

Constanza Paulina Silva Gallardo

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SUMMARY

Ph.D. Candidate in the Department of Biobehavioral Health at The Pennsylvania State University. Interested in the behavioral genomics of tobacco use and co-use with alcohol and marijuana, in animal models and humans. My past research has focused on the effects of nicotine exposure during adolescence and its impact on alcohol consumption and gene expression. Currently, I am studying the effect of smoking reduced nicotine-content cigarettes (Spectrum) on genomic marks, and their associations with craving and withdrawal symptom relief. I am also interested in using statistical methods to examine sex differences in the association between cigarette smoking onset and marijuana use across adolescence. During my Ph.D., I have been awarded two highly competitive pre-doctoral training grants (NIH T32 matching funds), the first in biomedical Big Data (B2D2K), and the second in methodology and prevention (PAMT). I have laboratory, genomic data analysis, teaching, and science communication experience. Additionally, I am fluent in both Spanish and English.

EDUCATION

- 2015-2021** **Biobehavioral Health Ph.D. Candidate** (*Expected graduation May-June 2021*).
Department of Biobehavioral Health, College of Health and Human Development, The Pennsylvania State University.
Committee: Dr. Helen Kamens (Chair), Dr. David Vandenberg, Dr. Steve Branstetter, and Dr. Djiang Liu.
- 2015-2018** **M.S. in Biobehavioral Health.**
Department of Biobehavioral Health, College of Health and Human Development, The Pennsylvania State University.
Title: *The influence of adolescent nicotine exposure on ethanol intake and brain gene expression.*
- 2018** **Certificate in Applied Bioinformatics.**
Department of Biochemistry and Molecular Biology, Eberly College of Science, The Pennsylvania State University.
- 2014** **Professional degree in Biological Anthropology.**
Department of Anthropology, University of Chile, Santiago, Chile.
Title: *Alcohol intake patterns and genetic variants involved in tolerance to this substance in undergraduate students.*
- 2008-2012** **B.S. in Biological Anthropology.**
Department of Anthropology, University of Chile, Santiago, Chile.

RESEARCH INTERESTS

Genomics, addiction, behavior, adolescence, nicotine, co-use of addictive substances, and prevention.

PUBLICATIONS

1. **Silva CP** & Kamens HM (In Press). *Cigarette smoke-induced alterations in blood: a review of research on DNA methylation and gene expression*. Exp Clin Psychopharmacol; doi: 10.1037/pha0000382.
2. Kamens, H.M., **Silva, C.P.**, Nye, R.T., Miller, C.N., Singh, N., Spiko, J., Trushin, N., Sun, D., Branstetter, S.A., Muscat, J., Richie, J.P., & Foulds, J. (2020) *Pharmacokinetic profile of Spectrum reduced nicotine cigarettes*. Nicotine Tob Res, 22(2):273-279; doi: 10.1093/ntr/ntz045.
3. **Silva CP**, Horton WJ, Caruso MJ, Sebastian A, Klein LC, Albert I. (2018) *The influence of adolescent nicotine exposure on ethanol intake and brain gene expression*. PLOS ONE 13(6): e0198935; doi: 10.1371/journal.pone.0198935.
4. Kamens HM, **Silva CP**, Peck C, Miller CN. (2018) *Varenicline modulates ethanol and saccharin consumption in adolescent male and female C57BL/6J mice*. Brain Res Bull, 138:20-25; doi: 10.1016/j.brainresbull.2017.07.020.
5. Kamens HM, **Silva CP**, McCarthy RD, Cox RJ, Ehringer MA. (2017) *No evidence of a role of the $\beta 4$ subunit of the nicotinic acetylcholine receptor in alcohol-related behaviors*. BMC Res Notes, 10(1):151; doi: 10.1186/s13104-017-2470-7.
6. Póntigo F, **Silva CP**, Moraga M, Flores SV. (2015) *Streptococcus massiliensis in the human mouth: a phylogenetic approach for the inference of bacterial habitats*. Genet Mol Res. 2015 Dec 29;14(4):19184-90; doi: 10.4238/2015.
7. **Silva CP**, Flores SV. *Alcohol consumption patterns and genotypes determining alcohol tolerance in Chilean university students*. (2015) Rev. Méd. Chile vol.143 no.6 Santiago Jun. 2015, ISSN 0034-9887; doi: 10.4067/S0034-98872015000600003.

MANUSCRIPTS SUBMITTED

Kamens HM, Dziak JJ, Horton WJ, **Silva CP**, Sebastian A, Albert I, and Li R *Varenicline Reduces Ethanol Consumption in Male C57BL/6J Mice: Potential Gene Expression Mechanism* (submitted to *PLOS ONE*, May 2020).

MANUSCRIPTS IN PREPARATION

Constanza P. Silva, John J. Dziak, Runze Li, and Helen M. Kamens. *Gene expression alterations associated with smoking SPECTRUM reduced nicotine content cigarettes*.

