

CV Date

8/04/2025

Part A. PERSONAL INFORMATION

First Name	Jose Luis		
Family Name	Calvo Gallego		
Sex		Date of Birth	
ID number Social Security, Passport			
URL Web			
Email Address			
Open Researcher and Contributor ID (ORCID)	0000-0002-3407-1582		

A.1. Current position

Job Title	Profesor Titular de Universidad		
Starting date	2023		
Institution	Universidad de Sevilla		
Department / Centre	Ingeniería Mecánica y Fabricación / Escuela Técnica Superior de Ingeniería		
Country	Spain	Phone Number	
Keywords	Algorithms; Numeric methods, finite elements; Mechanical properties; Numerical simulation; Drug metabolism; Health		

A.3. Education

Degree/Master/PhD	University / Country	Year
Programa Oficial de Doctorado en Diseño Avanzado en Ingeniería Mecánica	Universidad de Sevilla	2017
Máster en Diseño Avanzado en Ingeniería Mecánica	Universidad de Sevilla	2012
Ingeniero Industrial Especialidad Mecánica de Máquinas	Universidad de Sevilla	2011

Part B. CV SUMMARY

Dr. Jose Luis Calvo Gallego was graduated from the University of Seville in Mechanical Engineering in 2011. During the last year of his degree, he received a grant from the Ministry of Education to research in the Mechanical and Manufacturing Engineering Department at University of Seville. His degree thesis, "Development of a methodologic test to verify the rod-valve screwed connection of a damper" was a research project in collaboration with the company BWI Poland. Afterwards, he joined the Civil Engineering Department in Abengoa, participating in several international projects. He mainly carried out calculations of structures and foundations. He was graduated with a Master in Science in Advance Design in Mechanical Engineering in 2012, being the first of the class. Later, he received a FPI grant from the Ministry of Economy and Competitiveness and obtained his Ph.D. (suma cum laude) in Mechanical Engineering in January 2017 from the Mechanical and Manufacturing Engineering Department at University of Seville. His dissertation titled 'Experimental characterization of breast tissues and its application to a numerical model of a healthy breast' explores the problem of experimental testing in human soft tissues, their mechanical properties characterization and the development of numerical models with this type of materials. The results derived from the thesis led to the publication of 5 articles in high quality journals. During his doctoral studies, he was visiting scholar at the institute of Biomechanics (Graz University of Technology) in 2014 with Professor Gerhard Holzapfel. At the end of his doctoral studies, he got a lecturer position in the University of Seville during several months. Afterwards, he joined the control systems division at Fundación Ayesa in May 2017. He was in charge of the "Manufacturing and cost optimization for market implementation" work package in the H2020 INN-BALANCE

project, which aim was to improve the costs of an automotive fuel cell system with a consortium consisting of the following companies: Volvo, Brose, AVL, DLR, Powercell, Celeroton and Ayesa. He also led managing tasks as coordinator partner of the project. Moreover, he collaborated in the preparation of several H2020 proposals and worked in other H2020 projects such as HEAVEN, which aim is the development of a high efficient fuel cell-based serial-hybridelectric propulsion architecture combined with a cryogenic hydrogen storage for aviation with a consortium consisting of the following companies: Air Liquide, DLR, Elrinklinger, Pipistrel, H2FLY and Ayesa. In February 2019, he obtained an assistant professor position in the Mechanical and Manufacturing Engineering Department at University of Seville, where he is currently developing his teaching and researching activities. In 2023 he obtained his civil servant position as associate professor. Since his return to the university, he has focused his research on biomechanics and bone mechanobiology. In particular, he is dedicated to bone remodelling, focusing on the development of mathematical models to simulate osteoporosis and its treatments, both at representative volume element and finite element levels. Its aim is to shed light on a disease with a huge social and economic impact, with the intention of improving the quality of life of women suffering from this disease. His research work is supported by 17 papers in high quality peer-reviewed international journals and 23 contributions to national and international congresses. He has participated in 6 national projects and 2 international H2020 projects funded by public institutions and companies. As a result of his activities, he has had a very fruitful research relationship for many years with Professor Peter Pivonka (and collaborators) from the Queensland University of Technology in Brisbane, Australia. He has recently started collaborating with the prestigious Professor Ralph Müller, from ETH Zurich and other researchers in Argentina and France. He has 11 publications with foreign researchers and 5 with medical or biological co-authors, which highlights his international and multidisciplinary character and the potential application of his research in the medical field to which he tries to contribute from engineering. He has also supervised a thesis, is currently supervising two more and is a reviewer for several prestigious international journals. He has been PI of 2 teaching innovation projects at the University of Seville. In all his positions, both in the private sector and in the University, he has stood out for his hard-working and proactive character, taking on responsibilities and leading tasks.

