

Federico N. Soria

Personal Information

Date of birth September 20, 1981
 Place of birth Mendoza, Argentina
 Nationalities Argentine, Spanish (EU)
 ORCID ID 0000-0003-1229-9663

Contact details Achucarro Basque Center for Neuroscience
 Parque Científico UPV/EHU, Edif. Sede P3
 Bº Sarriena S/N, 48940 Leioa
 SPAIN

☎ +34 94 601 8284

✉ federico.soria@achucarro.org

🐦 twitter.com/SoriaFN

🐙 github.com/SoriaFN

Bio-sketch

I am a JIN Research Fellow (Jóvenes Investigadores MICIIN) at the University of the Basque Country (UPV/EHU) and Achucarro Basque Center for Neuroscience, Spain. My research is focused on the interplay between the extracellular matrix and glial cells in animal models of aging and brain pathology. I use advanced fluorescence microscopy techniques, script-assisted image analysis and other analytical tools in *in vivo*, *ex vivo* or *3D-in vitro* paradigms, where one can modify the matrix and or neuroinflammation experimentally.

PhD in Neurosciences in 2013 (Universidad del País Vasco, Spain), my doctoral thesis in the team of Dr. Carlos Matute studied glutamate homeostasis in animal models of brain ischemia and multiple sclerosis. These results rendered two important publications in *Journal of Clinical Investigation* (Soria et al., 2014) and *Glia* (Soria et al., 2016). During my postdoctoral journey (2014-2018) at the team of Dr. Erwan Bezard in Bordeaux, I developed super-resolution imaging techniques to analyze the extracellular compartment in animal models of Parkinson's disease. These results, reported in *Nature Communications* (Soria et al., 2020, selected into the Editor Highlights), unraveled the nanoscale organization of the extracellular space in the parkinsonian brain and described an unknown feedback loop between the extracellular matrix and microglia in pathology. This work, and the tools developed here, set the founding stone for my current research at UPV/EHU and Achucarro, focused on the glia-matrix interplay in healthy, aging and pathological brain.

Education

2013	Universidad del País Vasco (Bilbao, Spain)	PhD, Neurosciences
2010	Universidad del País Vasco (Bilbao, Spain)	Master, Neurosciences
2007	Universidad Nacional de San Luis (San Luis, Argentina)	BSc, Molecular Biology

Current Position

2019-ongoing Senior Researcher at the Achucarro Basque Center for Neuroscience and Universidad del País Vasco (UPV/EHU). Spain.

Past Positions

2014-2018	<u>Post-doctoral fellow</u> at the Institut des Maladies Neurodégénératives, CNRS UMR 5293, Univ. Bordeaux, France. Team: Dr. Erwan Bezard.
2009-2013	<u>PhD Student</u> , Laboratory of Neurobiology, Universidad del País Vasco, Spain. Supervisor: Dr. María Domercq. Team: Dr. Carlos Matute.
2007-2008	<u>Undergraduate Student</u> , Instituto Tecnológico de Chascomus (INTECH), Argentina. Supervisor: Dr. Leandro A. Miranda. Team: Dr. Gustavo Somoza.

Peer-reviewed publications in last 10 years (first authorship underlined)

Total publications: 18

Last 10 years: 17

Total citations 19/07/2021: 537 (Scopus); 713 (Google Scholar)

H-index 19/07/2021: 13 (Scopus); 14 (Google Scholar)

