PAOLA GIUSTI-RODRÍGUEZ, PH.D.

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PROFESSIONAL EXPERIENCE

Research Assistant Professor, Department of Genetics, **University of North Carolina-Chapel Hill**, 2016-

Postdoctoral Research Associate, Department of Genetics, **University of North Carolina-Chapel Hill**, 2012-2016
Advisor: Patrick F. Sullivan, M.D.

EDUCATION

Ph.D. Cell and Developmental Biology**, Harvard University**, June 2011
Dissertation: Assessing the roles of Cdk5/p25 in synaptic plasticity and neurodegeneration.
Thesis advisor: Li-Huei Tsai, Ph.D.

B.S. Biology, **University of Puerto Rico-Río Piedras**, June 2003
Magna Cum Laude
Honor's Thesis: Tryptophan substitutions in the alpha M4 domain of the Torpedo californica nicotinic acetylcholine receptor (nAChR) alter the sensitivity to 1-Octanol.

RESEARCH FUNDING

ACTIVE

Award: 5U01MH109528-04S1 Sponsor: NIH (NIMH) Project period: 04/1/2020-03/31/2021 Effort: 1.20 calendar Role: Co-Investigator

Establishment of a new consortium to diversify human genomics studies

I am co-Investigator of this Administrative Supplement and co-founder/leader of the Latin American Genomics Consortium (LAGC), which aims to increase the number of Latinx samples included in psychiatric genomics studies, develop methods for the analysis of admixed samples, and carryout meta-analyses of psychiatric traits in Latinx populations.

Award: 5R01MH077139-10 Sponsor: NIH (NIMH) Project period: 04/01/2006-04/30/2021 (NCE) Effort: 0.05 calendar Role: Co-Investigator

1/2 A Large Scale Schizophrenia Association Study in Sweden

The goal of this project is learn more about the genetics of schizophrenia and how genes and environment might act and interact to alter the disease risk.

Award: 283-2497 Sponsor: Duke University/Open Philanthropy Project Fund Project period: 09/01/2018-08/31/2021 Effort: 0.24 calendar Role: Co-Investigator

To support research on the development CRISPR-based epigenome editing tools to refine genome wide association studies

The goal of this project is to use epigenome editing tools to functionally characterize schizophrenia-associated non-coding regions and risk variants.

Award: 5K01MH109772-04 Sponsor: NIH (NIMH) Project period: 04/01/2016-03/31/2021 (NCE) Effort: 9.00 calendar Role: Principal Investigator

Interpreting GWAS associations in schizophrenia using genome-wide chromatin mapping

The goal of this study is to generate high-resolution chromatin interaction data from fetal and adult brain in order to interpret and prioritize findings from schizophrenia genome-wide association studies (GWAS).

ZZC8ANALMQ C850803103 Sponsor: Karolinska Institutet/Swedish Research Council Project period: 04/01/2020-03/31/2021 Effort: 1.32 calendar Role: Principal Investigator Budget: $209,826

CNV mouse models and RNA splicing

The goal of this research proposal is to generate comprehensive functional genomic data from multiple mouse models of human psychiatric CNVs in order to develop mechanistic understanding of how these CNVs relate to psychiatric phenotypes and to generate complete transcriptomic profiles of brains from SCZ cases (n = 15) vs controls (n = 15) and identify potential differences in RNA isoform levels between cases and controls using long-read RNA-seq.

