

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

ARTIST PERSONAL INFORMATION			
First name	Luis		
Family name	Sanz Andreu		
Gender (*)		Birth date (dd/mm/yyyy)	
Social Security, Passport, ID number			
e-mail		URL Web	
Open Researcher and Contributor ID (ORCID) (*)			

A.1. Current position

Position	Profesor Titular de Universidad		
Initial date	25/04/2025		
Institution	Universidad de Salamanca		
Department/Center	Dpto. de Bioquímica y Biología Molecular	Facultad de Biología	
Country	Spain	Teleph. number	
Key words	Root growth, cell cycle, stress signaling		

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

Period	Position/Institution/Country/Interruption cause
06/09/2023-24/04/2025	Profesor Ayudante Doctor / Dpto. Bioquímica y Biología Molecular / Universidad de Salamanca
27/05/2021-05/09/2023	Profesor Asociado 6+6 / Dpto. de Didáctica de las Ciencias Experimentales / Facultad de Educación / Universidad de Salamanca
01/12/2020-05/09/2023	Project manager / Oficina de Proyectos Internacionales / Universidad de Salamanca
27/11/2019-30/11/2020	Project manager / Instituto Tecnológico Agrario de Castilla y León / Junta de Castilla y León
08/06/2017-26/11/2019	Project manager / Universidad de Salamanca
11/05/2009–07/06/2017	Investigador postdoctoral / Universidad de Salamanca
01/05/2005–31/01/2009	Investigador postdoctoral / University of Cambridge (UK)

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Bioquímica	Universidad de Salamanca / España	2004

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

Eco-efficient biofertilization based on selected Trichoderma strains for horticultural crops.

From 1999 to 2004, I worked in molecular microbiology at the Department of Microbiology and Genetics (supervised by Prof. Enrique Monte, University of Salamanca). During this stage, I obtained scientific knowledge about Trichoderma (a filamentous fungi which has a recognized effect in promoting plant growth and crop yield) biology and its interaction with plants, soil and other soil borne microorganisms. We published eight peer-reviewed papers on the role of

Trichoderma as beneficial microorganism in agriculture (Montero et al 2007, Journal of Applied Microbiology; Suárez et al 2005, Fungal Genetics and Biology; Vizcaíno et al 2005, FEMS Microbiology Letters; Montero et al 2005, FEBS Journal; Vizcaíno et al 2005, Mycological Research; Sanz et al 2004, FEBS Journal; Hermosa et al 2004, Mycological Research; Sanz et al 2004, Current Genetics) and presented in four national and four international meetings. As a result of my PhD research, I contributed to develop cost-effective Trichoderma-based biofertilizers, with the potential to reduce chemical fertilizer inputs in very intensive and highly polluting cropping systems such as horticulture (<http://www.newbiotechnic.com>). I obtained special awards for my undergraduate degree (2000) and Doctoral Thesis (2005).

Cell division in plants, molecular regulation and developmental integration.

During a postdoctoral stage at the Institute of Biotechnology (supervised by Prof. JAH Murray, University of Cambridge, UK) (2005 to 2008; Marie Curie Intra-European Fellowship FP6-2005-Mobility-5), I acquired key expertise in the molecular regulation of the plant cell cycle and the integration of the cell proliferation in plant development. We aimed to integrate cell-cycle control and the initiation of lateral roots. This project combined genetic, biochemical and physiological tools. I investigated the hypothesis that the D-type cyclins (CYCDs) and their interaction with inhibitor protein KRPs are important for maintaining the organogenic capacity of the pericycle and in the subsequent induction of lateral root induction. The proposed model was that specific CYCDs maintain pericycle cells in a “ready-to-go” state until lateral root induction is triggered by auxin. As such we identified CYCD4;1 as a regulator of cell proliferation within the basal meristem and a modulator of lateral root density (Nieuwland et al 2009, PNAS). Furthermore, we identified CYCD2 and KRP2 as modulators of the auxin response in lateral root formation. This work was published in a leading journal in the field (Sanz et al 2011, The Plant Cell), its content was also included in a book chapter (Sanz et al 2012, To divide and to rule; regulating cell division in roots during post-embryonic growth, Progress in Botany 73, Publisher Springer), and presented in two national and three international meetings. Furthermore, within this research (1) I developed extensive practical experience in the developmental and cellular analysis of cell cycle, (2) I applied the molecular strategies for targeted expression of cell cycle regulators and (3) I familiarised with genome wide transcriptomic profiling.

Integrate cell-fate and cell-cycle control with nitric oxide signalling in the context of plant hormones and stress responses.