Part C. RELEVANT ACCOMPLISHMENTS

C.1. Most important publications in national or international peer-reviewed journals, books and conferences

AC: corresponding author. (n° x / n° y): position / total authors. If applicable, indicate the number of citations

- 1 **Scientific paper.** Rocío Ruiz Lozano; (2/5) Jose Luis Calvo Gallego; Peter Pivonka; Michelle McDonald; Javier Martínez Reina. 2024. An in silico approach to elucidate the pathways leading to primary osteoporosis: age-related vs. postmenopausal. Biomechanics and Modeling in Mechanobiology. Springer. 23-4, pp.1393-1409. WOS (0), SCOPUS (0) <https://doi.org/10.1007/s10237-024-01846-2>
- 2 **Scientific paper.** (1/4) Calvo-Gallego, José Luis (AC); Manchado-Morales, Pablo; Pivonka, Peter; Martínez-Reina, Javier. 2023. Spatio-temporal simulations of bone remodelling using a bone cell population model based on cell availability. Frontiers in Bioengineering and Biotechnology. Frontiers Research Foundation. 11. ISSN 2296-4185. WOS (4), SCOPUS (4) <https://doi.org/10.3389/fbioe.2023.1060158>
- 3 **Scientific paper.** Martínez-Reina, Javier; (2/4) Calvo-Gallego, José Luis; Martin, Madge; Pivonka, Peter. 2022. Assessment of strategies for safe drug discontinuation and transition of denosumab treatment in PMO—Insights from a mechanistic PK/PD model of bone turnover. Frontiers in Bioengineering and Biotechnology. Frontiers Research Foundation. 10. ISSN 2296-4185. WOS (6), SCOPUS (5) <https://doi.org/10.3389/fbioe.2022.886579>

