



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

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| CV date | 13/10/2022 |
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| First name | María Dolores | | |
| Family name | Herrera González | | |
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(*) Mandatory

A.1. Current position

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|-------------------|--|--------------------|--|
| Position | Catedrática de Universidad | | |
| Initial date | 30/04/2010 | | |
| Institution | University of Seville | | |
| Department/Center | Pharmacology | School of Pharmacy | |
| Country | Spain | | |
| Key words | cardiovascular pharmacology, atherosclerosis, vascular endothelium, endothelial dysfunction, metabolic syndrome, obesity, olive oil, rice bran | | |

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

| Period | Position/Institution/Country/Interruption cause |
|-----------------------|---|
| 01/04/1987-31/12/1990 | Becaria FPU |
| 02/05/1991-01/05/1996 | Profesor Ayudante de Universidad |
| 02/05/1996-13/03/1997 | Profesora Asociada |
| 14/03/1997-29/04/2010 | Profesora Titular de Universidad |

A.3. Education

| PhD, Licensed, Graduate | University/Country | Year |
|-------------------------|-----------------------------|------|
| Licensed in Pharmacy | University of Seville/Spain | 1986 |
| Ph.D. in Pharmacy | University of Seville/Spain | 1990 |

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

University Professor belonging to the teaching and research staff of the University of Seville (School of Pharmacy) from 1990, that translates into 6 five-year teaching and 5 research six-year periods (CNEAI). To complete my training, I have made stays in national and international research centers that have allowed frequent collaboration and joint published works (1. King's Collage London. Biomedical Sciences Division. Pharmacology Group. London (U.K.). 2.Department of Biomedicine, Pharmacology, Aarhus University, Denmark. 3.Departamento de Farmacología. Escola Paulista de Medicina. Sao Paulo (Brasil). 4.Centre de reserche sur le vieillissement. Research Center on Aging. University of Sherbrooke. Canadá. 5.Departamento de Farmacología. Facultad de Farmacia. Universidad de Granada. España).



The line of research on which I have been working for years has been the study of pharmacological strategies that improve vascular and endothelial function and all those cardiovascular pathologies, including atherosclerosis, using in most cases natural products (olive oil, derived from grape pomace and olive oil and rice bran, as well as active ingredients of a polyphenolic nature). We have worked with models of hypertensive animals (SHR), metabolic syndrome (Zucker rats) and with atherosclerotic diseases (ApoE mice). We have also directed our research in the study of the influence of diets supplemented with natural products and their benefit in models of insulin resistance and diet-induced obesity.

All this research activity has resulted in numerous scientific publications in recognized journals with a good impact index (Q1) (section C1). All as a result of the support y active participation in research projects, both in the direction of I+D+i projects financed in competitive calls as contracts or non-competitive I+D+i projects with administrations or public or private entities (principal investigator: 4 of them) (section C3).

One of them was in collaboration with industria and technological development granted by the National Plan for Research, Development and Technological Innovation (INNPACTO subprogram), which generated new knowledge in olive oil production with OLEAPURE company. We also collaborate in a project with the company NEOCODEX within the CENIT projects aimed at obesity control (PRONAOS). I am also the author of a patent invention "Procedure for obtaining enzymatic extracts with pharmacological activity from grape pomaceas a result of the project "Obtaining and scaling to pilot plant of enzymatic extracts" OPN-TRACE program (section C4).

The current scientific objectives of my research are the development of project: "Active nanotransporters of cannabinoids for the treatment of atherosclerosis" within the framework of FEDER Operational Program of Andalusian 2014-2020, that combines the use de new technologies by researchers from research group PAIDI Investigation and Techonological Progress in Nanomedicine (CTS480) and the experience of our team Cardiovascular Pharmacology (CTS178) in atherosclerosis and natural products, of which we have already presented several communications to Congresses (section C2).

I have contributed to the training of young researchers (Director of 11 doctoral theses, most of them with international mention and 2 with extraordinary doctorate award), being currently 4 of them, university professors (University of Seville and International University of Cataluña)

Research management and evaluation:

I am also responsible for the research group CTS-178 of the Andalusian Plan for Research, Development and Innovation: "Cardiovascular Pharmacology".

Experience in project evaluation of the Evaluation Management System of the National Agency for Evaluation and Prospecting (ANEP) of the Ministry of Science and Innovation.

Other merits: Academic of the Latin American Academy of Pharmacy.

