

Part A. PERSONAL INFORMATION

CV date 20-09-2021

First and Family name	Sara García Linares		
Social Security, Passport, ID number	47493016V	Age	34
Researcher codes	ORCID ID (**)	0000-0003-4983-5730	
	SCOPUS Author ID (*)		
	WoS Researcher ID (*)	I-4290-2016	

(*) *Optional*

(**) *Mandatory*

A.1. Current position

Name of University/Institution	Complutense University of Madrid		
Department	Biochemistry and Molecular Biology		
Address and Country	Plaza Ciencias, 2 (Faculty of Chemistry), Spain		
Phone number	913944266	E-mail	sglinares@ucm.es
Current position	Postdoctoral fellow	From	01-09-2019
Key words	Cell, signaling, Hedgehog, lipids, pore-forming toxins, actinoporins		

A.2. Education

PhD, Licensed, Graduate	University	Year
B.Sc. Biochemistry,	Complutense University of Madrid	2011
M.Sc. Biochemistry	Complutense University of Madrid	2012
PhD. Biochemistry <i>Premio extraordinario</i>	Complutense University of Madrid	2017

A.3. General indicators of quality of scientific production (see instructions)

- Total number of citations: 490
- h-index: 13
- Total number of articles published: 19. Seven as first author and three as corresponding author. One more article is submitted.
- Q1 publications: 8 (source: [Google Scholar](https://scholar.google.com/))

Part B. CV SUMMARY (max. 3500 characters, including spaces)

I completed my Bachelor's and Master's studies at the Complutense University of Madrid, where I also obtained a **FPU** scholarship 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 the 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). 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*. In September 2019 I rejoined the Complutense University as a Teaching and Research Staff with a UCM-Harvard postdoctoral contract.

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. 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 seven funded research projects, two teaching innovation projects (*IamAble*) and currently lead 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 and in the training of middle school, high school and Erasmus students, in addition to teaching associated with my FPU scholarship and now as a PDI of the Complutense University, including the direction of TFGs and TFM (one of them from the Erasmus program). I have received several scholarships and taken several courses for my training as a teacher and researcher. 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

C.1. Publications (10 selected from the last 10 years)

- 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.
- I. Alm[§], **S. García-Linares**[§], J.G. Gavilanes, Á. Martínez-del-Pozo, J.P. Slotte (2015). "Cholesterol stimulates and ceramide inhibits sticholysin II-induced pore formation in complex bilayer membranes". *Biochimica et Biophysica Acta - Biomembranes* 1848, 925-931.
- **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.

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§ Authors contributed equally to this work



C.2. Research projects

- “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 €.
- “ESFUNPROT”. Complutense University of Madrid-Santander Bank (GR3/14). 21/11/2014 - 20/11/2015. Researcher (PI: José G. Gavilanes, UCM). 4.526,93 €.
- “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 €.
- “ESFUNPROT”. Complutense University of Madrid-Santander Bank (GR35/10-A - 910023). 01/01/2011 - 31/12/2011. Researcher (PI: José G. Gavilanes, UCM). 13.131,73 €.
- “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.3. Contracts, technological or transfer merits

C.4. Patents

C.5. Congress and scientific meetings

- 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).
- S. García-Linares et al. “Social awareness is the vaccine”. Hackathon #VenceAlVirus (Madrid, 2020). Organizer.
- 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).
- 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).
- 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).
- 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).
- 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).

C.6. 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).

C.7. Teaching activities

- Teaching activities in undergrad courses at the Department of Biochemistry and Molecular Biology (Faculties of Chemistry and Biology): 490 hours.
- Teaching innovation projects and congresses:
 - “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).
- **TFG** (bachelor’s thesis):
 - “Cloning and production of the soluble domain of recombinant human GAS1 in *Pichia pastoris*”, Diego Heras Márquez, 2019-2020. Complutense University of Madrid. Grade: 9,2.
 - “Structural characterization of the Hedgehog co-receptor protein GAS1”, Rafael Amigot Sánchez, 2020-2021. Complutense University of Madrid. Grade: 9,6.
 - “Production and purification of natural and recombinant α -sarcin” (co-directed), Carmen García Montoya, 2020-2021. Complutense University of Madrid. Grade: 9,2.
 - “Production and purification of two different versions of δ -latroinsectotoxin in the yeast *Pichia pastoris*” (co-directed), Rodrigo Pérez Salmerón, 2020-2021. Complutense University of Madrid. Grade: 8,6.
- **TFM** (master’s thesis):
 - “Characterization of toxic protein from widow spider venom” (co-directed), Javier Maraver de Paz, 2019-2020. Complutense University of Madrid. Grade: 9,9.
 - “Production and characterization of the Hedgehog co-receptor protein GAS1 in *Pichia pastoris*”, Diego Heras Márquez, 2020-2021. Complutense University of Madrid. Grade: 9,3.
 - “Analysis of the molecular metamorphosis of pore-forming proteins from the venom of sea anemones” (co-directed), Ana Gorše, 2020-2021. University of Ljubljana. Grade: 10,0.

C.8. Training courses

- “Introduction, data analysis and data visualization with Python” (138 hours). UCM, 2019-2020.
- “Introduction to university teaching for pre and postdocs” (30 hours). UPV/EHU, 2020.
- “Bringing Effective Teaching Practices to your Classroom” (18 hours). Harvard University, 2019.
- “Scientists Teaching Science” (36 hours). Harvard Medical School - STEM Education Solutions, 2018.

C.9. Scientific outreach activities

- “DNA is your ID. What about viruses?”. Science Week UCM (2020).
- “Venoms, enemies or allies?”. International Day of Women in Science (2020).
- “DNA, our ID”. Science Week UCM (2019).
- “Discover Chemistry in action”. European Researchers Night. Faculty of Chemistry, UCM (2019).
- “Science on the Big Screen: GATTACA, Frankenstein, Ex Machina, The Immortal Life of Henrietta Lacks”. 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).