Eduardo Pérez, PhD
Profesor Investigador
Centro de Genética y Genómica
Facultad de Medicina Clínica Alemana
Universidad del Desarrollo
Avenida Las Condes 12461
eduardoperez@udd.cl / +56 950731971

August 06, 2021

To whom it may concern,

My work focus on the genetics underlying epilepsy and neurodevelopmental disorders. We study which genetic variants can cause disease and how they can drive disease prognosis, comorbidity, and drug response. Specifically, my research aims to:

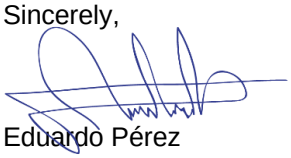
1) Unveil the effect of genetic variation in epilepsy patients. We study common, rare and structural genetic variation in cases and controls collected from an international collaborative network. (PMID: 30682224; PMID: 30664068; PMID: 29473046; PMID: 28756411)

2) Develop tools for variant interpretation. Following genetic testing, distinguishing between disease-causing and benign variation is challenging. We develop visual and statistical methods for variant interpretation by integrating large scale data derived from patients and the general population. (http://simple-clinvar.broadinstitute.org and http://per.broadinstitute.org).

3) Develop a collaborative Latin American effort to study epilepsy and neurodevelopmental disorders. South American countries have a higher prevalence of epilepsy, yet they are underrepresented in current genetic studies. In this regard, I have been actively involved in the genetic characterization of Mapuche individuals (PMID: 30765821), Chilean admixed populations (PMID: 30692554) and Latin populations with Parkinson disease (LARGE-PD).

Overall, I have been growing a research profile focusing on interdisciplinary genomics and data science to bridge novel genetic knowledge with the clinical practice. We aim to integrate large genetic, clinical, and biological data sets to improve the prediction of genetic variant effects on patient outcomes – paving the way for personalized medicine with a particular focus on Latin American populations.

Sincerely,



Eduardo Pérez

EDUARDO ESTEBAN PÉREZ PALMA

Email: eduardoperez@udd.cl / Telephone: +56 950731971
Languages: Spanish (Native) / English (C1)
Profiles: Twitter / LinkedIn / Universidad del Desarrollo

ACADEMIC FORMATION

2011 - 2017	Ph.D. in molecular biosciences, Universidad Andrés Bello, Santiago, Chile.
2005 - 2011	Bioengineering, Universidad de Concepción, Concepción, Chile.

WORK EXPERIENCE

2021 - Present	Research Professor. Centro de Genética y Genómica (CGG), Facultad de Medicina, Universidad del Desarrollo, Santiago, Chile
2019 - 2020	Research Associate. Genomic Medicine Institute and Epilepsy Institute of the Cleveland Clinic. Cleveland, Ohio. USA.
2017 - 2019	Postdoctoral Fellow: Dravet Foundation research grant: A novel system to evaluate *SCN1A* variant pathogenicity. Cologne Center for Genomics, Köln, Germany.
2013 - 2016	Computational Biologist / Data analysis: Chilean Center for Investigation in Priority Areas (FONDAP) 15090007: Center for Genome Regulation. Santiago, Chile.

GRANTS AND FELLOWSHIPS

2015 - 2016	German Academic Exchange Service (DAAD). Short Term Grant internship at the Cologne Center for Genomics, University of Cologne. ID Number: 57130097.
2012 - 2015	National Research Commission of Science and Technology (CONICYT) grants for national and international scientific conferences.
2011 - 2015	CONICYT National Doctoral Grant, Advance Human Capital Formation Program. Full Fellowship. ID Number: 21110297.

RESEARCH EXPERIENCE

Genetic platforms	Microarray genotyping, whole exome, whole genome, and gene panel sequencing as well as structural variation analysis. Rare and common variant analysis.
Programing skills	Perl, Bash, AWK and R. Cloud computing with gcloud services and web application development with Shiny framework and CSS.

ONLINE SCIENTIFIC TOOLS DEVELOPMENT

2019	Simple ClinVar. Fast and friendly exploration of the genetic data contained in ClinVar database: http://simple-clinvar.broadinstitute.org.
2019	PER Viewer. Explore pathogenic variant enriched regions (PERs) across genes and gene families: http://per.broadinstitute.org
2018	MISCAST. MIssense variant to protein StruCture Analysis web SuiTe: http://miscast.broadinstitute.org/

PUBLICATIONS

Complete list	https://www.ncbi.nlm.nih.gov/myncbi/eduardo.perez.1/bibliography/public/
ORCID	https://orcid.org/0000-0003-0546-5141

PUBLICATIONS **(*Shared first author)**

2021 Marie Gramm, **Eduardo Pérez-Palma**, Sarah Schumacher-Bass, Jarrod Dalton, Costin Leu, Daniel Blankenberg and Dennis Lal. SimText: A text mining framework for interactive analysis and visualization of similarities among bio-medical entities. PMID: 34037702.

