



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 07/12/2021

First name	JOSÉ ANTONIO		
Family name	SANZ HERRERA		
Gender (*)		Birth date (dd/mm/yyyy)	
Social Security, Passport, ID number			
e-mail	j	URL Web	
Open Researcher and Contributor ID (ORCID) (*)			

(*) Mandatory

A.1. Current position

Position	Full Professor (Catedrático de Universidad)		
Initial date	21/07/2021		
Institution	Universidad de Sevilla		
Department/Center	Mecánica de Medios Continuos y Teoría de Estructuras	Escuela Técnica Superior de Ingeniería	
Country	Spain	Teleph. number	
Key words	Ingeniería mecánica, aeronáutica y naval; Ingeniería civil y arquitectura		

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

Period	Position/Institution/Country/Interruption cause
05/12/2017 – 20/07/2021	Profesor Titular / Universidad de Sevilla / Spain
02/12/2010 – 04/12/2017	Profesor Contratado Dr / Universidad de Sevilla / Spain
10/06/2009 – 01/12/2010	Profesor Ayudante Dr / Universidad de Sevilla / Spain
10/06/2008 – 09/06/2009	Profesor Ayudante / Universidad de Sevilla / Spain

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Doctor Ingeniería Biomédica	Universidad de Zaragoza	2008
Ingeniería Industrial	Universidad de Sevilla	2004

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

My research is dedicated to the mathematical modeling and computational simulation of biophysical phenomena and clinical applications at different scales in the field of biomechanics and mechanobiology, modeling and computational simulation of biomaterials, computational mechanics and development of numerical methods in engineering. Along my career I have published 42 JCR research papers, in which 27 are Q1 ranked. My research is regularly published in international journals, including 3 papers in leading journals of their category (impact factor higher than 7). Moreover, I have accumulated more than 1500 citations according to Google Scholar (h-index = 19). My research have been funded both at national level (plan nacional de investigación) and regional level (Junta de Andalucía). In particular, I



have participated as a PI in 4 research projects. I have obtained 2 research periods (sexenios de investigación).

Since 2008 I develop an independent and novel research at the School of Engineering of the University of Seville. In particular, my research is classified within the Health and demographic change challenge, and is dedicated to unravel and decipher the role of mechanics in Biology, with an emphasis on analyzing this effect in relevant diseases such as cancer. Indeed, 2 of the last research projects that I led are dedicated to study cancer disease from a completely novel perspective and methodology. I expect that the results we are obtaining in our investigations could potentially benefit the global world health through new treatments, drugs and protocols. Along my career, I have been distinguished with several prizes as the young research Juan Carlos Simo 2013 or the Royal Academy of Sciences of Seville young investigator prize in 2011, amongst others.

Besides the research that I conduct in my group, I have a network of international collaborators. Specifically, I have worked in some prestigious universities such as École Polytechnique (France), MIT (Cambridge MA, USA), Imperial College London (London) and KU Leuven (Belgium). Moreover, in 2011 I earned a visiting professorship position at the University of Colorado at Boulder, dedicated to teach summer courses in the area of Cellular Mechanics.

I have transferred some of my research results to industry and society. In the period 2013-2016 I joined to the research department of structural mechanics of the company Abengoa Research S.L. where I was the responsible of that division (+1M EUR Budget Responsible, +20 Employers under my supervision). Moreover, I have signed I+D+i contracts as a PI with 4 private companies. I won two prizes for best business ideas in the University of Seville. I have obtained 1 transfer period (sexenio de transferencia).

I have supervised 1 doctoral thesis, 3 ongoing doctoral thesis (1 co-supervised with prof. Van Oosterwyck from KU Leuven), and 14 master thesis. Moreover, I have participated in a number of divulgation activities of my research: I have participated in the “Youngs with researchers” programs of the University of Seville, that promotes research and STEM careers among High School students. I have also been the director of summer courses since 2019 at the international University of Andalusia. These courses pursue to bring biomedical engineering studies closer to society, including university students and professionals of different fields of medicine and engineering.

I have edited 1 special issue in a JCR journal and edited 1 book. I have reviewed papers in more than 30 JCR journals. I also regularly review research projects for national (AEI, DKV) and international agencies (CNRS-France, FWO-Belgium). I'm an editorial member of 3 international JCR journals.