From 2009 to 2017 I worked at the Instituto de Investigación en Agrobiotecnología - CIALE (supervised by Prof. O Lorenzo and MD Rodríguez, University of Salamanca) as research staff. I started collaborating with them in the functional analysis of PYL8 ABA receptor in seeds and stress responses (Saavedra et al 2010, Plant Physiology). My research also aimed to understand both molecular mechanisms and developmental roles of nitric oxide (NO) in response to environmental and developmental signals. Research over the last decades has identified NO as a rapidly induced and potent plant growth regulator. This low molecular weight gaseous compound increases threefold to eightfold in concentration within the first hours in response to biotic and abiotic stresses, such as drought, cold and pathogen infection, but also during specific plant developmental processes, such as root gravitropic response. My experiments in the framework of a Marie Curie Reintegration grant (Molecular signaling of nitric oxide (NO) during root growth in Arabidopsis, FP7-People-ERG-2008 NR 239432; 2009-2012) allowed us to identify: i. Novel targets of nitric oxide in the control of seed dormancy and germination (Curto et al 2012, Fitohormonas: Metabolismo y Modo de Acción), ii. Root growth dependence on nitric oxide is linked to auxin transport (Fernández-Marcos, Sanz, et al 2011, PNAS), iii. Nitric oxide regulates stem cell decisions in plants (Sanz et al 2014, Plant Physiol).

Research project manager to support academic colleagues with their multi-partner EU, and regional and government funded projects.

From 2017 to 2023 I took a break from research working as project manager at the Instituto Tecnológico Agrario de Castilla y León (ITACYL, Junta de Castilla y León) and later at the University of Salamanca (Vicerrectorado de Investigación y Transferencia). Due to my expertise in project management, I am used to collaborate actively in the initiation and

consolidation of international research projects and in strengthening the collaboration with the industry sector.

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

C.1. Publications (*see instructions*)

Inmaculada Sánchez Vicente; Tamara Lechón; María Fernández-Marcos; **Luis Sanz**; Óscar Lorenzo. Nitric oxide alters the pattern of auxin maxima and PIN-FORMED1 during shoot development. *Frontiers in Plant Science* 2021; 12: 630792. Decil D1 (Journal Citation Reports, Categoría Plant Science, 2021).

Pablo Albertos; **Luis Sanz**; Isabel Mateos; Inmaculada Sánchez Vicente; Tamara Lechón; Guadalupe Fernández; Dolores Rodríguez; Óscar Lorenzo. Gasotransmission of nitric oxide at early plant developmental stages. *Gasotransmitters in plants*. Springer, 01/03/2016. ISBN: 978-3-319-40711-1. Cuartil Q1 (Scholarly Publishers Indicators (SPI), posición 4/96, Editoriales Extranjeras).

Luis Sanz; Pablo Albertos; Inmaculada Sánchez Vicente; Tamara Lechón Gómez; María Fernández Marcos; Óscar Lorenzo. Nitric oxide (NO) and phytohormones crosstalk during early plant development. *Journal of Experimental Botany*. 66 - 10, pp. 2857 - 2868. 2015. Decil D1 (JCR, Journal Citation Reports, Categoría Plant Science, 2015).

Luis Sanz; María Fernández Marcos; Abelardo Modrego; Daniel R Lewis; Gloria Muday; Stephan Pollmann; Montserrat Dueñas; Celestino Santos Buelga; Óscar Lorenzo. Nitric Oxide Plays a Role in Stem Cell Niche Homeostasis through Its Interaction with Auxin. *Plant Physiology*. 166 - 4, pp. 1972 - 1984. 2014. Decil D1 (JCR, Journal Citation Reports, Categoría Plant Science, 2014).

Luis Sanz; James AH Murray; Walter Dewitte. To divide and to rule: regulating cell division in roots during post-embryonic growth. *Progress in Botany*. 73, SPRINGER, 2012. ISBN: 978-3-540-40721-8 Cuartil Q1 (SPI, posición 4/96, Editoriales Extranjeras).

María Fernández Marcos*; **Luis Sanz***; Dan Lewis; Gloria Muday; Óscar Lorenzo. (* coautoría de primer firmante). Nitric oxide causes root apical meristem defects and growth inhibition while reducing PIN1- dependent acropetal auxin transport. *Proceedings of the National Academy of Sciences USA*. 108 - 45, pp. 18506 - 18511. 2011. Decil D1 (JCR, Journal Citation Reports, Categoría Multidisciplinary Sciences, 2011).

Luis Sanz; Walter Dewitte; Celine Forzani; Farah Patell; Jeroen Nieuwland; Bo Wen; Pedro Quelhas; Sarah De Jager; Craig Titmus; Aurelio Campilho; Hong Ren; Mark Estelle; Hong Wang. The Arabidopsis D-type cyclin CYCD2;1 and the inhibitor ICK2 modulate auxin-induced lateral root formation. *The Plant Cell*. 23 - 2, pp. 641 - 660. American Society of Plant Biologists, 2011. Decil D1 (JCR, Journal Citation Reports, Categoría Biochemistry and Molecular Biology, 2011).