1. Calovi S, Soria FN, Tønnesen J. "Super-resolution STED microscopy in live brain tissue." *Neurobiol Dis.* 2021 Jun 5, 156:105420. Review
2. Soria FN, Miguelez C, Peñagarikano O, Tønnesen J. "Current techniques for investigating the brain extracellular space." *Front Neurosci.* 2020 Oct 14, 14:1076. Review
3. Soria FN, Paviolo C, Doudnikoff E, Arotcarena ML, Lee A, Danné N, Mandal AK, Gosset P, Dehay B, Groc L, Cognet L, Bezard E. "Synucleinopathy alters nanoscale organization and diffusion in the brain extracellular space through hyaluronan remodeling." *Nat Commun.* 2020 Jul 10;11(1):3440.
Selected in the 2020's Editor's Highlights.
4. Paviolo C*, Soria FN*, Ferreira JS*, Groc L, Bezard E, Cognet L. "Nanoscale exploration of the extracellular space in the live brain by combining single carbon nanotube tracking and super-resolution imaging analysis." *Methods.* 2020 Mar 1;174:91-99. *Equal contribution.
5. Haida O, Al Sagheer T, Balbous A, Francheteau M, Matas E, Soria F, Fernagut PO, Jaber M. "Sex-dependent behavioural deficits and neuropathology in a maternal immune activation model of autism". *Transl Psychiatry.* 2019 Mar 28;9(1):124.
6. Prevot G*, Soria FN*, Thiolat ML, Daniel J, Verlhac JB, Blanchard-Desce M, Bezard E, Barthelemy P, Crauste-Manciet S, Dehay B. "Harnessing Lysosomal pH through PLGA Nanoemulsion as a Treatment of Lysosomal-related Neurodegenerative Diseases." *Bioconjug Chem.* 2018. Nov 13;29(12):4083-9. *Featured in the journal cover.* *Equal contribution.
7. Perez-Villalba A, Sirerol-Piquer MS, Belenguer G, Soriano-Canton R, Muñoz-Machado AB, Villadiego J, Alarcón-Arís D, Soria FN, Dehay B, Bezard E, Vila M, Bortolozzi A, Toledo-Aral JJ, Pérez-Sánchez F, Fariñas I. "Synaptic regulator α -synuclein in dopaminergic fibers is essentially required for the maintenance of subependymal neural stem cells." *J Neurosci.* 2018. Jan 24; 38(4):814-825.
8. Bido S, Soria FN, Fan RZ, Bezard E, Tieu K. "Mitochondrial division inhibitor-1 is neuroprotective in the A53T- α -synuclein rat model of Parkinson's disease." *Sci Rep.* 2017. Aug 8;7(1):7495.
9. Soria FN, Engeln M, Martinez-Vicente M, Gangletas C, Lopez MJ, Dovero S, Dehay B, Normand E, Vila M, Favreux A, Georges F, Lo Bianco C, Bezard E, Fernagut PO. "Glucocerebrosidase deficiency in dopaminergic neurons induces microglial activation without neurodegeneration." *Hum Mol Genet.* 2017. May 17;26(14):2603-15.
10. Soria FN, Pampliega O, Bourdenx M, Meissner WG, Bezard E, Dehay B. "Exosomes, an unmasked culprit in neurodegenerative diseases." *Front Neurosci.* 2017. Jan;11:26. Review.
11. Soria FN, Zabala A, Pampliega O, Palomino A, Miguelez C, Ugedo L, Sato H, Matute C, Domercq M. "Cystine/glutamate antiporter blockage induces myelin degeneration." *Glia.* 2016. Aug;64(8):1381-95.
12. Bourdenx M, Daniel J, Genin E, Soria FN, Blanchard-Desce M, Bezard E, Dehay B. "Nanoparticles restore lysosomal acidification defects: Implication for Parkinson's and other lysosomal-related diseases." *Autophagy.* 2016. Mar 3;12(3):472-83.
13. Martin A, Vazquez-Villoldo N, Gomez-Vallejo V, Padro D, Soria FN, Szczupak B, Plaza-García S, Arrieta A, Reese T, Llop J, Domercq M, Matute C. "In vivo imaging of system xc- as a novel approach to monitor multiple sclerosis." *Eur J Nucl Med.* 2015. Jun; 43(6):1124-38.
14. Soria FN, Perez-Samartin A, Martin A, Gona KB, Llop J, Szczupak B, Chara JC, Matute C, Domercq M. "Extrasynaptic glutamate release through cystine/glutamate antiporter contributes to ischemic damage." *J Clin Invest.* 2014. Aug;124(8):3645-55.
Commented in Reissner KJ (2014) The cystine/glutamate antiporter: when too much of a good thing goes bad. J Clin Invest 124(8):3279–81.
15. Domercq M, Mato S, Soria FN, Sánchez-Gómez MV, Alberdi E, Matute C. "Zn²⁺-induced ERK activation mediates PARP-1-dependent ischemic-reoxygenation damage to oligodendrocytes." *Glia.* 2013. Mar; 61(3):383-93.
16. Elisio M, Soria FN, Fernandino JI, Strussmann CA, Somoza GM, Miranda LA. "Extrahypophyseal expression of gonadotropin subunits in pejerrey *Odontesthes bonariensis* and effects of high water temperatures on their expression." *Gen Comp Endocrinol.* 2012. Jan 15;175(2):329-36.
17. Pampliega O, Domercq M, Soria FN, Villoslada P, Rodriguez-Antiguedad A, Matute C. "Increased expression of cystine/glutamate antiporter in multiple sclerosis." *J Neuroinflammation.* 2011. Jun 3;8:63.