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

C.1. Publications (*see instructions*)

JCR Publication. Barrasa-Fano, J; Shapeti, A; De Jong, J; Ranga, A; **Sanz-Herrera, JA***; Van Oosterwyck H* (*Joint senior authorship). Advanced in silico validation framework for three-dimensional Traction Force Microscopy and application to an in vitro model of sprouting angiogenesis. *Acta Biomaterialia* 2021, 126, 326-338. IF: 7.242. 8/87 ENGINEERING, BIOMEDICAL.

JCR Publication. **Sanz-Herrera, JA**; Barrasa-Fano J; Córdor, M; Van Oosterwyck, H. 2021. Inverse method based on 3D nonlinear physically constrained minimisation in the framework of traction force microscopy. *Soft Matter* 2021, 17, 10210-10222. IF: 3.140. 22/89 POLYMER SCIENCE.

JCR Publication. **Sanz-Herrera, JA**; Mora-Macías, J; Ayensa-Jiménez, J; Reina-Romo, E; Doweidar, MH; Domínguez, J; Doblaré, M. Data-Driven Computational Simulation in Bone Mechanics. *Annals of Biomedical Engineering* 2021, 49 (1), 407-419. IF: 3.324. 30/87 ENGINEERING, BIOMEDICAL.



JCR Publication. Ayensa-Jiménez, J; Pérez-Aliacar, M; Randelovic, T; Oliván, S; Fernández, L; **Sanz-Herrera, JA**; Ochoa, I; Doweidar, MH; Doblaré, M. Mathematical formulation and parametric analysis of in vitro cell models in microfluidic devices: application to different stages of glioblastoma evolution. Scientific Reports 2020, 10, 1-21. IF: 4.380. 17/72 SCIENCES, MULTIDISCIPLINARY.

JCR Publication. Mora-Macias, J; Ayensa-Jiménez, J; Reina-Romo, E; Doweidar, MH; Domínguez, J; M Doblaré; **Sanz-Herrera, JA**. A multiscale data-driven approach for bone tissue biomechanics. Computer Methods in Applied Mechanics and Engineering 2020, 368: 113-136. IF: 5.763. 6/91 ENGINEERING, MULTIDISCIPLINARY.

JCR Publication. Ayensa-Jiménez, J; Doweidar, MH; **Sanz-Herrera, JA**; M Doblaré, M. An unsupervised data completion method for physically-based data-driven models. Computer Methods in Applied Mechanics and Engineering 2019, 344: 120-143. IF: 4.821. 6/88 ENGINEERING, MULTIDISCIPLINARY.

JCR Publication. **Sanz-Herrera, JA**; Aliko-Benitez, A; AM Fadrique-Contreras, A.M. Numerical investigation of the coupled mechanical behavior of self-healing materials under cyclic loading. International Journal of Solids and Structures 2018, 160: 232-246. IF: 2.787. 34/134 MECHANICS.

JCR Publication. **Sanz-Herrera, JA**; Soria, L; Reina-Romo, E; Torres, Y; Boccaccini, AR. Model of dissolution in the framework of tissue engineering and drug delivery. Biomechanics and Modeling in Mechanobiology 2018, 17: 1331-1341. IF: 2.829. 28/80 ENGINEERING, BIOMEDICAL.

JCR Publication. **Sanz-Herrera, JA**; Reina-Romo, E; Boccaccini, AR. In silico design of magnesium implants: Macroscopic modeling. Journal of the mechanical behavior of biomedical materials 2018, 79: 181-188. IF: 3.485. 18/80 ENGINEERING, BIOMEDICAL.

JCR Publication. Ayensa-Jiménez, J; Doweidar, MH.; **Sanz-Herrera, JA**; Doblaré, M. A new reliability-based data-driven approach for noisy experimental data with physical constraints. Computer Methods in Applied Mechanics and Engineering 2018, 328: 752-774. IF: 4.821. 6/88 ENGINEERING, MULTIDISCIPLINARY.

C.2. Congress

A. Carrasco-Mantis, H. Castro-Abril, T. Randelovic, I. Ochoa, M. Doblaré, **J. A. Sanz-Herrera**. Multiphysics modeling of tumoral spheroid evolution. 17th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering. Bonn 2021 (online format).

17th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering. Chair of the session “Mathematical modelling and simulation of tumours”. Bonn 2021 (online format).