Part C. RELEVANT MERITS (sorted by typology)

C.1. Publications (see instructions)

C.1.1. Claro-Cala CM, Quintela JC, Pérez-Montero M, Miñano J, de Sotomayor MA, Herrera MD, Rodríguez-Rodríguez AR. 2020. Pomace Olive Oil Concentrated in Triterpenic Acids Restores Vascular Function, Glucose Tolerance and Obesity Progression in Mice. *Nutrients*. 12(2):323. (IF:5.717) Q1/T1/D2 Nutrition & Dietetics 17/89. SCOPUS (5), WOS (6).

C.1.2. Perez-Ternero C, Werner CM, Nickel AG, Herrera MD, Motilva MJ, Böhm M, Alvarez de Sotomayor M, Laufs U. 2017. Ferulic acid, a bioactive component of rice bran, improves oxidative stress and mitochondrial biogenesis and dynamics in mice and in human mononuclear cells. *Journal of Nutritional Biochemistry* 48:51-61. (IF:4.414) Q1/T1/D2 Nutrition & Dietetics 15/83. SCOPUS (33), WOS (33).

C.1.3. Perez-Ternero C, Macià A, de Sotomayor MA, Parrado J, Motilva MJ, Herrera MD. 2017. Bioavailability of the ferulic acid-derived phenolic compounds of a rice branenzymatic



extract and their activity against superoxide production. *Food & Function* 8(6):2165-2174. (IF:3.289) Q1/T1/D2 Food Science & Technology 20/133. SCOPUS (17), WOS (16).

C.1.4. Perez-Ternero C, Herrera MD, Laufs U, Alvarez de Sotomayor M, Werner C. 2017. Food supplementation with rice bran enzymatic extract prevents vascular apoptosis and atherogenesis in ApoE^{-/-} mice. *Eur J Nutr.* 56(1):225-236. (IF:4.423) Q1/T1/D2 Nutrition & Dietetics 14/83. SCOPUS (13), WOS (8).

C.1.5. Perez-Ternero C, Rodriguez-Rodriguez R, Herrera MD, Alvarez de Sotomayor M. 2016. Diet supplementation with rice bran enzymatic extract restores endothelial impairment and wall remodelling of ApoE^(-/-) mice microvessels. *Atherosclerosis.* 50:15-22. (IF:4.239) Q1/T1/D2 Pheripheral Vascular Disease 10/63. SCOPUS (6), WOS (5).

C.1.6. Pérez-Ternero C, Bermudez B, Alvarez de Sotomayor M, Herrera MD. 2016. Atherosclerosis-related inflammation and oxidative stress are improved by rice bran enzymatic extract *Journal of Functional Foods* 26:610-621. (IF:3.144) Q1 Food Science & Technology 18/130. SCOPUS (7), WOS (6).

C.1.7. Justo ML, Claro C, Zeyda M, Stulnig TM, Herrera MD, Rodriguez-Rodriguez R. 2016. Rice bran prevents high-fat diet-induced inflammation and macrophage content in adipose tissue. *European Journal of Nutrition* 55(6):2011-9. (IF:4.370) Q1/T1/D2 Nutrition & Dietetics 14/81.

C.1.8. Claro C., Ogalla E., Rodriguez-Rodriguez R., Herrera M.D., Alvarez De Sotomayor M. 2015. Phenolic content of extra virgin olive oil is essential to restore endothelial dysfunction but not to prevent vascular inflammation in atherosclerotic lesions of Apo E deficient mice. *Journal of Functional Foods* 15: 126-136. (IF:3.973) Q1/T1/D1 Food Science & Technology 8/125. SCOPUS (5), WOS (7).

C.1.9. Ogalla E, Claro C, Herrera MD, Rodriguez-Rodriguez R. 2015. Structural, mechanical and myogenic properties of small mesenteric arteries from ApoE KO mice: characterization and effects of virgin olive oil diets. *Atherosclerosis.* 238:55-63. (IF:3.942) Q1/T1/D2 Pheripheral Vascular Disease 12/63. SCOPUS (7), WOS (7).

C.1.10. Justo ML, Claro C, Vila E, Herrera MD, Rodriguez-Rodriguez R. 2014. Microvascular disorders in obese Zucker rats are restored by a rice bran diet. *Nutr Metab Cardiovasc Dis.* 24(5):524-31. (IF:3.323) Q2/T1/D3 Nutrition & Dietetics 20/77. SCOPUS (20), WOS (15).

