



CURRICULUM VITAE (CVA)

IMPORTANT – The Curriculum Vitae cannot exceed 4 pages. Instructions to fill this document are available on the website.

Part A. PERSONAL INFORMATION

CV date	09/12/2021
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First name	Sara		
Family name	García Linares		
Gender (*)	Female	Birth date (dd/mm/yyyy)	30/08/1987
ID number	47493016V		
e-mail	sglinares@ucm.es	URL Web	https://quimicas.ucm.es/proteinas-toxicas
Open Researcher and Contributor ID (ORCID) (*)	0000-0003-4983-5730		

(*) Mandatory

A.1. Current position

Position	Assistant Professor		
Initial date	02/12/2021		
Institution	Complutense University of Madrid		
Department/Center	Biochemistry and Molecular Biology / Faculty of Medicine		
Country	Spain	Teleph. number	913944266
Key words	Cell signaling, Hedgehog, lipids, pore-forming toxins, actinoporins		

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

Period	Position/Institution/Country/Interruption cause
2013-2017	FPU Fellowship (PhD) / Complutense University / Spain
2017-2019	Postdoctoral Fellowship / Harvard Medical School / USA
2019-2021	Postdoctoral Fellowship / Complutense University / Spain

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
B.Sc. Biochemistry,	Complutense University of Madrid	2011
M.Sc. Biochemistry	Complutense University of Madrid	2012
PhD. Biochemistry	Complutense University of Madrid	2017

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

I completed my bachelor's and master's studies at Complutense University of Madrid, where I also obtained a **FPU fellowship** to carry out my PhD in Biochemistry, Molecular Biology and Biomedicine (program with an Excellence Mention), obtaining the qualification of Outstanding Cum Laude, European PhD Mention and the **Extraordinary PhD Award** from Complutense University. I combined my academic studies with obtaining the Professional Degree of Music in the specialty of violin at the CPM Rodolfo Halffter (2010). I completed my predoctoral training with **two stays at Åbo Akademi University** in Turku, Finland (4 months in 2014 with an EMBO scholarship and 2 months in 2015). These stays resulted in two scientific publications. After obtaining my PhD, I carried out a two-year **postdoctoral stay in the Department of Cell Biology at Harvard Medical School** with a scholarship from the Real Colegio Complutense for Distinguished Junior Scholars. From this period there is a scientific manuscript under second review in *Developmental Cell* journal. In September 2019 I rejoined Complutense University as a Teaching and Research Staff with a UCM-Harvard postdoctoral contract. Since December 2021 I am an **Assistant Professor** at the Department of Biochemistry and Molecular Biology, Faculty of Medicine. I also have the certification of ANECA for Associate Professor (Profesor Contratado Doctor) since 2018.



My scientific training has focused on the areas of Biochemistry, Molecular Biology and, especially, Biophysics. During my doctoral thesis I obtained a wide knowledge about the **function and structure of actinoporins**, toxic proteins of sea anemones that remain soluble and stable in aqueous media but in the presence of biological membranes are able to insert themselves in the lipid bilayer to form transmembrane oligomeric pores. These toxic proteins could be used to kill different types of cells specifically, like cancer cells. Recent results also show that they can be transformed into biological nanoreactors with hydrolytic activity (to degrade plastics, for example). Over the years I have gained great experience in the **production and purification of proteins**, the use of spectroscopic techniques and different methodologies to study protein-lipid interaction, among others. During my stay at Harvard, I worked in the field of cell signaling and learned new laboratory techniques (insect and mammal cell cultures, crystallization techniques, electron microscopy, immunofluorescence) that will allow me to provide new tools in the study of proteins now that I have rejoined the research team at the Complutense University.

I have participated in eight funded research projects, three teaching innovation projects ("IamAble", "EChemTest: Quality Assessment System in Chemistry") and **led a project** of the INNOVA-Docencia UCM program funded by the Chair of Entrepreneurship UCM-Santander ("Social awareness is the vaccine"). I have published 19 scientific articles (seven of them as first author and three as correspondence author), a book chapter and five scientific popularization articles. I have communicated the results of my research in multiple international congresses. I have also organized and participated in numerous **outreach activities** (Science Week, European Researchers' Night, International Day of Women and Girls in Science) and in the training of middle school, high school and Erasmus students, in addition to teaching activities associated with my FPU scholarship and now as a PDI of the Complutense University (over 500 hours), including the direction of TFGs and TFMs (one of them from the Erasmus program), and this year, my first PhD student (to whom I directed his TFG and TFM). I have received several scholarships and taken several courses for my training as a teacher and researcher (over 200 hours). I am a member of several scientific societies (SEBBM, SEB, RSEQ, ACS) and a **board member of the Spanish Society for Biochemistry and Molecular Biology**. My level of English (reading, speaking, and writing) is high (TOEFL: 112 out of 120). During this time, I have continued to combine my research work with musical activity, participating in various international orchestras (Madrid, Turku, Boston).

