

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	Begoña		
Family name	Calvo Calzada		
Gender (*)	Female	Birth date (dd/mm/yyyy)	04/04/1963
Social Security, Passport, ID number	13109598N		
e-mail	bcalvo@unizar.es	URL Web	https://i3a.unizar.es/es/investigadores/begona-calvo-calzada
Open Researcher and Contributor ID (ORCID)	0000-0001-9713-1813		

A.1. Current position

Position	Full Professor		
Initial date	2010		
Institution	University of Zaragoza		
Department/Center	Department of Mechanical Engineering.School on Engineering and Architecture		
Country	Spain	Teleph. number	+34606536757
Key words	Behavior of soft biological tissues. Muscle behavior. Ocular system. Hyperelastic models. Advanced computational methods. Non-linear solid mechanics.		

A.2. Previous positions (research activity interruptions, indicate total months)

Period	Position/Institution/Country/Interruption cause
1996 - 2010	Associate Professor
1990 - 1995	Assintant Professor

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
PhD in Computational Mechanics	University of Zaragoza	1994
BEng and MEng Mechanical Engineering	University of Zaragoza	1989

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

Begoña Calvo currently holds the position of Full Professor of Structural Mechanics in the Department of Mechanical Engineering at UNIZAR since 2010. She obtained her Ph.D. in Computational Mechanics from the University of Zaragoza in 2004 and worked as a visiting scholar at the University of Porto (PT).

Professor Calvo has authored over 120 papers in ISI journals, 250 conference proceedings, various book chapters, reports, and oral presentations. He has led numerous research projects, facilitated knowledge transfer to the industry, and successfully supervised fifteen PhD theses. Currently, she is the Coordinator of the Applied Mechanics and Bioengineering Group (T24-23R) under the Aragon

Government (<http://amb.unizar.es/>). While also contributing to various national and European commissions associated with research. Furthermore, she is an active member of numerous national and international scientific associations.

Professor Calvo has led the coordination of various research topics in the field of bioengineering, showcasing expertise in computational mechanics with a particular focus on numerical modeling of soft biological tissues, including muscles and eye tissues. Her research extends to areas such as soft tissue modeling, inelastic effects of biological tissues, ocular and abdominal diseases, and their interactions with medical devices. In the past year, she directed her research efforts toward experimental methods in biomechanics. More recently she is working together with the BSH group on the development of digital twins for cooking assistance.

Her teaching responsibilities encompass subjects such as Continuum Mechanics, Strength of Materials, Structural Mechanics, and Advanced Numerical Methods, primarily emphasizing the characterization and simulation of complex materials and processes. Beyond her academic and research roles, Professor Calvo has contributed to research management in various capacities. This includes serving as a member of the evaluation committee for the Basque Government's Pre-doctoral and Post-doctoral Grants Programme and being part of the committee of experts for the Ramón y Cajal and Juan de la Cierva Programme in the Area of Naval Mechanical and Aeronautical Engineering within the Directorate General for Research and Management of the National R&D&I Plan under the Ministry of Economy and Competitiveness.

Part C. RELEVANT MERITS (*Years from 2014 to 2023*)

C.1. Publications (*10 publications: 2014-2023*)

1. I Cabeza-Gil; I. Ríos-Ruiz; M. A. Martínez; B. Calvo; J Grasa. Digital twins for monitoring and predicting the cooking of food products: A case study for a French crêpe. *Journal of Food Engineering*. 2023-08. FI: 5.7, (Q1: 30/ 142 Food Science)
2. M. Karami, H. Zohoor, B. Calvo, J. Grasa. A 3D multi-scale skeletal muscle model to predict active and passive responses. Application to intra-abdominal pressure prediction. *Computer Methods in Applied Mechanics and Engineering*. 415, pp. 116222 [23 pp.]. 2023.. FI: 7.2, (Q1: 7/ 80 Engineering Multidisciplinary)
3. I. Cabeza-Gil, B. Calvo, J. Grasa, C Franco, S. Llorente, M.A. Martínez. Thermal analysis of a cooking pan with a power control induction system. *Applied Thermal Engineering*, vol 180, 115789, 2020. FI: 5.295 (Q1: 14/ 133 Engineering Mechanical)
4. S. Lorente-Bailo, I. Etayo, M. Salvador, A. Ferrer-Mairal, MA. Martínez, B. Calvo, J. Grasa. Modeling domestic pancake cooking incorporating the rheological properties of the batter. Application to seven batter recipes. *Journal of Food Engineering*, vol 291, 110261, 2021(Q1: 30/ 142 Food Science)
5. J. Moya, S. Lorente-Bailo, M. Salvador, A. Ferrer-Mairal, MA. Martínez, B. Calvo, J. Grasa. Development and validation of a computational model for steak double-sided pan cooking. *Journal of Food Engineering*, vol 298, 110498, 2021. (FI: 6.203, Q1: 29/ 142 Food Science)
6. J. Moya, S. Lorente-Bailo, A. Ferrer-Mairal, MA. Martínez, B. Calvo, J. Grasa, M. Salvador. Color changes in beef meat during pan cooking: kinetics, modeling and application to predict turnover time. *European Food Research and Technology*, 247, pp: 2751–2764, 2021. (FI:3.498 Q2: 64/ 144 Food Science)
7. M. A. Ariza-Gracia, A. Orillés, J. A. Cristóbal, José F. Rodríguez, B. Calvo A numerical-experimental protocol to characterize corneal tissue with an application to predict astigmatic keratotomy surgery. *Journal of the Mechanical Behavior of*

