

BIOGRAPHICAL SKETCH

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NAME: Cruz-Bermúdez, Nelson David

eRA COMMONS USER NAME (credential, e.g., agency login):

POSITION TITLE: Associate Professor of Psychology

EDUCATION/TRAINING (*Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.*)

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
University of Puerto Rico, Río Piedras	B.A.	06/2001	Psychology
Brandeis University, Waltham, MA	Ph.D.	05/2007	Neuroscience
Brown University, Providence, RI	Postdoctoral	08/2008	Neuroscience

A. Personal Statement

I have the training, expertise, leadership and motivation necessary to successfully carry out the proposed research project. I acquired experience in experimental design and data analysis as an undergraduate student while working on homophobia, depression and psychophysiology. In graduate school and as a post-doc, I became an expert in electrophysiological, molecular and pharmacological techniques, published most of my work (see Contribution to Science) and I learned how to organize, manage and supervise a research laboratory. When I was hired as a professor by the University of Puerto Rico in 2008, my rate of publications slightly decreased over a short period mostly because I had a full course load and almost no time to investigate. Nevertheless, after obtaining time for research, I immediately developed small research projects that have collectively allowed me to fine-tune my research skills in quantitative and qualitative survey research, neuropsychology and computerized experimental paradigms. I have addressed research questions on better educational strategies and research opportunities for pre-college students and have done secondary data analysis on mental health. In my recent publications, I discuss theoretical and practical issues that interfere with interdisciplinary research on mental health.

Recently, I have mastered the use of electroencephalography (EEG) to carry out research on human neuropsychophysiology. I attended an intensive EEG course at the University of Porto in Portugal and have spent hours of practice with the EEG system. I have the first EEG laboratory located at the Institute for Psychological Research (IPR) that will allow me to carry out large-scale clinical and translational studies with human subjects from different sectors of the population. The IPR supports clinical research and its atmosphere of collaborative research has pushed projects such as the one proposed here that integrates cognitive neuroscience and clinical research. I have established part of the infrastructure necessary for the proposed research plan by developing strong ties with the leading scientists and staff of the IPR. This connection will make it possible to successfully administer this project, collaborate with other researchers and generate several peer-reviewed publications. I am aware of the importance of maintaining frequent communication among project researchers and the mentor, and of constructing a realistic research plan, timeline and budget. The proposed pilot study builds on a semi-new area of research for me, but it can be effectively accomplished with my technical expertise, research environment, and personal drive and perseverance.

1. Cruz-Bermúdez, N. D., & Ortiz-Torres, B. (2009). Homophobia perceived in a group of gay men living with HIV [Spanish]. In R. Nina-Estrella, D. Miranda-Gierbolini, B. Ortiz-Torres (Eds.), *Temas de la Psicología* (pp. 225-239), San Juan: Publicaciones Puertorriqueñas.
2. Cruz-Bermúdez, N. D. (2010). Ten basic fundamentals of neuroscience for psychology [Spanish]. *Revista Griot*, 3(2), 19-36.

3. Cruz-Bermúdez, N. D. (2013). Psychology, neuroscience and drug addiction in Puerto Rico: implications for interdisciplinary research [Spanish]. *Revista Puertorriqueña de Psicología*, 24(2), 1-13.
4. Torres-Ruiz, S., Claribel Ojeda- Reyes, C., Brown, R., Aponte-Ramírez, J., Agosto-Rivera, J. L., & Cruz-Bermúdez, N. D. (2015). Authentic research experiences for public high school teachers and students in Puerto Rico: university-high school partnership. [Manuscript to be re-submitted to the *Electronic Journal of Science Education*]

B. Positions and Honors

Positions and Employment

2007-2008	Post-doctoral Fellow, Department of Molecular Pharmacology, Physiology and Biotechnology, Brown University, RI
2008-2013	Assistant Professor, Department of Psychology, University of Puerto Rico, Río Piedras
2013-	Associate Professor, Department of Psychology, University of Puerto Rico, Río Piedras