PUBLICATIONS

Giusti-Rodríguez, P. *, Xenakis, J. G. *, Crowley, J. J., Nonneman, R. J., Decristo, D. M., Ryan, A., Quackenbush, C. R., Miller, D. R., Shaw, G. S., Zhabotynsky, V., Sullivan, P. F.†, Pardo-Manuel de Villena, F., †, Zou, F.†. Antipsychotic behavioral phenotypes of Collaborative Cross recombinant inbred inter-crosses (RIX). G3 (Bethesda) September 1, 2020 vol. 10 no. 9 3165-3177; https://doi.org/10.1534/g3.120.400975 *These researchers contributed equally to this work*

Lu, L., * Liu, X., * Huang, W.-K., * **Giusti-Rodríguez, P. ***, Cui, J., Zhang, S., Xu, W., * Wen, Z., Ma, S., Rosen, J. D., Xu, Z., Bartels, C., Kawagushi, R., Hu, M., Scacheri, P., Rong, Z., Li, Y., Sullivan, P. F., # Song, H., # Ming, G-L, # Li, Y., # Jin, F. #. Robust Hi-C maps of enhancer-promoter interactions reveal the function of non-coding genome in neural development and diseases. *Molecular Cell. 79, 1–14 August 6, 2020. https://doi.org/10.1016/j.molcel.2020.06.007 *These researchers contributed equally to this work*

Halvorsen, M., Huh, R., Oskolkov, N., Wen, J., Netotea, S., **Giusti-Rodriguez, P.**, Karlsson, Robert, Bryois, J., Nystedt, B., Ameur, A., Kähler, A. K., Ancalade, N., Farrell, M., Crowley, J. J., Li, Y., Magnusson, P. K. E., Gyllensten, U., Hultman, C. M., Sullivan, P. F., Szatkiewicz, J. P. Increased burden of ultra-rare structural variants localizing to boundaries of topologically associated domains in schizophrenia. *Nat Commun* 11, 1842 (2020). https://doi.org/10.1038/s41467-020-15707-w

Giusti-Rodríguez, P. *, Lu, L. *, Yang, Y. *, Crowley, C. A., Liu, X., Juric, I, Martin, J. S., Abnousi, A., Allred S. C., Ancalade, Bray, N. J., Breen, G., Bryois, J N., Bulik, C. M., Crowley, J. J., Guintivano, J., Jansen, P. R., Jurjus, J. G., Li, Y., Mahajan, G., Marzi, S., Mill, J., O'Donovan , M. C., Overholser, J. C., Owen, M. J., Pardiñas, A. F., Pochareddy, S., Posthuma, D., Rajkowska, G., Santpere G., Savage, J. E., Sestan, N., Shin, Y., Stockmeier, C. A., Walters, J. T. R., Yao, S., Bipolar Disorder Working Group of the Psychiatric Genomics Consortium, Eating Disorders Working Group of the Psychiatric Genomics Consortium, Crawford, G. E., Jin, F., Hu, M., Li, Y., Sullivan, P. F.. Using three-dimensional regulatory chromatin interactions from adult and fetal cortex to interpret genetic results for psychiatric disorders and cognitive traits. *Under review.* Posted on *bioRxiv.* https://doi.org/10.1101/406330 *These researchers contributed equally to this work*

Zhou, X., Chen, Y., Mok, K. Y., Kwok, T. C. Y., Mok, V. C. T., Guo, Q., Ip, F.C., Chen, Y., Mullapudi, N., Alzheimer's Disease Neuroimaging Initiative, **Giusti-Rodríguez, P**., Sullivan, P. F., Hardy, J., Fu, A. M. Y., Li, Y., Ip. N. Y. Non-coding variability at the APOE locus contributes to the Alzheimer's risk. *Nat Comm. 2019 Jul 25;10(1):3310. doi: 10.1038/s41467-019-10945-z.*

Watson, H. J., Yilmaz, Z., Thornton, L. M., Hübel, C., Coleman, J. R., Bryois, J., Hinney, A., Gaspar, H. A., Leppä, V., Mattheisen, M., Medland, S., Ripke, S., Yao, S., **Giusti-Rodrìguez, P**., Anorexia Nervosa Genetics Initiative, Gordon, S., Grove, J., Henders, A. K., Juréus, A., Kirk, K. M., Larsen, J. T., Parker, R., Petersen, L., Jordan, J., Kennedy, M., Montgomery, G. W., Wade, T. D., Birgegård, A., Lichtenstein, P., Norring, C., Landén, M., Martin, N. G., Mortensen, P., Sullivan, P. F., Breen, G., & Bulik, C. M. Anorexia nervosa genome-wide association study

identifies eight loci and implicates metabo-psychiatric origins. *Nat Genetics. 2019 Aug;51(8):1207-1214. doi: 10.1038/s41588-019-0439-2. Epub 2019 Jul 15.*

