 years. International Consortium. IP of CIB group.
-“Proteoforms in pathophysiology and drug action: focus on intermediate filament proteins and selected drug targets” PROFOUND. MICINN, RTI2018-097624-B-I00. (Cofunded FEDER) 157.300 €. CIB-CSIC. 01-01-2019 al 30-09-2022. IP: D. Pérez-Sala.
-EU Project 675132 (H2020-MSCA-ITN-2015). “MASS Spectrometry TRaining network for Protein Lipid adduct Analysis”: MASSTRPLAN. (2015-2019). 495.745 €. CIB-CSIC. IP CSIC: D. Pérez-Sala.
-RETIC: “Asma, reacciones adversas y alérgicas” (ARADYAL). Fondo de Investigaciones Sanitarias, Instituto de Salud Carlos III, Ref. RD16/0006/0021. 2017-2021. 107.937,50 €. IP: D. Pérez-Sala.
-“Protein modification by lipoxidation and drug addition: novel perspectives for exploring disease mechanisms and therapeutic strategies” PROLIPADD, MINECO SAF-2015-68590-R (cofunded FEDER). 192.390 €. CIB-CSIC. 1-1-2016 a 31-12-2018. IP, D.P-S.
-Participation in COST Action EuroCellNet CA15214. MC substitute.Participation in COST Action TD1304 Zinc-Net: the Network for the Biology of Zinc. 2014-2017 MoU : 038/13.
-RETIC: “Red de Investigación de reacciones adversas a alergenos y fármacos” (RIRAAF) Fondo de Investigaciones Sanitarias, Instituto de Salud Carlos III, Ref. RD12/0013/0008 2013-2016. 167.375 €. CIB-CSIC, IP: D. Pérez-Sala.

C.4. Contracts, technological or transfer merits (selected)

- Patent: “Uso de compuestos con estructura 2-ciclopentenona para la inhibición de enzimas de la familia de las aldo-keto reductasas”. Dolores Pérez-Sala y Beatriz Díez Dacal. March 25, 2013 Nº ES2365587; Date, 20/02/2013.
- Patent: “Use of 5-carboxymethyl-3-mercapto-1,2,4-triazino-[5,6-b]indoles and their pharmaceutical composition”. Milan Stefek, Ivana Milackova, Beatriz Díez Dacal, Dolores Pérez-Sala Gozalo, Marta Soltesova-Prnova. PCT: WO2015/057175 A, 23-4-2015. Slovakia.

Transfer of numerous reagents and tools generated in projects through MTA.