Part C. RELEVANT MERITS (sorted by typology)

C.1. Publications (see instructions) * Corresponding author

- P. Huang, B. M. Wierbowski, T. Lian, C. Chan, **S. García-Linares**, J. Jiang, A. Salic (2021). "Structural basis for catalyzed assembly of the Sonic hedgehog–Patched1 signaling complex". *Developmental Cell* (under second review).
- E. Rivera-de-Torre, J. Palacios-Ortega, J.P. Slotte, J.G. Gavilanes, Á. Martínez-del-Pozo*, **S. García-Linares*** (2020). "Functional and structural variation among sticholysins, pore-forming proteins from the sea anemone *Stichodactyla helianthus*". *International Journal of Molecular Sciences* 21, 8915.
- E. Rivera-de-Torre, J. Palacios-Ortega, J.G. Gavilanes, Á. Martínez-del-Pozo*, **S. García-Linares*** (2019). "Pore-forming-proteins from cnidarians and arachnids as potential biotechnological tools". *Toxins* 11, 370.
- **S. García-Linares**, E. Rivera-de-Torre, J. Palacios-Ortega, J.G. Gavilanes, Á. Martínez-del-Pozo (2017). "The metamorphic transformation of a water-soluble monomeric protein into an oligomeric transmembrane pore". *Advances in Biomembranes and Lipid Self-Assembly* 26. Elsevier (ISSN 2451-9634 / ISBN 978-0-12-812079-8), 51-97.
- **S. García-Linares**, T. Maula, E. Rivera-de-Torre, K. Morante, K. Tsumoto, J.M.M. Caaveiro, J.G. Gavilanes, J. P. Slotte, Á. Martínez-del-Pozo (2016). "Differential effect of membrane composition on the pore-forming ability of four different sea anemone actinoporins". *Biochemistry* 55, 6630-6641.



- **S. García-Linares**, T. Maula, E. Rivera-de-Torre, J.G. Gavilanes, J.P. Slotte, Á. Martínez-del-Pozo (2016). "Role of the tryptophan residues in the specific interaction of the sea anemone *Stichodactyla helianthus*'s actinoporin sticholysin II with biological membranes". *Biochemistry* 55, 6406-6420.
- **S. García-Linares**, J. Palacios-Ortega, T. Yasuda, M. Åstrand, J.G. Gavilanes, Á. Martínez-del-Pozo, J.P. Slotte (2016). "Toxin-induced pore formation is hindered by intermolecular hydrogen bonding in sphingomyelin bilayers". *Biochimica et Biophysica Acta - Biomembranes* 1858, 1189-1195.
- **S. García-Linares**, I. Alm, T. Maula, J.G. Gavilanes, J.P. Slotte, Á. Martínez-del-Pozo (2015). "The effect of cholesterol on the long-range network of interactions established among sea anemone sticholysin II residues at the water-membrane interface". *Marine Drugs* 13, 1647-1665.
- **S. García-Linares**, R. Richmond, M.F. García-Mayoral, N. Bustamante, M. Bruix, J.G. Gavilanes, Á. Martínez-del-Pozo (2014). "The actinoporins (Arg-Gly-Asp) conserved motif is involved in maintaining the competent oligomerization state of this family of sea anemone toxic proteins". *FEBS Journal* 281, 1465-1478.
- **S. García-Linares**, I. Castrillo, M. Bruix, M. Menéndez, J. Alegre-Cebollada, Á. Martínez-del-Pozo y J.G. Gavilanes (2013). "Three-dimensional structure of the actinoporin sticholysin I. Influence of long-distance effects on protein function". *Archives of Biochemistry and Biophysics* 532, 39-45.

C.2. Congress

- R. Amigot-Sánchez et al. "Engineering of the actinoporin FraC confers hydrolytic activity to the pore channel: building the foundations towards pore-based nanoreactors". 1st International Congress European Venom Network (online, 2021). Oral communication by SGL.
- **S. García-Linares** et al. "Social awareness is the vaccine". Hackathon #VenceAIVirus (Madrid, 2020). Poster.
- **S. García-Linares** et al. "Toxin-induced pore formation is hindered by intermolecular hydrogen bonding in sphingomyelin bilayers". Membrane pores: from structure and assembly to medicine and technology (London, 2016). Poster.
- **S. García-Linares** et al. "Toxin-induced pore formation is hindered by intermolecular hydrogen bonding in sphingomyelin bilayers". XVI Congress of Biophysics Spanish Society (Porto, 2016). Poster.
- **S. García-Linares** et al. "The effect of cholesterol on the long-range network of interactions established among sea anemone sticholysin II residues at the water-membrane interface". FEBS – EMBO Advanced Lecture Course (Corsica, 2015). Poster.
- **S. García-Linares** et al. "The effect of cholesterol on the long-range network of interactions established among sea anemone sticholysin II residues at the water-membrane interface". XV Congress of Biophysics Spanish Society (Granada, 2015). Oral communication.
- **S. García-Linares** et al. "In search of actinoporins residues involved in making a functional membrane pore". VIII Meeting of the National Network for Structure and Function of Proteins (Madrid, 2014). Oral communication.
- **S. García-Linares** et al. "Study of the functional role of the conserved sea anemone actinoporins RGD motif". V Bilbao Advanced Biophysics Workshop on Structure-Function of Ion Channels (Bilbao, 2013). Oral communication.
- **S. García-Linares** et al. "Study of the functional role of the conserved sea anemone actinoporins RGD motif". XIII Congress of Biophysics Spanish Society (Valencia, 2013). Poster
- **S. García-Linares** et al. "Random mutagenesis analysis of the actinoporin StnI from *Stichodactyla helianthus* reveals the importance of particular protein regions for its hemolytic activity". 32nd IUBMB, 37th FEBS, XXXV SEBBM Congress (Sevilla, 2012). Poster.