Foulkes, A. L., Soda, T., Farrell, M., **Giusti-Rodríguez, P**., Lázaro Muñoz, G. Legal and Ethical Implications of CRISPR Applications in Psychiatry. North Carolina law review. Jul 4 2019. 97 N.C. L. REV. 1359 (2019).

Li, M., Santpere, G., Kawasawa, Y. I., Evgrafov, O. V., Gulden, F. O., Pochareddy, S., Sunkin, S. M., Li, Z., Shin, Y., Kitchen, R. R., Zhu, Y., Werling, D. M., Sousa, A. M. M., Kang, H., Pletikos, M., Choi, J., Muchnik, S., Xu, X, Wang, D., Liu, S., **Giusti-Rodríguez, P**., de Leeuw, C. A., Pardinas, A., BrainSpan Consortium[++], PsychENCODE Consortium: Developmental Subgroup, Hu, M., Jin, F., Li, Y., Owen, M., O'Donovan, M., Walters, J., Posthuma, D., Sullivan, P., Levitt, P., Weinberger, D. R., Kleinman, J. E., Geschwind, D. H., Sanders, S., Hawrylycz, M. J., State, M., Gerstein, M. B., Lein, E. S.*, Knowles, J. A., Sestan, N. Integrative Genomics of Human Brain Development. *Science*. 2018 Dec 14;362(6420). doi: 10.1126/science.aat7615.

Amiri, A., Coppola, G., Scuderi, S., Wu, F., Roychowdhury, T., Liu, F., Pochareddy, S., Shin, Y., Safi, A., Song, L., Zhu, Y., Sousa, A.M.M.; PsychENCODE Consortium, Gerstein, M., Crawford, G.E., Sestan, N., Abyzov A, Vaccarino, FM. Transcriptome and epigenome landscape of human cortical development modeled in organoids. *Science*. 2018 Dec 14;362(6420). doi: 10.1126/science.aat6720

Crowley, J. J., Szatkiewicz, J., Kähler, A. K., **Giusti-Rodríguez, P.**, Ancalade, N., Booker, J. K., Carr, J. L., Crawford, G. E., Daly, M. J., Dekker, J., Losh, M., Stockmeier, C. A., Taylor, A. K., Hatton, D., Piven, J., Sullivan, P. F. Common Variant Associations with Fragile X Syndrome. *Mol Psychiatry*. 2018 Dec 7. doi: 10.1038/s41380-018-0290-3.

Bryois, J, Garrett, M., Song, L., Safi, A., **Giusti-Rodriguez, P**., Johnson, G., Buil, A., Roussos, P., Sklar, P., Stockmeyer, C. A., Reddy, T. E., Ashley-Koch, A., Sullivan, P. F., Crawford, G. E. Evaluation of Chromatin Accessibility in Prefrontal Cortex of Schizophrenia Cases and Controls. *Nature Comm*. 2018 Aug 7;9(1):3121. doi: 10.1038/s41467-018-05379-y.

Wray, N. R., *et al.* Genome-wide association analyses identify 44 risk variants and refine the genetic architecture of major depression. *Nat Genet*. 2018 May; 50 (5): 668-681. doi: 10.1038/s41588-018-0090-3.

Skene, N.G.[†], Bryois, J.[†], Bakken, T. E., Breen, G., Crowley, J. J., Gaspar, H. A., **Giusti-Rodriguez, P.**, Miller, J. A., Muñoz-Manchado, A., O'Donovan, M. C., Owen, M. J., Pardiñas, A. F., Ryge, J., Walters, J. T. R., Zeisel, A., Linnarsson, S., Lein, E. S., Sullivan, P. F., Hjerling-Leffler, J. Genetic dissection of brain cell types underlying schizophrenia. *Nature Genetics.* 2018 Jun;50(6):825-833. doi: 10.1038/s41588-018-0129-5.