J. Barrasa-Fano, **J.A. Sanz-Herrera**, A. Shapeti, E. Faurobert, H. Van Oosterwyck. Novel and accesible 3D Traction Force Microscopy applied to an in vitro vascular disease model. European Society of Biomechanics (ESB). Milán (Italia). Online. 2020. Best student award.

J.A. Sanz-Herrera, J. Barrasa-Fano, A. Shapeti, M.M. Vaeyens, H. Van Oosterwyck. Physics-based 3D nonlinear inverse method to improve the resolving power of traction force microscopy. 8TH Biennial European Cell Mechanics Meeting. Milán (Italia). 2019.

ESB2017. European Society of Biomechanics. Sevilla 2017. Co-chair.

J.A. Sanz-Herrera. Investigación multidisciplinar como base del profesor universitario joven en Ingeniería (conferencia inaugural). VI Jornada de jóvenes investigadores del I3A. Zaragoza. 2017.



IUTAM Symposium on Micromechanics of Defects in Solids. Sevilla 2014. Local organising committee.

A. Aliko, **J.A. Sanz-Herrera**. Modelado químico-difusivo del fenómeno de la autorreparación en materiales estructurales. Métodos Numéricos en Ingeniería. Sociedad Española de Métodos Numéricos en Ingeniería (SEMNI), Asociación Portuguesa de Mecánica Teórica, Aplicada y Computacional (APMTAC). Bilbao (España). 2013.

II Reunión del Capítulo Español de la Sociedad Europea de Biomecánica. Sevilla 2012. Chair.

5th International Symposium on Defect and Material Mechanics. Sevilla 2011. Local organising committee.

C.3. Research projects

Modelización Computacional del Microentorno Celular con Aplicación a la Evolución de Tumores. Junta de Andalucía (Consejería de Conocimiento, Investigación y Universidad). Sanz-Herrera, JA. 2020-2023. 76000 EUR. **Principal Investigator**.

PGC2018-097257-B-C31. Caracterización in Vitro y Simulación in Vitro/in Vivo del Efecto de la Hipoxia y la Dosis Farmacológica en el Crecimiento del Glioblastoma. Ministerio de Economía y Competitividad. Sanz-Herrera, JA; Doblaré Castellano, M. 2019-2021. 128381 EUR. **Principal Investigator**.

US-1261691. Ingeniería de Tejidos para la Corrección de grandes Defectos Óseos: Modelado in Silico e in Vivo. Junta de Andalucía (Consejería de Economía y Conocimiento). Sanz-Herrera, JA; Reina Romo, E. 2020-2021. 87200 EUR. **Principal Investigator**.

DPI2010-20399-C04-02. Diseño, Construcción y Validación de Plataforma Biomimética para la Evaluación y Optimización de Constructos de Ingeniería Tisular para Reparación de Cartílago Articular. Ministerio de Economía y Competitividad. Sanz-Herrera, JA. 2011-2013. 42350 EUR. **Principal Investigator**.

P09-TEP-4493. Aplicación de modelos rápidos de dinámica de dislocaciones al estudio del grafeno y nanotubos de carbono. Consejería de Innovación, Ciencia y Empresa (Junta de Andalucía). Ariza Moreno, Pilar (Universidad de Sevilla). 2010-2013. **Research Team**.

C.4. Contracts, technological or transfer merits

Análisis avanzado en mecánica estructural. Atlantica Yield PLC. **IP: Sanz-Herrera, JA**. 2018-2020. 37 982,80 EUR.

Asesoramiento técnico en estudios y ensayos de viento. Atlantica Yield PLC. **IP: Sanz-Herrera, JA**. 2017-2019. 47 756,65 EUR.

CENIT TRAINER. **IP: Sanz-Herrera, JA**. 2012-2013. 45 000 EUR.

Modelo de deformación de láminas. Centro Nacional de Energías Renovables (CENER). **IP: Sanz-Herrera, JA** (Universidad de Sevilla). 2011-2011. 3 000 EUR.

Análisis del diseño mecánico, elaboración del diseño estructural, análisis dinámico y asesoramiento en la construcción y pruebas del sistema procesador de bioetanol. Hynergreen Technologies S.A. Dominguez-Abascal, Jaime (Universidad de Sevilla). 2009-2016. 647 927 EUR. **Research Team**.

Patents.

Sanz-Herrera, José Antonio; Núñez-bootello, Juan Pablo; Doblaré-Castellano, Manuel. ES2566852 A1. Colector solar cilíndrico-parabólico. 14/04/2016. Abengoa Research S.L.