2021 Arthur Stefanski, Costin Leu, Yamile Calle-Lopez, **Eduardo Pérez-Palma**, Elia Pestana-Knight, Dennis Lal. Clinical sequencing in Epilepsy, Autism Spectrum Disorder and Intellectual Disability: A systematic review and meta-analysis. Epilepsia. PMID: 33200402 .

2021 Elif Irem Sarihan, **Eduardo Pérez-Palma**, Lisa-Marie Niestroj, Marilyn Seyfi, Miguel Inca-Martinez, Dennis Lal, Ignacio F. Mata on behalf of the Latin American Research Consortium on the Genetics of Parkinson's Disease (LARGE-PD). Genome-Wide Analysis of Copy Number Variation in Latin American Parkinson's Disease Patients. Movements Disorders. PMID: 33150996.

2020 Sumaiya Iqbal, **Eduardo Perez-Palma**, Jakob Berg Jespersen, Patrick May, David Hokszaf, Henrike O. Heyne, Shehab S. Ahmed, Zaara T. Rifat, M. Sohel Rahman, Kasper Lage, Aarno Palotie, Jeffrey R. Cottrell, Florence F. Wagner, Mark J. Daly, Arthur J. Campbell, and Dennis Lal. Comprehensive characterization of amino acid positions in protein structures reveals molecular effect of missense variants. Proceedings of the National Academy of Sciences (PNAS). PMID: 33106425.

2020 Kimberly Goodspeed*, **Eduardo Pérez-Palma***, Sumaiya Iqbal, Dominique Cooper, Annalisa Scimemi, Arthur Stefanski, Katrine M. Johannesen, Scott Demarest, Katherine Helbig, Jingqiong Kang, Catherine Brownsteint, Chan Lim Byung, Ingo Helbig, Emily De Los Reyes, Dianalee McKnight, Vincenzo Crunelli, Arthur J. Campbell, Rikke S. Møller, Amber Freed, Dennis Lal. Current knowledge of SLC6A1-related disorders: GABA transporter (GAT1) mediated disorders. Brain Communications. PMID: 33241211.

2020 Marie Gramm, Costin Leu, **Eduardo Pérez-Palma**, Lisa Ferguson, Lara Jehi, Mark J. Daly, Imad M. Najm, Robyn M. Busch, Dennis Lal. Polygenic risk heterogeneity among focal epilepsies. Epilepsia. PMID: 33090489.

2020 Lisa-Marie Niestroj, **Eduardo Pérez-Palma**, Daniel P. Howrigan, Elmo Saarentaus, Peter Nürnberg, Remi Stevelink, Mark J. Daly, Aarno Palotie, Dennis Lal, Epi25 Collaborative. Epilepsy subtype specific copy number burden observed in a genome-wide study of 17,458 subjects. Brain. PMID: 32568404.

2020 Henrike O. Heyne, David Baez-Nieto, Sumaiya Iqbal, Duncan Palmer, Andreas Brunklaus, Patrick May, the Epi25 Collaborative, Katrine M. Johannesen, Stephan Lauxmann, Johannes R. Lemke, Rikke S. Møller, **Eduardo Pérez-Palma**, Ute Scholl, Steffen Syrbe, Holger Lerche, Dennis Lal, Arthur J. Campbell, Hao-Ran Wang, Jen Pan, Mark J. Daly. Predicting Functional Effects of Missense Variants in Voltage-Gated Sodium and Calcium Channels. *Science Translational Research*. PMID: 32801145.

2020 Sumaiya Iqbal, David Hoksza, **Eduardo Pérez-Palma**, Jakob Berg Jespersen, Shehab Sarar Ahmed, Zaara Tasnim Rifat, Henrike O. Heyne, M. Sohel Rahman, Je_rey R. Cottrell, Florence F. Wagner, Patrick May, Mark J. Daly, Arthur J. Campbell and Dennis Lal. MISCAST: Missense variant to proteIn StruCture Analysis web SuiTe. Nucleic Acids Research. PMID: 32402084.

