Lillian Cruz-Orengo, Ph.D.
Assistant Professor in Neuroimmunology

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RESEARCH INTEREST

My career goal is to elucidate the mechanisms underlying the neuropathophysiology surrounding sex-biased autoimmune disorders. More specifically the neuroimmune interactions at the blood-brain barrier and their role in female susceptibility to autoimmunity.

HIGHLIGHTS

- Developed a method for CNS region-specific microvessels isolation (Dayton et al, J Neurosci Methods. 2019).
- Described an autosomal genetic target responsible for sexual bias in CNS autoimmune susceptibility, subject to pharmacological manipulation (Cruz-Orengo et al, J Clin Invest. 2014).
- First use of *in vivo* sodium fluorescein permeability assay to assess BBB disruption in EAE (Cruz-Orengo et al, J Clin Invest. 2014).
- Developed an artificial human BBB to assess lymphocyte migration (Daniels et al, J Neurosci Methods. 2013).
- Dual-therapeutic use of a chemokine receptor antagonist to ameliorate EAE and axonal loss prevention (Cruz-Orengo et al., J Exp. Med. 2011 & J Neuroinflammation. 2011).
- Described of therapeutic usage of an endogenous prostaglandin to ameliorate chronic pain (Cruz-Orengo et al., Mol Pain. 2008).

EDUCATION & POSTDOCTORAL TRAINING

Postdoctoral Research Scholar. Internal Medicine, Washington University School of Medicine.	2008-13
Postdoctoral Research Scholar. Anesthesiology, Washington University School of Medicine.	2006-08
Ph.D. Physiology, Neuroscience. University of Puerto Rico.	2006
B.S. Biology, Art History. University of Puerto Rico.	1988

AWARDS

UC Davis Early Career Faculty Award for Creativity and Innovation. University of California, Davis.	2018
NIEHS Core Center for Environmental Health Sciences at UC Davis Pilot Projects Program. UC Davis.	2016
CAMPOS Faculty Scholar Award. UC Davis.	2014
Ruth L. Kirschstein National Research Service Awards for Individual Postdoctoral Fellows. NINDS.	2011
AAI Abstract Award and FASEB-MARC Travel Award. 97th AAI Annual Meeting.	2010
6th Annual Postdoctoral Scientific Symposium, Washington University School of Medicine.	2010
Research Supplement to Promote Diversity in Health-Related Research. NINDS.	2009

Ramón Emeterio Betances Award. University of Puerto Rico.	2006
Leadership & Scientific Excellence Awards. University of Puerto Rico.	2006
Central Nervous System Abstract Award. FASEB-MARC Travel Award International Union of Physiological Sciences and EB 2005 Meeting.	2005
Robert Laurus Award. AAAS Caribbean Division.	2003
MARC Undergraduate Honor Program, University of Puerto Rico.	1986-88

APPOINTMENTS

Executive Committee. Graduate Group in Immunology, UC Davis.	2015-
Executive Council. Washington University Postdoctoral Society, Washington University School of Medicine.	2010-13
Steering Committee. Diversity Postdoctoral Association, WUSM.	2008-10
Moving into the Future: New Dimensions and Strategies for Women's Health Research. Office of Research on Women's Health-NIH, WUSM.	2009
Committee on Strategic Planning Process. Office of Postdoctoral Affairs, WUSM.	2008
Committee on Strategic Goals Planning. School of Medicine, University of Puerto Rico.	2002
Committee on Graduate Education in Basic Sciences. School of Medicine, University of Puerto Rico.	2002
Steering Committee for the Institutional Self-Study for LCME accreditation. School of Medicine, University of Puerto Rico.	2002
Student Representative to Academic Senate. School of Medicine, University of Puerto Rico.	2001-02

PUBLICATIONS

Yuan Y, Dayton JR, Freese ML, Dorflinger BG, Cruz-Orengo L. Reliable isolation of central nervous system microvessels across five vertebrate groups. JoVE, *in press*.

Brien JD, Hassert M, Stone ET, Geerling E, Cruz-Orengo L, Pinto AK. Isolation and quantification of zika virus from multiple mrgans in a mouse. J Vis Exp. 2019 Aug 15;(150). doi: 10.3791/59632.

Dayton JR, Franke MC, Yuan Y, Cruz-Orengo L. Straightforward method for singularized and region-specific CNS microvessels isolation. J Neurosci Methods. 2019; 318:17-33.

Rodriguez RR, Albeck JG, Taha AY, Ori-McKenney K, Recanzone GH, Stradleigh TW, Hernandez BC, Tang F-Y, Chiang E-P, Cruz-Orengo L. Impact of diet-derived signaling molecules on human cognition: Exploring the Food-Brain Axis. Nature, Science of Food. 2017; 1(2):1-11.