- 4 **Scientific paper.** (1/4) Calvo-Gallego, José Luis (AC); Pivonka, Peter; Ruiz-Lozano, Rocío; Martínez-Reina, Javier. 2022. Mechanistic PK-PD model of alendronate treatment of postmenopausal osteoporosis predicts bone site-specific response. *Frontiers in Bioengineering and Biotechnology*. Frontiers Research Foundation. 10. ISSN 2296-4185. WOS (5), SCOPUS (5) <https://doi.org/10.3389/fbioe.2022.940620>
- 5 **Scientific paper.** (1/4) Calvo-Gallego, José Luis (AC); Pivonka, Peter; García-Aznar, José Manuel; Martínez-Reina, Javier. 2021. A novel algorithm to resolve lack of convergence and checkerboard instability in bone adaptation simulations using non-local averaging. *International Journal for Numerical Methods in Biomedical Engineering*. WILEY-BLACKWELL. 37-2. ISSN 2040-7947. WOS (10), SCOPUS (10) <https://doi.org/10.1002/cnm.3419>
- 6 **Scientific paper.** Martínez-Reina, Javier; (2/3) Calvo-Gallego, José Luis; Pivonka, Peter. 2021. Are drug holidays a safe option in treatment of osteoporosis? — Insights from an in silico mechanistic PK–PD model of denosumab treatment of postmenopausal osteoporosis. *Journal of the Mechanical Behavior of Biomedical Materials*. ELSEVIER SCIENCE BV. 113. ISSN 1878-0180. WOS (11), SCOPUS (11) <https://doi.org/10.1016/j.jmbbm.2020.104140>
- 7 **Scientific paper.** Martínez-Reina, Javier; (2/3) Calvo-Gallego, José Luis; Pivonka, Peter. 2021. Combined effects of exercise and denosumab treatment on local failure in post-menopausal osteoporosis—insights from bone remodelling simulations accounting for mineralisation and damage. *Frontiers in Bioengineering and Biotechnology*. Frontiers Research Foundation. 9. ISSN 2296-4185. WOS (13), SCOPUS (12) <https://doi.org/10.3389/fbioe.2021.635056>
- 8 **Scientific paper.** (1/5) Calvo-Gallego, Jose Luis (AC); Domínguez, Jaime; Gómez Cía, Tomás; Gómez Ciriza, Gorka; Martínez-Reina, Javier. 2018. Comparison of different constitutive models to characterize the viscoelastic properties of human abdominal adipose tissue. A pilot study. *Journal of the Mechanical Behavior of Biomedical Materials*. ELSEVIER SCIENCE BV. 80, pp.293-302. ISSN 1878-0180. WOS (29), SCOPUS (32) <https://doi.org/10.1016/j.jmbbm.2018.02.013>
- 9 **Scientific paper.** (1/5) Calvo-Gallego, Jose Luis (AC); Commisso, Maria Soledad; Domínguez, Jaime; Tanaka, Eiji; Martínez-Reina, Javier. 2017. Effect of freezing storage time on the elastic and viscous properties of the porcine TMJ disc. *Journal of the Mechanical Behavior of Biomedical Materials*. ELSEVIER SCIENCE BV. 71, pp.314-319. ISSN 1878-0180. WOS (9), SCOPUS (10) <https://doi.org/10.1016/j.jmbbm.2017.03.035>
- 10 **Bibliographic review.** Peter Pivonka; (2/4) Jose Luis Calvo Gallego; Stephan Schmidt; Javier Martínez Reina. 2024. Advances in mechanobiological pharmacokinetic-pharmacodynamic models of osteoporosis treatment—Pathways to optimise and exploit existing therapies. *Bone*. Elsevier. 186, pp.117140. WOS (2), SCOPUS (2) <https://doi.org/10.1016/j.bone.2024.117140>

C.2. Conferences and meetings

- 1 Ruiz-Lozano, Rocío; Calvo-Gallego, José Luis; Pivonka, Peter; Martínez-Reina, Javier. Estudio in-silico de combinación de tratamientos para la osteoporosis postmenopáusica. XXIV Congreso Nacional de Ingeniería Mecánica. Las Palmas de Gran Canaria, Spain. 2023. Participatory - oral communication. Conference.
- 2 Ruiz-Lozano, Rocío; Calvo-Gallego, José Luis; Pivonka, Peter; Martínez-Reina, Javier. In-silico approach to elucidate the pathways leading to primary osteoporosis: age-related vs. postmenopausal. 28th Congress of the European Society of Biomechanics. Maastricht, Netherlands. 2023. Participatory - oral communication. Conference.
- 3 Martínez-Reina, Javier; Calvo-Gallego, José Luis; Gutiérrez-Millán, Fernando; Pivonka, Peter. A mechanobiological bone remodelling model coupling bone physiology and systemic calcium and phosphorus homeostasis. X International Conference of Computational Methods for Coupled Problems in Science and Engineering. Crete, Greece. 2023. Participatory - oral communication. Conference.