- Biomedical Materials, Journal of the Mechanical Behavior of Biomedical Materials, 74, 2, Pages 304-314, 2017. FI: 3.239, (Q1: 18/78 Engineering, Biomedical).
8. M. A. Ariza-Gracia, S. Redondo, David P. Piñero, B. Calvo, José F. Rodríguez. A predictive tool for determining patient specific mechanical properties of human corneal tissue. Computer Methods in Applied Mechanics and Engineering, 317, pp. 226 - 24, 2017. FI: 4.441, (Q1: 5/85) Engineering, Multidisciplinary).
 9. MA. Ariza-Gracia, J. Zurita, David P. Piñero, B. Calvo, JF. Rodríguez. Automatized Patient-Specific Methodology for Numerical Determination of Biomechanical Corneal Response. Annals of Biomedical Engineering, 44(5), pp: 1753-72, 2016. FI: 3.221 (Q1: 18/77) Engineering, Biomedical.

C.2. Congress

1. Fantaci B., Calvo B., Grasa J.; Ariza-Gracia, M. A. Does corneal stiffness play a role in post-surgical corneal ectasia? 27th Congress of the European Society of Biomechanics. Porto, Portugal. 26-29/06/2022. Oral presentation
2. I. Cabeza-Gil, M. Ruggeri, Y.C. Chang, B. Calvo, F. Manns. 2022 Annual Meeting. Association for Research in Vision and Ophthalmology (ARVO). 2022, Denver (US). Quantification of ciliary muscle movement during accommodation from transscleral OCT images. Oral presentation.
3. P. Martins, A. Pérez-Ruíz, G. Abizanda, B. Calvo, J. Grasa. Experimental and numerical characterization of the active behavior of mouse rotator cuff muscles. 27th Congress of the European Society of Biomechanics. Porto, Portugal, 26/06/2022. Póster.

C.3. Research projects, indicating your personal contribution.

1. Electrodomésticos hiper sostenibles y con alto impacto en la experiencia culinaria (HIPATIA). BSH ELECTRODOMESTICOS ESPAÑA, S.A.; MINISTERIO DE CIENCIA E INNOVACION. IP_AMB: J. Grasa. (Escuela de Ingeniería y Arquitectura - Universidad de Zaragoza). 01/09/2022-31/08/2025. 141.853 €.
2. PID2020-113822RB-C21: Evaluación mecánica de la regeneración tendinomuscular y aplicación de gemelos digitales. Escuela de Ingeniería y Arquitectura - Universidad de Zaragoza. IP, Co-IP: J. Grasa; B. Calvo. AGENCIA ESTATAL DE INVESTIGACIÓN. From: 01/09/2021 to 31/08/2024. 181.500 €
3. OBERON/ Opto-Biomechanical Eye Research Network (G.A. No. 956720). Unión Europea. From: 01/01/2021 - 31/12/2024. PI UZ: B. Calvo. UZ: 501.809,76 €.
4. Nuevas tecnologías de calentamiento y control aplicado a electrodomésticos para mejorar la experiencia de usuario (ARQUE)-GRUPO AMB. RTC-2017-5965-6. PI: MA. Martínez. MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD. From: 01/04/2018 - 30/09/2021. 131.463,41 €
5. Modelado personalizado in-sílico del globo ocular. Ayuda al diseño y planificación de tratamientos oftalmológicos. MINECO. DPI2017-84047-R. From: 01/01/2018 to: 31/12/2021. PI: B. Calvo and J. Grasa. 121.000 €
6. Respuesta del tejido corneal al tratamiento del cross-linking. Aplicación al tratamiento del queratocono. CICYT. DPI2014-54981R. From: 01/01/2015 to: 31/12/2017. PI: B. Calvo and J. Grasa. 130.000 €
7. FP7-SME-2013-606634-POPCORN. Development of corneal biomechanical model. Dynamic topographical characterization based on 3D plenoptic imaging. PI: D. Piñero. Unión Europea. From: 01/09/2013 to: 30/03/2016. 1000000 €, PI UZ: B. Calvo UZ: 216.000 €.