Kim, Y.*, **Giusti-Rodriguez, P.***, Crowley, J. J.*, Nonneman, R. J., Ryan, A. K., Quackenbush, C. R., Iglesias-Ussel, M. D., Lee, P. H., Sun, W., Pardo-Manuel de Villena, F., Sullivan, P. F. Comparative Genomic Evidence for the Involvement of Schizophrenia Risk Genes in Antipsychotic Effects. *Mol Psychiatry*. 2017 May 30. doi: 10.1038/mp.2017.111 **These researchers contributed equally to this work*

Srivastava, A.*, Morgan, A. P.,* Najarian, M. L.*, Kumar Sarsani, V., Sigmon, J. S., Kashfeen, A., McMullan, R. C., Williams, L. H., **Giusti-Rodríguez, P.**, Ferris, M. T., Sullivan, P. F., Hock, P., Miller, D. R., Bell, T. A., McMillan, L., Churchill, G. A., Pardo-Manuel de Villena, F. A. The Genomes of the Collaborative Cross. *Genetics*. 2017 Jun;206(2):537-556. doi: 10.1534/genetics.116.198838.

Morgan, A. P., Fu, C-P, Kao, K., Didion, J. P., Yadgary, L., Hyacinth, L., Ferris, M. T., Bell, T. A., Miller, D. R., **Giusti-Rodriguez, P.**, Nonneman, R. J., Gralinski, L. E., Attie, A. D., Churchill, G. A., Petkov, P., Sullivan, P. F., Brennan, J. R., McMillan, L., Pardo-Manuel de Villena, F. The Mouse Universal Genotyping Array: From Substrains to Subspecies. *G3* (Bethesda). 2015 Dec 18;6(2):263-79. doi: 10.1534/g3.115.022087

Schizophrenia Working Group of the Psychiatric Genomics Consortium. Biological Insights from 108 Schizophrenia-Associated Genetic Loci. *Nature.* 2014 Jul 24; 511 (7510): 421-7.

Kim, Y.[*], Xia, K.[*], Tao, R., **Giusti-Rodriguez, P.**, Vladimirov, V., van den Oord, E., Sullivan, P. F. A Meta-Analysis of Gene Expression Quantitative Trait Loci in Brain. *Translational Psychiatry* (2014) 4, e459.

Seo, J., **Giusti-Rodriguez, P.**, Zhou, Y, Rudenko, A., Cho, S., Ota, K. T., Park, C., Patzke, H., Guan, J-S, Pan, L., Madabhushi, R., Delalle, I., and Tsai, L-H. Activity-dependent p25 Generation Regulates Synaptic Depression and Aβ-induced Pathology. *Cell*. 2014 Apr 10;157(2):486-98.

Giusti-Rodríguez, P. and Sullivan, P. F. The Genomics of Schizophrenia: Update and Implications. *Journal of Clinical Investigation.* 2013 Nov 1; 123(11): 4557–4563.

Giusti-Rodríguez, P., Gao, J., Gräff, J., Rei, D., Soda, T., Tsai, L-H. Synaptic deficits are rescued in the p25/Cdk5 model of neurodegeneration by the reduction of beta-secretase (BACE1). *The Journal of Neuroscience*. 2011 Nov 2; 31(44): 15751-15756.

Kim, D., Frank, C. L., Dobbin, M. M., Tsunemoto, R. K., Tu, W., Peng, P. L., Guan, J. S., Lee, B. H., Moy, L.Y., **Giusti, P.**, Broodie, N.., Mazitschek, R., Delalle, I., Haggarty, S. J., Neve, R. L., Lu, Y., Tsai, L-H. Deregulation of HDAC1 by p25/Cdk5 in neurotoxicity. *Neuron*. 2008 Dec 10; 60(5): 803-817.