- 4 Pandelani, Thanyani; Ngwangwa, Harry; Nemavhola, Fulufhelo; Calvo-Gallego, José Luis. Characterization of viscoelasticity of human buttocks gluteal muscles. 9th World Congress of Biomechanics. Taipei, Taiwan. 2022. Participatory - oral communication. Conference.
- 5 Ruiz-Lozano, Rocío; Calvo-Gallego, José Luis; Pivonka, Peter; Martínez-Reina, Javier. A PK-PD model of alendronate for the treatment of postmenopausal osteoporosis. 27th Congress of the European Society of Biomechanics. Porto, Portugal. 2022. 'Participatory - poster. Conference.
- 6 Calvo-Gallego, José Luis; Manchado-Morales, Pablo; Pivonka, Peter; Martínez-Reina, Javier. A bone cell population model describing intermittent activation of bms based on cell availability. 27th Congress of the European Society of Biomechanics. Porto, Portugal. 2022. 'Participatory - poster. Conference.
- 7 Calvo-Gallego, José Luis; Ojeda, Joaquín; Pivonka, Peter; Martínez-Reina, Javier. Homeostasis en la Teoría del Mecanostato y su aplicación en el desarrollo de un algoritmo de remodelación ósea. X Reunión del Capítulo Español de la Sociedad Europea de Biomecánica (ESB). Las Palmas de Gran Canaria, Spain. 2019. Participatory - oral communication. Conference.
- 8 Martínez-Reina, Javier; Calvo-Gallego, José Luis; Pivonka, Peter. ¿Son convenientes las interrupciones de los tratamientos antirreabsortivos? Una visión del problema desde un punto de vista in-silico. IX Reunión del Capítulo Español de la Sociedad Europea de Biomecánica (ESB). Las Palmas de Gran Canaria, Spain. 2019. Participatory - oral communication. Conference.
- 9 Calvo-Gallego, José Luis; Domínguez, Jaime; Martínez-Reina, Javier. Characterization and comparison of the mechanical behaviour of human adipose tissue in different anatomical regions. VI Reunión del capítulo español de la Sociedad Europea de Biomecánica. Badajoz, Spain. 2016. Participatory - oral communication. Conference.
- 10 Calvo-Gallego, José Luis; Domínguez, Jaime; Holzapfel, Gerhard. Influence of Periadventitial Tissues on the Mechanics of the Thoracic Aorta. 9TH European Solid Mechanics Conference. Madrid, Spain. 2015. Participatory - oral communication. Conference.

C.3. Research projects and contracts

- 1 **Project.** PID2019-106969RB-I00, Modelos de Remodelación Ósea y su Aplicación para Simular el Efecto de Tratamientos Antireabsortivos contra la Osteoporosis Postmenopáusica. Ministerio de Ciencia, Innovación y Universidades. Martínez Reina, Javier. (Universidad de Sevilla). 01/06/2020-31/05/2024. 67.276 €. Team member.
- 2 **Project.** P18-RT-3611, Efecto combinado del ejercicio físico y el denosumab en el tratamiento de la osteoporosis. Diseño de un tratamiento farmacológico específico de paciente. Junta de Andalucía (Consejería de Economía y Conocimiento). Martínez Reina, Javier. (Universidad de Sevilla). 01/01/2020-31/12/2022. 117.218 €. Team member.
- 3 **Project.** 826247 (H2020-JTI-FCH-2018-01), High power density FC system for aerial passenger vehicle fueled by liquid hydrogen. Comisión Europea. Alicia Arce Rubio. (Aguas y Estructuras, S.A.). 01/01/2019-31/12/2022. 4.600.881 €. Team member.
- 4 **Project.** 735969 (H2020-JTI-FCH-2016-01), Innovative cost improvements for balance of plant components of automotive PEMFC systems. Comisión Europea. Alicia Arce Rubio. (Aguas y Estructuras, S.A.). 01/01/2017-31/12/2019. 6.156.288 €. Team member.
- 5 **Project.** DPI2014-58233-P, Modelos de Comportamiento del Tejido Óseo Inmaduro en el Callo de Distracción Ósea. Ministerio de Economía y Competitividad. Martínez Reina, Javier. (Universidad de Sevilla). 01/01/2015-31/12/2018. 169.400 €. Team member.
- 6 **Project.** DPI2011-28080, Modelado Numérico de un Proceso de Reconstrucción Mamaria. Ministerio de Economía y Competitividad. Domínguez Abascal, Jaime. (Universidad de Sevilla). 01/01/2012-31/12/2014. 124.630 €. Team member.