Cruz-Orengo L, Daniels BP, Dorsey D, Basak SA, Grajales-Reyes JG, McCandless EE, Piccio L, Schmidt RE, Cross AH, Crosby SD, Klein RS. Enhanced sphingosine-1-phosphate receptor 2 expression underlies female CNS autoimmunity susceptibility. J Clin Invest. 2014; 124(6):2571-84.

Daniels BP, Cruz-Orengo L, Holman DW, Jujjavarapu H, Durrant DM, Klein RS. Viral pathogen-associated molecular patterns regulate blood-brain barrier integrity via competing innate cytokine signals. mBio 2014; vol. 5 no. 5 e01476-14.

Daniels BP, Cruz-Orengo L, Holman DW, Jujjavarapu H, Durrant DM, Klein RS. Pathogen recognition regulates blood brain barrier integrity during West Nile virus encephalitis via type I interferon signaling. J Neuroimm 2014; 275(1-2):29-30.

Daniels BP, Cruz-Orengo L, Pasieka TJ, Couraud PO, Romero IA, Weksler B, Cooper JA, Doering TL, Klein RS. Immortalized human cerebral microvascular endothelial cells maintain the properties of primary cells in an in vitro model of immune migration across the blood brain barrier. J Neurosci Methods. 2013; 212(1):173-9.

Cruz-Orengo L, Chen YJ, Kim JH, Dorsey D, Song SK, Klein RS. CXCR7 antagonism prevents axonal injury during experimental autoimmune encephalomyelitis as revealed by in vivo axial diffusivity. J Neuroinflammation. 2011; 8:170.

Cruz-Orengo L, Holman DW, Dorsey D, Zhou L, Zhang P, Wright M, McCandless EE, Patel JR, Luker GD, Littman DR, Russell JH, Klein RS. CXCR7 influences leukocyte entry into the CNS parenchyma by controlling abluminal CXCL12 abundance during autoimmunity. J Exp Med. 2011; 208(2):327-39.

Cruz-Orengo L, Dhaka A, Heuermann RJ, Young TJ, Montana MC, Cavanaugh EJ, Kim D, Story GM. Cutaneous nociception evoked by 15-delta PGJ2 via activation of ion channel TRPA1. Mol Pain. 2008; 4:30.

Cruz-Orengo L, Figueroa JD, Torrado A, Puig A, Whittemore SR, Miranda JD. Reduction of EphA4 receptor expression after spinal cord injury does not induce axonal regeneration or return of tcMMEP response. Neurosci Lett. 2007; 418(1):49-54.

Cruz-Orengo L, Figueroa JD, Velázquez I, Torrado A, Ortíz C, Hernández C, Puig A, Segarra AC, Whittemore SR, Miranda JD. Blocking EphA4 upregulation after spinal cord injury results in enhanced chronic pain. Exp Neurol. 2006; 202 (2):421-33.

Irizarry-Ramírez M, Willson CA, Cruz-Orengo L, Figueroa J, Velázquez I, Jones H, Foster RD, Whittemore SR, Miranda JD. Upregulation of EphA3 receptor after spinal cord injury. J Neurotrauma. 2005; 22(8):929-35.

Willson CA, Irizarry-Ramírez M, Gaskins HE, Cruz-Orengo L, Figueroa JD, Whittemore SR, Miranda JD. Upregulation of EphA receptor expression in the injured adult rat spinal cord. Cell Transplant. 2002; 11(3):229-39.

Marie B, Cruz-Orengo L, Blagburn JM. Persistent engrailed expression is required to determine sensory axon trajectory, branching, and target choice. J Neurosci. 2002; 22(3):832-41.

TEACHING

Lecturer. Physiology of Neuroimmune Interactions. College of Biological Sciences, UC Davis.	2018-
Lecturer. Emerging Issues at the Interface of Ecosystem, Animal and Human Health. School of Veterinary Medicine, UC Davis.	2017-
Lecturer and Laboratory Instructor. Basic Foundations. School of Veterinary Medicine, UC Davis.	2016-
Lecturer. Comparative Organology. School of Veterinary Medicine, UC Davis.	2016-
Laboratory Instructor. Neuro/Senses/Behavior. School of Veterinary Medicine, UC Davis.	2015-
Invited Lecturer. Biomedical Ethics. School of Medicine, University of Puerto Rico.	2005-06
Lecturer. Dental Neurophysiology. School of Dentistry, University of Puerto Rico.	2003-05
Teacher Assistant. Medical Physiology. School of Medicine, University of Puerto Rico.	2001-05
Invited Lecturer. Clinical Biochemistry. College of Health Related Professions, University of Puerto Rico.	2001-03
Teacher Assistant. Medical Neuroscience. School of Medicine, University of Puerto Rico.	2001-02

PROFESSIONAL SOCIETIES

International Brain Barriers Society	2018
Association for Women in Science	2013
Organization for the Study of Sex Differences	2010
The American Physiological Society	2000