HONORS AND AWARDS

2019 ASHG Human Genetics Scholar (2019-2021)

North Coast Conference on Precision Medicine Travel Award (2017)

Mentoring Institute for Neuroscience Diversity Scholars (MINDS), class of 2017

2017 Keystone Symposia Fellow

NIMH K01 Mentored Research Scientist Development Award (2016-)

UNC-Chapel Hill Postdoc Awards for Service, Leadership & Mentoring (2013)

Developmental Neurobiology Course, Okinawa Institute of Science and Technology (2012)

The National Academies' Christine Mirzayan Science and Technology Policy Fellow (2011)

NIH F31 Predoctoral Fellowship- Ruth L. Kirschstein National Research Service Award (NRSA) National Institute of General Medical Sciences (F31GM80055-03; 2007-2010)

Society for Neuroscience, Neuroscience Scholar (2006-2009)

MARC (Minority Access to Research Careers) U*STAR fellow- NIGMS (2001-2003)

Honors Program- University of Puerto Rico- Río Piedras (2000-2003)

Dean's List- University of Puerto Rico-Río Piedras (1999-2003)

LEADERSHIP AND SERVICE

Co-founder/leader of the Latin American Genomics Consortium (2019-present)

Mentor, *Semillas del Triunfo*, mentoring program for middle school girls in Puerto Rico (2020-present)

The Postdoc Hunt: Tools and Strategies for a Smooth PhD Transition, co-chair and panelist, 2016 SACNAS National Conference (Long Beach, CA; October 13th -15th 2016)

Brain Awareness Week volunteer (2016)

NC DNA Day volunteer (2016)

Oliver Smithies Nobel Symposium, Events Committee, Chapel Hill, NC (2013-2015)

Ciencia Puerto Rico, Coordinator of Volunteer Services (2015- present)

Co-Chair Postdoctoral Association, University of North Carolina, Chapel Hill, NC (2013-2014)

Science Club for Girls**,** after-school program volunteer**,** Cambridgeport School, Cambridge, MA (2005-2007)

MENTORING

Matthew Serna, M.D., Practicing Physician (2006-2008; undergraduate research student)

Elias Cornejo, Ph.D., Assistant Professor, Randolph-Macon College (2009; HHMI Gilliam Fellow, summer undergraduate research)

Jarrad Aguirre, MD, MBA, Head of Corporate Strategy and Advocacy at Myovant Sciences (2010; HHMI Gilliam Fellow, summer undergraduate researcher).

Daniela DeCristo, B.S., graduate student in the Genetic Counseling Program at UNC-Greensboro (2013-2016; undergraduate researcher and laboratory technician)

Shadia Sekle, B.S., postbac student at the Southern Illinois University School of Medicine (2017-2020; Chancellor's Science Scholar; undergraduate researcher and laboratory technician)

Jasmine Akoto, Chancellor's Science Scholar and undergraduate at the University of North Carolina at Chapel Hill (2020-present)

TEACHING EXPERIENCE

Teaching Fellow, MCB 80: Neurobiology of Behavior, Harvard University, Cambridge, MA (2007)
Lectured in weekly discussion sessions for 10-15 undergraduate students.

PROFESSIONAL DEVELOPMENT

Statistical Methods for Functional Genomics Course (Cold Spring Harbor Laboratory, NY; 2017)

Being a Better Faculty Research Mentor training (Center for Faculty Excellence; Chapel Hill, NC; 2017)

Single Cell Genomics Day: A Practical Workshop (New York Genome Center, New York, NY; 2016)

CSAMA2016 Statistics and Computing in Genome Data Science course (Bressanone-Brixen, Italy; 2016)

PROFESSIONAL ASSOCIATIONS

American Association for the Advancement of Science (2016 – present)

International Society for Psychiatric Genetics (2013 – present)

Psychiatric Genomics Consortium (2013 – present)

American Society of Human Genetics (2019- present)

Positions within professional organizations:

Member, Schizophrenia Working Group, Psychiatric Genomics Consortium, 2013-present

Member, International Society for Psychiatric Genetics, Inclusion, Diversity, and Equity in Action Committee (2019-present)

PROFESSIONAL SERVICE

Neuroscience Scholars Program (NSP) Selection Committee (2021-2023)

Dissertation Advisory Committee, Cheynna A. Crowley, *Analysis of chromosome spatial organization data and integration with gene mapping for complex traits*, November 3, 2020.