2020 Rochtus, Anne; Goldstein, Richard; Holm, Ingrid; Brownstein, Catherine; **Pérez-Palma, Eduardo**; Haynes, Robin; Lal, Dennis; Poduri, Annapurna. The role of sodium channels in sudden unexpected death in pediatrics. Molecular Genetics & Genomic Medicine. PMID: 32449611.

2020 Dennis Lal, Patrick May, **Eduardo Perez-Palma**, Kaitlin E. Samocha, Jack A. Kosmicki, Elise B. Robinson, Rikke S. Møller, Roland Krause, Peter Nürnberg, Sarah Weckhuysen, Peter De Jonghe, Renzo Guerrini, Lisa M. Niestroj, Juliana Du, Carla Marini, EuroEPINOMICS-RES Consortium, James S. Ware, Mitja Kurki, Padhraig Gormley, Sha Tang, Sitao Wu, Saskia Biskup, Annapurna Poduri, Bernd A. Neubauer, Bobby P. C. Koeleman, Katherine L. Helbig, Yvonne G.

Weber, Ingo Helbig, Amit R. Majithia, Aarno Palotie, Mark J. Daly. Gene family information facilitates variant interpretation and identification of disease-associated genes in neurodevelopmental disorders. *Genome Medicine*. PMID: 32183904.

2020 Javier A. López-Rivera, **Eduardo Pérez-Palma**, Joseph Symonds, Sameer Zuberi, Andreas Brunklaus, Rikke S. Møller, Dennis Lal. Incidence estimation of monogenic disorders caused by *de novo* variants. Brain. PMID 32168371.

2020 **Eduardo Pérez-Palma**, Patrick May, Sumaiya Iqbal, Lisa-Marie Niestroj, Juanjiangmeng Du, Henrike Heyne, Peter Nürnberg, Aarno Palotie, Mark Daly and Dennis Lal. Identification of pathogenic variant enriched regions across genes and gene families. *Genome Research.* PMID: 31871067.

2019 Andreas Brunklaus, Costin Leu, Marie Gramm, **Eduardo Pérez-Palma**, Sumaiya Iqbal, Dennis Lal. Time to move beyond genetics towards biomedical data-driven translational genomic research in severe paediatric epilepsies. European Journal of Paediatric Neurology. PMID: 31924506.

2019 Andreas Brunklaus, Stephanie Schorge, Alexander Smith, Ismael Ghanty, Kirsty Stewart, Sarah Gardiner, Juliana Du, **Eduardo Pérez-Palma**, Joe Symonds, Abby Collier, Dennis Lal, Sameer Zuberi. SCN1A variants from bench to bedside – improved clinical prediction from functional characterization. *Human Mutation*. PMID: 3178225.

2019 **Eduardo Pérez-Palma**, Bernabé I. Bustos, Dennis Lal, Stephan Buch, Lorena Azocar, Mohammad Toliat, Wolfgang Lieb, Andre Franke, Sebastian Hinz, Greta Burmeister, Witigo von Shönfels, Clemens Schafmayer, Henry Völzke, Uwe Völker, Georg Homuth, Markus M. Lerch, Rodrigo A. Gutiérrez, Jochen Hampe, Peter Nürnberg, Juan Francisco Miquel and Giancarlo V. De Ferrari. Copy number variation affecting lipid metabolism genes are associated with gallstones disease in Men. *European Journal of Human Genetics (EJHG)*. PMID: 31485028.

2019 **Eduardo Pérez-Palma**, Marie Gramm, Patrick May, Peter Nürnberg and Dennis Lal. Simple-ClinVar: an interactive online tool to explore and retrieve gene and disease variants aggregated in ClinVar database. *Nucleic Acids Research.* PMID: 31114901.

2019 Lisa-Marie Niestroj, Patrick May, Mykyta Artomov, Katja Kobow, Roland Coras, **Eduardo Pérez-Palma**, Janine Altmüller, Holger Thiele, Peter Nürnberg, Costin Leu, Aarno Palotie, Mark J. Daly, Karl Martin Klein, Rudi Beschorner, Yvonne G. Weber, Ingmar Blümcke, Dennis Lal. Assessment of genetic variant burden in epilepsy-associated brain lesions. *European Journal of Human Genetics (EJHG)*. PMID: 31358956.

2019 Lerche H, Berkovic SF, Lowenstein DH; **EuroEPINOMICS-CoGIE** Consortium; EpiPGX Consortium; Epi4K Consortium/Epilepsy Phenome/Genome Project. Intestinal-Cell Kinase and Juvenile Myoclonic Epilepsy. *N Engl J Med.* PMID: 30995385.