Other Experience and Professional Memberships

2002	Member, Society for Neuroscience
2009	Member, National Hispanic Science Network on Drug Abuse
2009	Member, Molecular and Cellular Cognition Society PR Chapter
2010	Member, Puerto Rican Association of University Professors
2011-	President, P.I.N.K. Consulting Group, Inc., San Juan, PR
2012-	Consultant, Puerto Rico Psychological Association, San Juan, PR

Honors

1999	Fellow, MARC Summer Program, Department of Human Health & Family Studies Pennsylvania State University, University Park, PA
1999-2001	Fellow, NIMH Career Opportunities in Research Education & Training Program (COR), Department of Psychology, University of Puerto Rico, Río Piedras
2000	Fellow, Multicultural Undergraduate Research Program, Institute of Child Development, University of Minnesota, Minneapolis, MN
2001	Graduated Magna Cum Laude and Dean's List, University of Puerto Rico, Río Piedras
2001-2002	Predocotrinal Mental Health Research Fellowship, Minority Fellowship Program American Psychological Association, Washington, DC
2002	Fellow, Summer Program in Neuroscience, Ethics & Survival Skills Marine Biological Laboratory, MA
2002-2005	Predocotrinal Neuroscience Fellowship, Diversity Program in Neuroscience American Psychological Association, Washington, DC
2005-2006	Predocotrinal Ruth L. Kirschstein National Research Service Award (NRSA) for Individual Fellows, National Institute of Neurological Disorders & Stroke, NIH, Bethesda, MD
2007-2008	Postdoctoral Research Supplement for Underrepresented Minorities National Institute of Mental Health, NIH, Bethesda, MD
2008	Travel Award, NIDA Mini Convention, Frontiers in Addiction Research, 38th Society for Neuroscience Meeting, Washington, DC
2013	Scholar, Public Responsibility in Medicine & Research Institutional Capacity Building Scholarship Program, 2013 Advancing Ethical Research Conference, Boston, MA

C. Contribution to Science

My early publications addressed how modulators alter the intrinsic properties and output of neuronal networks such as the motor central pattern generators found in invertebrate organisms. Measuring how neuroactive substances regulate and modify circuit functioning is crucial to fully elucidate and understand the physiological and molecular mechanisms that govern the nervous system. In these publications, I documented excitatory and inhibitory modulation of two key motor networks controlling the contractions of the heart and stomach of crustaceans. Multiple modulators seem to be important to coordinate the activity of these organs in response to external stimuli or endogenous physiological states. Additionally, my work provided evidence that some ion channels appear to be regulated in a coordinated fashion, while others may be controlled by a

mixture of additional strategies to ensure proper physiological functioning. I served as the primary investigator or co-investigator in all of these studies.

1. Mahadevan, A., Lappé, J., Rhyne, R., Cruz-Bermúdez, N. D., Marder, E., & Goy, M. (2004). Nitric oxide inhibits the rate and strength of cardiac contractions in the lobster *Homarus americanus* by acting on the cardiac ganglion. *Journal of Neuroscience*, 24, 2813-2824.
2. Cruz-Bermúdez, N. D., Fu, Q., Kutz-Naber, K. K., Christie, A. E., Li, L., & Marder, E. (2006). Mass spectrometric characterization and physiological actions of GAHKNYLRFamide, a novel FMRF-like peptide from crabs of the genus *Cancer*. *Journal of Neurochemistry*, 97, 784-799.
3. Cruz-Bermúdez, N. D., & Marder, E. (2007). Multiple modulators act on the cardiac ganglion of the crab, *Cancer borealis*. *Journal of Experimental Biology*, 210, 2873-2884.
4. Tobin, A-E., Cruz-Bermúdez, N. D., Marder, E. & Schulz, D. J. (2009). Correlations in ion channel mRNA in rhythmically active neurons. *PLoS ONE*, 4(8), e6742.