Software

1. Soria FN. Lysosome_analysis v1.0. *ImageJ scripts for analysis of lysosomes in vivo in fluorescence images.* Zenodo, 2021. DOI: 10.5281/zenodo.4435278.
2. Soria FN. Microglia_tools (beta). *ImageJ scripts for analysis of two-photon time-lapse images of microglia.* Github, 2020. Latest version available at https://github.com/SoriaFN/Microglia_tools

Grants as PI

2021-2024	PID2020-115896RJ-I00	Ministry of Science (Spain)	181,500 €
	<i>Matrix-microglia interactions in the aging brain</i>		PI
2020-2021	PIBA_2020_1_0061	Basque Government (Spain)	24,323 €
	<i>Papel de la matriz extracelular en la motilidad microglial.</i>		PI

Other grants

2021	ASAP-020505	M.J.Fox Foundation – ASAP (USA)	10,000,000 €
	<i>Activity and connectivity drive neuronal vulnerability and disease progression in Parkinson's disease</i>		Collaborator
2019	INF19/29	UPV/EHU (Spain)	30,297.4 €
	<i>Acquisition of a Katana picosecond laser for STED microscope.</i>		Participant
2016-2018	FF00066525	Fondation de France	94,050 €
	<i>Restauration de la dysfonction lysosomale par des nanoformulations acides dans la maladie de Parkinson</i>		Participant

Awards, fellowships and R+D contracts

2021-2024	JIN (Jóvenes Investigadores) <u>Research Contract</u> , Spain	105,000 €
2019-2021	Juan de la Cierva-Incorporación <u>Post-doctoral Grant</u> , Spain.	64,000 €
2017-2019	Basque Government International <u>Postdoctoral Fellowship</u> , Spain.	117,000 €
2013	<u>Doctor cum laude</u> , Universidad del País Vasco, Spain.	
2009-2013	FIS <u>PhD Fellowship</u> , Instituto de Salud Carlos III, Spain.	82,400 €

Short-term stays abroad

2012	Albert Einstein College of Medicine, New York, USA. Rajat Singh's Lab (3 months)		
------	--	--	--

Teaching

2019-ongoing	Máster de Neurociencia (Universidad del País Vasco, Spain).		
	<i>Tendencias en Neurociencias (0.1 credits)</i>		
	<i>Imagen Funcional en Neurociencias: Microscopía bi-fotón (0.2 credits)</i>		
2020-ongoing	Máster de Biología Molecular y Biomedicina (Universidad del País Vasco, Spain).		
	<i>Neurociencias (0.5 credits)</i>		

Mentoring

PhD Thesis	2021-ongoing	Irene Tomé-Velasco (Universidad del País Vasco, Spain).	
	2020-ongoing	Laura Bayón (Universidad del País Vasco, Spain). <i>Co-supervisor</i> .	
Master	2021-ongoing	Nerea Urrestizala (Universidad Complutense de Madrid, Spain).	
	2020	David Gallardo (Universidad del País Vasco, Spain).	
	2018	Philippe Gosset (Univ. Paris Descartes, France). <i>At Bordeaux</i> .	
Undergraduate	2020	Paula Rodrigo Martín (Universidad del País Vasco, Spain).	
	2021	Lorena Díaz Fernandez (Universidad del País Vasco, Spain).	

Reviewing Activities

Reviewer	Biology (MDPI), Brain Research (Elsevier), Cells (MDPI), Frontiers in Neuroscience (Frontiers), International Journal of Molecular Sciences (MDPI), Neurobiology of Disease (Elsevier), Mediators of Inflammation (Hindawi), Theranostics (Ivyspring).		
----------	--	--	--

Committees and organization of R+D activities

2020 Achucarro Winter Symposium

Institutional Responsibilities

2016-2018 Elected Member of the Scientific Council of the Institut des Maladies Neurodégénératives, France.

Professional Memberships

2020-ongoing Member, Sociedad Española de Neurociencias

2016-2018 Member, Société des Neurosciences (France)

2012-2016 Member, Society for Neuroscience (USA)

Certifications

2021 Animal experimentation – Function D (Bizkaia Provincial Council, Spain)

2019 Good Laboratory Practices (UPV/EHU, Spain)

2016 Specialization in animal surgery (CNRS, France)

2015 Animal experimentation Level 1 – Conceptor rodents (CNRS, France)

2009 Animal experimentation Category B (Bizkaia Provincial Council, Spain)

Languages

Spanish Native proficiency

English Bilingual proficiency

French Full professional proficiency

Invited speaker

1. "CIBERNED Webinars", Online, Spain. Mar 11, 2021.
2. "Bordeaux Neurocampus Day", Université de Bordeaux, France. May 17, 2018.
3. "Journée Synapse 2017", Université de Bordeaux, France. Mar 31, 2017.