2019 Juanjiangmeng Du, Monica Sudarsanam, **Eduardo Pérez-Palma**, Andrea Ganna, Laurent Francioli, Sumaiya Iqbal, Lisa-Marie Niestroj, Costin Leu, Ben Weisburd, Tim Poterba, Peter Nürnberg, Mark J. Daly, Aarno Palotie, Patrick May and Dennis Lal. Variant Score Ranker – a web application for intuitive missense variant prioritization. *Bioinformatics.* PMID: 31086968.

2019 Elena A. Vidal*, Tomás C. Moyano*, Bernabé I. Bustos*, **Eduardo Pérez-Palma*,** Carol Moraga*, Alejandro Montecinos, Lorena Azocar, Daniela C Soto, Eleodoro Riveras, Mabel Vidal, Alex Di Genova, Klaus Puschel, Peter Nuernberg, Stephan Buch, Jochen Hampe, Miguel L Allende, Veronica Cambiazo, Mauricio Gonzalez, Christian Hodar, Martin Montecino, Claudia Munoz-Espinoza, Ariel Orellana, Angelica Reyes-Jara, Dante Travisany, Paula Vizoso, Mauricio Moraga, Susana Eyheramendy, Alejandro Maass, Giancarlo V De Ferrari, Juan Francisco Miquel, Rodrigo A Gutierrez. Whole Genome Sequence of Mapuche-Huilliche Native Americans. *Scientific Reports*. PMID: 30765821.

2019 Bernabé I Bustos, **Eduardo Pérez-Palma**, Stephan Buch, Lorena Azócar, Eleodoro Rivera, Mohammad Toilat, Jochen Hampe, Peter Nürnberg, Rodrigo A Gutiérrez, Giancarlo V De Ferrari and Juan Francisco Miquel. Common variants in ABCG8 and TRAF3 genes confer risk for

gallstone disease and gallbladder cancer in admixed Latinos with Mapuche Native American ancestry. *Scientific Reports*. PMID: 30692554.

2019 McKenna Kelly, Meredith Park, Ivana Mihalek, Anne Rochtus, Marie Gramm, **Eduardo Pérez-Palma**, Erika Takle Axeen, Christina Y. Hung, Heather Olson, Lindsay Swanson, Irina Anselm, Lauren C. Briere, Frances A. High, David A. Sweetser, Undiagnosed Diseases Network (UDN), Saima Kayani, Molly Snyder, Sophie Calvert, Ingrid E. Scheffer, Edward Yang, Jeff L. Waugh, Dennis Lal, Olaf Bodamer,Annapurna Poduri. Spectrum of neurodevelopmental disease associated with the GNAO1 GTP-binding region. *Epilepsia.* PMID: 30682224*.*

2019 Snezana Maljevic, Rikke S. Moller, Christopher A. Reid, **Eduardo Pérez-Palma**, Dennis Lal, Patrick May, and Holger Lerche. Spectrum of GABAA receptor variants in epilepsy. *Curr Opin Neurol*. PMID: 30664068.

2018 **Pérez-Palma E**, Saarentaus E, Ravoet M, De Ferrari GV, Nürnberg P, Isidor B, Neubauer BA, Lal D. Duplications at 19q13.33 in patients with neurodevelopmental disorders. *Neurol. Genet*. PMID: 29473046.

2017 **Pérez-Palma E**, Helbig I, Klein KM, Anttila V, Horn H, Reinthaler EM, Gormley P, Ganna A, Byrnes A, Pernhorst K, Toliat MR, Saarentaus E, Howrigan DP, Hoffman P, Miquel JF, De Ferrari GV, Nürnberg P, Lerche H, Zimprich F, Neubauer BA, Becker AJ, Rosenow F, Perucca E, Zara F, Weber YG, Lal D. Heterogeneous Contribution of Microdeletions in the Development of Common Generalized and Focal Epilepsies. *J Med Genet*. Sep;54(9):598-606. PMID: 28756411.

2016 **Pérez-Palma E***, Andrade V*, Caracci MO, Bustos BI, Villaman C, Medina MA, Ávila ME, Ugarte GD, De Ferrari GV. Early Transcriptional Changes Induced by Wnt/*β*-Catenin Signaling in Hippocampal Neurons. *Neural Plasticity*. PMID: 28116168.