Many laboratories have done extensive research on the neurobiological mechanisms implicated in drug addiction using animal models. These efforts have collectively contributed to our understanding of the molecular and physiological changes in the brain after being exposed to addictive drugs. During my post-doc, I carried out a series of experiments using patch clamp electrophysiology on the rodent brain slice preparation to study processes underlying long-term potentiation of excitatory synapses in the midbrain. I co-authored a literature review focused on neurobiological studies of drug addiction and presented preliminary data at the Society for Neuroscience meeting. I obtained my tenure-track position one year after I began my post-doc.

1. Cruz-Bermúdez, N. D. & Kauer, J. A. (Nov. 2008). Nitric oxide and cAMP-PKA signaling pathways potentiate excitatory synaptic transmission in the ventral tegmental area. **38th Society for Neuroscience Annual Meeting**, Washington, DC.
2. Niehaus, J., Cruz-Bermúdez, N. D., & Kauer, J. A. (2009). Plasticity of addiction: A mesolimbic dopamine short-circuit? *American Journal on Addictions*, 18, 259-271.

In recent years, I have devoted time for studying the experiences and recovery processes of women who are in rehabilitation programs for drug addiction. I have also analyzed the perspectives of four parents whose sons were in rehabilitation programs for addiction. Additionally, I am studying the patterns of energy drinks and alcohol consumption among college students using self-reports, interviews and focus groups techniques with collaborators. These projects have allowed me to deepen into mental health research questions and to diversify my repertoire of research techniques useful to carry out biobehavioral and clinical studies. Most of data collected is currently undergoing final analysis for later publications.

1. Laboy-García, G. M., Cruz-Bermúdez, N. D., Gisela Negrón-Velázquez, G., & Sosa-Arrufat, R. (2015). Perspectives and experiences of the parents of former drug addicts in a rehabilitation program. Manuscript in preparation.
2. González González, J. I., & Cruz-Bermúdez, N.D. (2015). Implications of drug intake cessation among heroin addicts: a biopsychosocial perspective. Manuscript in preparation.
3. Rodríguez-Romero, A., & Cruz-Bermúdez, N.D. (2015). Interpretative phenomenological analysis of the experiences of five women in recovery from drug addiction. Manuscript in preparation.
4. Cabezas, E., De León, J., Matos, N., Narváez-Pérez, K., Cruz-Bermúdez, N. & Díaz-Ríos, M. (2015). Energy drinks consumption patterns among college students at the University of Puerto Rico. Manuscript in preparation.

Complete List of Published Work in MyBibliography

<http://www.ncbi.nlm.nih.gov/myncbi/browse/collection/47278712/?sort=date&direction=ascending>

D. Research Support

Ongoing Research Support

Research release time, University of Puerto Rico, Río Piedras 02/15/14-present
Validation of a working memory assessment for Puerto Rican adults

The aim of this project is validate a psychological test that measures working memory in a representative sample of the Puerto Rican adult population.

Role: P.I.

Institutional Funds for Research, University of Puerto Rico, Río Piedras Giray (PI) 07/01/13-06/30/15
Neuroscience authentic research experiences for pre-college students

The aim of this sub-project is to describe and measure the experience of high school students who are actively working on university laboratories with professors carrying out neuropharmacology and behavioral-related experiments.

Role: Co-Investigator

Research release time, University of Puerto Rico, Río Piedras Díaz-Ríos (PI) 07/01/12-06/30/15
Patterns of energy drinks consumption among college students

The aim of the project is to characterize the pattern of caffeine containing drinks and alcohol among college students.

Role: Co-Investigator

Completed Research Support

Institutional Funds for Research, University of Puerto Rico, Río Piedras 07/01/12-06/30/14
Integration of cognitive neuroscience experimental paradigms in an undergraduate-level Biopsychology course

The aim of this study was to measure hand-on cognitive neuroscience research experiences for undergraduate students while taking the course Biopsychology. A wide variety of computer-based paradigms and software (e.g., Emotional Stroop Task) were used by students to carry out experiments and analyze data (e.g., accuracy, reaction time).

Role: P.I.