Moderator, *Insights into Structural Variation Features in Constitutional Diseases and Cancer Genomes* session, 2020 American Society of Human Genetics Virtual Meeting, October 29, 2020.

Co-organizer, *Equity in Health and Healthcare: Considerations of Race/Ethnicity in Precision Medicine*, Health Disparities Workshop, held during the *Beyond a Million Genomes: From Discovery to Precision Health* Keystone Conference, January 23, 2020.

Planning committee member, 2018 Andrew S. Rachlin UNC Neuroscience Symposium

UNC-Chapel Hill Title IX Employee Procedure Working Group, University of North Carolina, Chapel Hill, NC (October 2015-October 2016; postdoctoral representative)

Department of Genetics Specific Aims Club, University of North Carolina, Chapel Hill, NC (August 2017-present)

SEMINARS AND CONFERENCES

"Dissecting the Genetics of Psychiatric Disorders Using Hi-C and Complimentary Genomics Approaches", talk was part of *Moving the investigation of the psychopathology spectrum from genetics to multi-omics* symposium at the 2020 World Congress of Psychiatric Genetics (October 19, 2020; virtual session)

"Disección de hallazgos genéticos de trastornos psiquiátricos utilizando la genómica funcional", NIH-ENDURE neuroscience research training program (NeuroID), May 5th, 2020 (in-person seminar originally scheduled for 10/17/2020; switched to virtual seminar)

Career Roundtable panelist, held during the *Beyond a Million Genomes: From Discovery to Precision Health* Keystone Conference, January 22, 2020.

"Dissecting the genetics of psychiatric disorders using functional genomics approaches", Berlin Institute for Medical Systems Biology, Max-Delbrück-Center for Molecular Medicine, January 14, 2020

"Dissecting the genetics of psychiatric disorders using functional genomics approaches", Geisinger Health, December 4th, 2019.

"Dissecting the genetics of psychiatric disorders using functional genomics approaches", Menninger Department of Psychiatry and Behavioral Sciences, Baylor School of Medicine, October 15, 2019

"Dissecting the genetics of psychiatric disorders using functional genomics", Lieber Institute for Brain Development, March 12, 2019

"Dissecting the genetics of psychiatric disorders using functional genomics", Department of Psychiatry, Johns Hopkins School of Medicine, January 30, 2019.

"Dissecting the genetics of psychiatric disorders using functional genomics", Center for Neuroscience, University of California-Davis, January 14, 2019

2018 Andrew S. Rachlin UNC Neuroscience Symposium (speaker, 10/11/2018)

Keystone Symposia Scientific Advisory Board Meeting, seminar, June 17, 2017

Lunch & Learn speaker, Society for the Advancement of Chicanos and Native Americans in Science (SACNAS), University of North Carolina at Chapel Hill, September 26, 2018

Science Policy Advocacy Group at the University of North Carolina at Chapel Hill, "Applying to Opportunities in Science Policy", June 13th, 2018

Yale Ciencia Academy for Professional Development, Conversations with Scientists online panel series, "Getting Funded", July 7, 2017

2017 Mentoring Institute for Neuroscience Diversity Scholars (MINDS) workshop, seminar, September 15, 2017.

The Postdoc Hunt: Tools and Strategies for a Smooth PhD Transition, co-chair and panelist, 2016 SACNAS National Conference (Long Beach, CA; October 13th -15th 2016)

Yale Ciencia Academy for Professional Development, Conversations with Scientists online panel series, “Securing a Postdoc”, March 10, 2016