C.4. Contracts, technological or transfer merits.

1. UNIDIGITAL. Artificial Intelligence and Cognitive Autonomous Systems. IPS: Begoña Calvo; Itziar Ríos; Iulen Cabeza. Company: MINISTERIO DE UNIVERSIDADES. From: 08/03/2023 Time: 3 months. 3.000 €
2. Application of artificial intelligence techniques to food cooking. Company: BSH Electrodomésticos. From: 01/03/2022, to: 28/02/2024. PI: Begoña Calvo. 72.600 €
3. Numerical Simulation of Food Cooking and Preservation. (IP, Co-IP,...): Jorge Grasa. BSH ELECTRODOMESTICOS ESPAÑA, S.A. From: 01/06/2021 to 30/12/2021. 12.000 €
4. IOL FE ANALYSIS. Internacional. PI: María Begoña Calvo. Company: CARL ZEISS MEDITEC AG. From: 08/01/2020, to: 08/04/2020. 9.000 €
5. Numerical simulation of induction cooking. Company: BSH Electrodomésticos. From 01/10/2020 to: 01/10/2021. IP: Begoña Calvo. 52.656,86 €
6. Advances in the design of smart pots for induction cooking. Company: BSH Electrodomésticos. From: 01/07/2016, to: 01/07/2018. PI: Begoña Calvo. 35.376€
7. Numerical-experimental analysis of the deformations in vessels on induction plates. BSH Electrodomésticos. From: 20/05/2015, to: 20/05/2016. PI: Begoña Calvo. 35.376,81 €
8. D. P. Piñero, Á. Tolosa, N. Alcon, M. A. Ariza, J. F. Rodríguez, B. Calvo. Sistema de caracterización 3D de la respuesta mecánica del tejido de la córnea y procedimiento de medida con dicho sistema. P201431731. España, date: 03/03/2015. Entidad Titular: Alicante Oftalmológica S. L. Explotación: OFTALMAR

C.5. PhD Advised

1. Bayesian Sequential Non-Rigid Structure From Motion. Antonio Agudo Martínez. Co- advised: José María Martínez Montiel. 8/05/2015.
2. Towards the in vivo mechanical characterization of abdominal wall in an animal model. Application to the mesh hernia repair. Raquel Simón Allué. Co-advised: José María Martínez Montiel. 15/12/2016
3. Skeletal muscle fatigue, a mechanical characterization approach. Development of animal and computational models. Marta Sierra. Co- adviseds: Javier Miana Mena y Jorge Grasa. 31/03/2017.
4. Corneal Collagen Crosslinking: Development of New In Vivo Methods for the Mechanical Characterization and Assessment as Treatment of Acanthamoeba Keratitis. Ángel L. Orillés Gonzalo- Co- advised: José Ángel Cristóbal Bescós. 23/05/2017.
5. Methods for Characterising Patient-Specific Corneal Biomechanics. Miguel Ángel Ariza Gracia. Co-advised: José Félix Rodríguez Matas. 08/09/2017.
6. Computational planning tools in ophthalmology: Intrastromal corneal ring surgery. Julio Flecha. Co-advised: Miguel Ángel Ariza Gracia. 17/03/2021
7. A Numerical Exploration of the Crystalline Lens: from Presbyopia to Cataracts and Intraocular Lenses. Iulen Cabeza Gil. Universidad de Zaragoza. 24/06/2022
8. Computational Techniques To Simulate Food Processing And Safety. Application To Domestic Meat Cooking. Jara María Moya Pérez. Co-advised: Jorge Grasa. 14/09/2022