C.2. Congress

C.2.1. Selective cannabinoid nanoparticles for Atherosclerosis treatment. Lucía Martín-Navarro Díaz, Carmen María Claro-Cala, M^a Dolores Herrera-González, Josefa Álvarez-Fuentes, Lucía Martín-Banderas. NanoPortugal (NPTO2021) Online Conference, September 16-17, 2021. Oral contribution.

C.2.2. Cannabinoid delivery systems for the treatment of atherosclerosis. Lucía Martín-Navarro Díaz, Carmen María Claro-Cala, M^a Dolores Herrera-González, Josefa Álvarez-Fuentes, Lucía Martín-Banderas. NanoMedEurope 2021 (virtual conference), September 7-9, 2021. Poster contribution.

C.3. Research projects

C.3.1. **Project.** Nanotransportadores activos de cannabinoides para el tratamiento de la aterosclerosis (US-1263053).

Principal investigator: M^a Dolores Herrera Gonzalez y Lucia Martin Banderas (University of Seville)

Degree of contribution: Principal investigator

Funding entity: Programa Operativo FEDER Andalucía 2014-2020 (Concurrencia competitiva a proyectos de I+D+i)



Start-End date: 01/02/2020-30/04/2022

Total amount: 90.000 euros

C.3.2. **Project** Caracterización de las propiedades funcionales a nivel cardiovascular y del síndrome metabólico de un extracto enzimático del salvado de arroz (AGL2009-11559 (subprograma ALI)

Principal investigator: M^a Dolores Herrera Gonzalez (University of Seville)

Degree of contribution: Principal investigator

Funding entity: Ministerio de Ciencia e Innovación. Plan Nacional de I+D+i (2008-2011).

Programa: Investigación Fundamental. Subprograma: Proyecto de Investigación Fundamental no orientada.

Start-End date: 01/01/2010 - 31/12/2012

Total amount: 84.700 euros

C.3.3. **Project** Obtención y escalado a planta piloto de extractos enzimáticos procedentes de co-productos agroindustriales: caracterización de las propiedades funcionales a nivel cardiovascular y síndrome metabólico (TRA2009_0263_02)

Principal investigator: M^a Dolores Herrera Gonzalez (University of Seville)

Degree of contribution: Principal investigator

Funding entity: Ministerio de Ciencia e Innovación. Plan Nacional de I+D+i (2008-2011).

Proyecto de Investigación fundamental orientada a la Transmisión de Conocimiento a la Empresa (OPN-TRACE)

Start-End date: 01/03/2010 - 29/02/2012

Total amount: 60.500 euros

C.2.4. **Project** Investigación y desarrollo de nuevas posibilidades de aplicaciones terapéuticas en el aceite de oliva (IPT-060000-2010-028)

Principal investigator: M^a Dolores Herrera Gonzalez (University of Seville)

Degree of contribution: Principal investigator

Funding entity: Ministerio de Ciencia e Innovación D.G. de transferencia de tecnología y desarrollo empresarial. España

Program: Plan Nacional de Investigación, Desarrollo e Innovación Tecnológica (2008-2011). Subprograma INNPACTO.

Start-End date: 01/01/2010 - 31/12/2012

Total amount: 114.438 euros

C.2.5. **Project** El aceite de orujo de centrifugación como posible alimento funcional: estudios en animales de experimentación y humanos. (AGL-2002-00195)

Principal investigator: Valentina Ruiz Gutierrez (Instituto de la Grasa, CSIC, Seville).

Degree of contribution: Investigator

Funding entity: Ministerio de Ciencia y Tecnología. Plan Nacional de I+D+i.

Start-End date: 04/12/2002 - 04/12/2005

Total amount: 237.300 euros

C.4. Contracts, technological or transfer merits

C.4.1. **Contract**. CENIT PRONAOS. Investigación científica dirigida al desarrollo de una nueva generación de alimentos para el control de peso y prevención de la obesidad.

Principal investigator: María Alvarez de Sotomayor Paz (University of Seville).

Degree of contribution: Investigator

Funding entity: Neocodex S.L.

Start-End date: 18/01/2009 - 04/12/2012

Total amount: 57.141,6 euros

C.4.2. **Industrial and intellectual property, Patent of invention**. Inventors: Parrado Rubio J, Herrera González MD. Application number: P201300226. Patent number: ES2489296B1

Title registered industrial property: Procedimiento de obtención de extractos enzimáticos con actividad farmacológica a partir de orujo de uva. Date of register:01/09/2014.

Entity holder of rights: University of Seville (100%).