2014 **Pérez-Palma E***, Bustos BI*, Villamán CF, Alarcón MA, Avila ME, Ugarte GD, Reyes AE, Opazo C, De Ferrari GV; Alzheimer's Disease Neuroimaging Initiative; NIA-LOAD/NCRAD Family Study Group. Overrepresentation of Glutamate Signaling in Alzheimer's Disease: Network-Based Pathway Enrichment using Meta-analysis of Genome-Wide Association Studies. *PLoS One*. PMID: 24755620.

2013 De Ferrari GV, Avila ME, Medina MA, **Perez-Palma E**, Bustos BI, Alarcon MA. Wnt/β-catenin signaling in Alzheimer's disease. *CNS Neurol. Disord. Drug Targets*. PMID: 24365184.

2013 Alarcón MA, Medina MA, Hu Q, Avila ME, Bustos BI, **Pérez-Palma E**, Peralta A, Salazar P, Ugarte GD, Reyes AE, Martin GM, Opazo C, Moon RT, De Ferrari GV. A novel functional low-density lipoprotein receptor-related protein 6 gene alternative splice variant is associated with Alzheimer's disease. *Neurobiol. Aging*. PMID: 23218566.

OTHER PUBLICATIONS, PUBLICATIONS IN REVIEW AND PREPRINTS

2021 Andreas Brunklaus*, **Eduardo Pérez-Palma***, Ismael Ghanty, Stephanie Schorge, Ji Xinge, Joseph Symonds, Renzo Guerrini, Rima Nabbout, Ingrid Scheffer, Michael Kattan, Sameer M Zuberi, Dennis Lal. The Dravet Prediction tool: Predicting patient's phenotypic outcome by combined modeling of *SCN1A* genetic effects with clinical features. In revision.

2021 Javier A. López-Rivera, Victoria Smuk, Arthur Stefanski, **Eduardo Pérez-Palma**, Costin Leu, Robyn Busch, Lara Jehi, Deborah Vegh, Gaelle Nasr, Imad Najm, Ingmar Blümcke and Dennis Lal. Prevalence and incidence of epilepsy surgery candidates and major epilepsy-associated brain lesions. In revision.

2021 David Baez-Nieto, Andrew Allen, Seth Akers-Campbell, Lingling Yang, Amaury Pupo, Young-Cheul Shin, Gulio Genovese, **Eduardo Pérez-Palma**, Diane Lipscombe, Maofu Liao, Dennis Lal, and Jen Q. Pan. Rare missense variants of *CACNA1I* from schizophrenia patients of a Swedish cohort preferentially increase TRN neurons excitability. In revision.

2019 National organization of rare diseases, NORD. Summary report (Rol: Autor): *SLC6A1* Epileptic Encephalopathy. https://rarediseases.org/rare-diseases/slc6a1-epileptic-encephalopathy/. Non peer reviewed.

INTERNATIONAL WORKSHOPS LECTURES

2020 BroadE Workshop: Missense Variants to Protein Sequence and Structure. Broad Institute of MIT and Harvard. January 24, 2020.

2019 Computational Genetics, and Application in Variant Interpretation. Cologne Center for Genomics, University of Cologne. December 19th-21st 2019.

2019 ISIA 2019. Taller de Bioinformática. Instituto Nacional de Ciencias Neurológicas. Lima, Perú. 16-19 September 2019.

2018 Basic Coding, Computational Genetics, and Applications in Medical Research. Cologne Center for Genomics, University of Cologne. December 19th-21st 2018.

2018 Hail – An Open-Source, Scalable Framework for Exploring and Analyzing Very Large Genomic Data. Cologne Center for Genomics and Broad Institute of Harvard and M. I. T. April 10-11. University of Cologne.

GRANTS

2020 Subsidy for Insertion in the Academy. *"Epilepsy Genetics: Characterization of common and rare variants in Chilean Patients with epilepsy and developmental epileptic encephalopathies*". Role: Principal Investigator. Funding agency: Chilean National research and development Agency (ANID).

2020 Action Potential Grant. "*Integrating clinical and genetic variables to model SCN2A variant pathogenicity and outcomes*". Role: Principal Investigator. Funding agency: FamilieSCN2A Foundation, USA.

2020 Clinical Research 2020 grant. "Expanding genomic analyses in pediatric refractory epilepsy patients with unknown cause". Role: Co-Investigator. Funding agency: Alemana Clinic, Santiago de Chile, Chile.

2017 Research grant to Dr. Dennis Lal. "A novel system to evaluate *SCN1A* variant pathogenicity". Role: Postdoctoral Fellow. Funding agency: Dravet Syndrome Foundation.