C.3. Research projects

- “ANTICIPATION and PREVENTION of COVID-19 (ANTICIPA-UCM)”. REACT-EU Funds. 01/01/2022 - 31/12/2022. Researcher (PI: José Manuel Bautista, UCM). 8.500.000 €.
- “Sending and receiving Hedgehog signals”. National Institutes of Health (1R01GM122920-01A1). 01/09/2017 - 31/08/2019. Researcher (PI: Adrian Salic, Harvard Medical School). \$ 431.375.
- “Molecular study of the mechanism of action of toxic proteins with potential biotechnological application”. Complutense University of Madrid (AE1/16-20695). 01/01/2016 - 31/12/2016. Researcher (PI: Álvaro Martínez del Pozo, UCM). 2.422,71 €.
- “Molecular dissection of two families of toxic proteins and their mechanisms of action: ribotoxins and actinoporins”. Science and Innovation Ministry (BFU2012-32404). 01/01/2013 - 30/09/2016. Researcher (PI: Álvaro Martínez del Pozo, UCM). 100.000 €.
- “Study of structure-function relationship in ribotoxins and actinoporins”. Science and Innovation Ministry (BFU2009-10185). 01/01/2010 - 31/12/2012. Researcher (PI: Álvaro Martínez del Pozo, UCM). 169.400 €.
- “Study of structure-function relationship in ribotoxins and actinoporins”. Science and Technology Ministry (BFU2006-04404). 01/03/2009 - 31/12/2009. Researcher (PI: José G. Gavilanes, UVM). 203.038 €.

C.4. Contracts, technological or transfer merits

Seminars

- “UCM against the virus: Experiences”. IV Conference Entrepreneur University UCM (30-11-2020).
- “Elevator Pitch SEBBM” series. Organizer along with María Mayán (2020-2021).
- Nobel Prize in Chemistry 2020. San Alberto Magno. Faculty of Chemistry, UCM (11-11-2020).
- “Structural characterization of the Hedgehog co-receptor protein GAS1”. Presentation of new research lines in the Faculty of Biology, UCM (28-11-2019).

Teaching innovation projects and congresses

- “EChemTest: Quality Assessment System in Chemistry”. INNOVA-Docencia UCM 2021/22, project nº 350, PI: Francisco Javier Sánchez Benítez.
- “Social awareness is the vaccine”. INNOVA-Docencia UCM 2020/21, project nº 34, PI.
- “Social awareness is the vaccine”. PAIECS program, Chair of Entrepreneurship UCM-Santander 2019/20, PI.
- I Multidisciplinary Congress “Social awareness is the vaccine”. Organizing committee (online, 2020).
- “International Annual Conference in Innovative Teaching: Improving the University for Future Generations”. Organizing committee (Cambridge, 2019).

Scientific outreach activities

- “DNA is your ID. What about viruses?”. Science Week UCM (2020, 2021).
- “Venoms, enemies or allies?”. International Day of Women in Science (2020).
- “DNA, our ID”. Science Week UCM (2019).
- “Science on the Big Screen”. Real Colegio Complutense (2018, 2019).
- “Rosetta stone of Biochemistry”. Science Week UCM (2013, 2014, 2015).
- “If you can't beat your enemies, join them (toxic proteins as therapeutic agents)”. European Researchers Night. Faculty of Chemistry, UCM (2013).
- “Eating with all your senses”. Science Week SEBBM(2012).
- “Isolating proteins. The life software”. Science Week UCM (2012, 2013, 2014, 2015).
- “A biochemist in the kitchen”. European Researchers Night. Madrid (2012).
- “Bio-stories and curiosities for children from planet science”. Madrid Book Fair (2012).
- Science and Technology Week. High school “Calderón de la Barca” (2012, 2013, 2014).
- “International Chemistry Year workshop”. Faculty of Chemistry, UCM (2011).