Xandra Saavedra; Abelardo Modrego; María Dolores Rodríguez; María Paz González; **Luis Sanz**; Gregorio Nicolás; Óscar Lorenzo. The Nuclear Interactor PYL8/RCAR3 of the *Fagus sylvatica* FsPP2C1 is a Positive Regulator of ABA Signaling in Seeds and Stress. *Plant Physiology*. 152 - 1, pp. 133 - 150. American Society of Plant Biologists, 2010. Decil D1 (JCR, Journal Citation Reports, Categoría Plant Science, 2010).

Jeroen Nieuwland; Spencer Maughan; Walter Dewitte; Simon Scofield; **Luis Sanz**; James AH Murray. The D-type cyclin CYCD4;1 modulates lateral root density in Arabidopsis by affecting the basal meristem region. *Proceedings of the National Academy of Sciences USA*. 106 - 52, pp. 22528 - 22533. 2009. Decil D1 (JCR, Journal Citation Reports, Categoría Multidisciplinary Sciences, 2009).

María Belén Suárez*; **Luis Sanz***; María Isabel Chamorro; Manuel Rey; Francisco J González; Antonio Llobell; Enrique Monte. (* coautoría de primer firmante). Proteomic analysis of secreted proteins from *Trichoderma harzianum*. Identification of a fungal cell wall-induced aspartic protease. *Fungal Genetics and Biology*. 42 - 11, pp. 924 - 934. Elsevier, 2005. Decil D1 (JCR, Journal Citation Reports, Categoría Mycology, 2005)

C.2. Congress (*participation as speaker in these congresses*)

Title: PHB3 and NOA1 interact to maintain the root stem cell niche in *Arabidopsis*. Authors: Noel Blanco Touriñán; Tamara Lechón; Virginia Palomares; Ivett Barany; Miguel Ángel Blázquez; Miguel Moreno Risueño; Pilar Testillano; Óscar Lorenzo; **Luis Sanz**. Congress: Cell Cycle: The Challenge to coordinate genome stability and morphogenesis. City: Salamanca, España. Date: 04/12/2015. Organizers: Young Life Scientists Symposium (YLS).

Title: Integrating auxin and nitric oxide signalling into plant growth of *Arabidopsis thaliana*. Authors: Tamara Lechón; **Luis Sanz**; Stephan Pollman. Congress: XIII Congreso Luso-Español de Fisiología Vegetal. City: Lisboa, Portugal. Date: 24/07/2013. Organizers: Sociedad Portuguesa de Fisiología Vegetal.

Title: The clade-A protein phosphatase-2C HAB2 is an essential component of the ABA signalling pathway in *Arabidopsis* seeds. Authors: Alejandro Fernández Arbaizar; Hiro Nonogaki; **Luis Sanz**; Óscar Lorenzo. Congress: 10th Conference of the International Society for Seed Science. City: Salvador de Bahía, Brasil. Date: 10/04/2011. Organizers: International Society for Seed Science (ISSS).

Title: Nitric oxide modulation of cell division and cell elongation alters root growth in *Arabidopsis*. Authors: **Luis Sanz**; María Fernández Marcos; Marta Curto Prieto; María Dolores Rodríguez; Óscar Lorenzo. Congress: 20th International Conference on Plant Growth Substance. City: Tarragona, España. Date: 28/06/2010. Organizers: The International Plant Growth Substances Association.

C.3. Research projects

Title: Molecular signaling of nitric oxide during root growth in *Arabidopsis*. Funding entity: Comisión Europea. Convocatoria: PEOPLE: Support for training and career development of researchers (Marie Curie) European Re-integration Grants (ERG). Reference: PERG04-GA-2008-239432. Duration: 11/05/2009 - 15/03/2012. Coordinator: Universidad de Salamanca. Nº of researchers involved: 1. Funded amount: 45.000 €

Title: El óxido nítrico como regulador de la proliferación y diferenciación de las células madre vegetales. Funding entity: Fundación Memoria de Samuel Solórzano Barruso. Reference: FS/16-2014. Duration: 01/01/2015 – 31/12/2015. Nº of researchers involved: 2. Funded amount: 1.440 €

Title: El óxido nítrico como modulador del crecimiento en plantas en situaciones de estrés. Funding entity: Fundación Memoria de Samuel Solórzano Barruso. Reference: FS/17-2010. Duration: 01/01/2011 – 31/12/2011. Nº of researchers involved: 5. Funded amount: 3.000 €

C.4. Contracts, technological or transfer merits

Job position: Técnico de apoyo al Vic. de Investigación y Transferencia.
Activity: Management of research results and transfer of results
Starting date – end date: 01/12/2020 – 05/09/2023
Entity: Universidad de Salamanca

Job position: Técnico de la Unidad Innovación y Divulgación
Activity: Management of research results and transfer of results
Starting date – end date: 27/11/2019 – 30/11/2020
Entity: Instituto Tecnológico Agrario de Castilla y León (ITACyL). Viceconsejería de Agricultura y Ganadería. Junta de Castilla y León