Constanza P. Silva, John J. Dziak, Helen M. Kamens, and Ashley Linden-Carmichael. *The effects of earlier cigarette smoking onset on marijuana use frequency among Chilean adolescents*.

INVITED PRESENTATIONS

Constanza P. Silva (August, 2020). *"Genetics and the impact on public health"* (on-line). Invited lecturer to course "Cell and Genetics", Anthropology, Universidad de Chile, Santiago, Chile.

Constanza P. Silva (June, 2020). *"Discussion: Ethical practices of research in indigenous communities"* (on-line). Diaguita Indigenous community (Mapochogasta), Santiago, Chile.

Constanza P. Silva. (January, 2020). "*Consecuencias biológicas de la exposición a la nicotina e implicancias para políticas públicas*". Society and Health Research Center (CISS), Universidad Mayor, Santiago, Chile.

Constanza P. Silva and Sergio Flores Carrasco (September, 2013). "*Alcohol intake patterns and genetic variants involved in tolerance among undergraduate students from Santiago, Chile*". Mental Health and Community Center (COSAM), Puente Alto, Santiago, Chile.

ACADEMIC PRESENTATIONS

Constanza P. Silva. (April, 2019). "*Biological Consequences of Reduced Nicotine-Content Cigarettes and Implications for Regulation*". 4th Annual Founder's Endowment for Excellence and Innovation Research Day. Department of Biobehavioral Health, College of Health and Human Development, The Pennsylvania State University.

Constanza P. Silva. (April, 2019). "*Biological Consequences of Reduced Nicotine-Content Cigarettes and Implications for Regulation*". Biomedical Big Data (B2D2K) to Knowledge Retreat, Huck Institutes of the Life Sciences, The Pennsylvania State University.

Constanza P. Silva. (April, 2018). "*The effects of adolescent nicotine exposure on ethanol intake and brain gene expression*". Biomedical Big Data (B2D2K) to Knowledge Retreat, Huck Institutes of the Life Sciences, The Pennsylvania State University.

Constanza P. Silva and Sergio Flores Carrasco (August, 2013). "*Alcohol intake patterns and genetic variants involved in tolerance among undergraduate students from Santiago, Chile*". IV Conference on Research in the Department of Anthropology 2013, University of Chile, Santiago, Chile.

INTERNATIONAL AND NATIONAL CONFERENCES

Constanza P Silva and Helen M Kamens (March, 2020). "*Genomic responses in whole-blood following smoking a high, medium or low nicotine-content Spectrum cigarette*". 26th Annual Meeting - Society for Research on Nicotine and Tobacco, New Orleans, Louisiana, United States. (Poster)

Helen M Kamens, **Constanza P Silva**, Russell T Nye, Carley N Miller, Steven A Branstetter, Joshua E Muscat, John P Richie, and Jonathan Foulds. (February, 2019). "*Pharmacokinetic Profile of Spectrum Reduced Nicotine Cigarettes*". Annual Meeting - Society for Research on Nicotine and Tobacco, San Francisco, California, United States. (Poster)

Miller, C.N., **Silva, C.**, Peck, C., & Kamens, H.M (April 2017). "*The nicotinic acetylcholine receptor partial agonist varenicline alters ethanol consumption and adolescent C57BL/6J mice*". Pennsylvania State University Undergraduate Research Exhibition, University Park, Pennsylvania, United States. (Poster)

C.P. Silva, M.J. Caruso, W.J. Horton, H.M. Kamens. (May, 2016). "*The Effect of Nicotine Exposure on Ethanol Consumption and Gene Expression: A WGCNA Analysis*". 18th Annual Genes, Brain, and Behavior Meeting of IBANGS Bar Harbor, Maine, United States. (Poster)

C.P. Silva, M.J. Caruso, W.J. Horton, H.M. Kamens. (April, 2016). "*The Effect of Nicotine Exposure on Ethanol Consumption and Gene Expression: A WGCNA Analysis*". 2nd Annual Addiction Symposium, Hershey Medical Center, Pennsylvania, United States. (Poster)

Silva Gallardo C and Flores Carrasco S. (March, 2015). "*Genetic variants and alcohol intake patterns in university population in Santiago of Chile*". 84th Annual Meeting of American Association of Physical Anthropologists (AAPA), St. Louis, Missouri, United States. (Poster)

Silva Gallardo C and Flores Carrasco S. (October, 2014). “*Patrones de consumo y variantes genéticas involucradas en la tolerancia al alcohol en población universitaria de Santiago de Chile / Alcohol intake patterns and genetic variants involved in tolerance to this substance in undergraduate students from Santiago, Chile*”. Latin American Association of Biological Anthropology (ALAB), Santiago, Chile. (Poster)

Pontigo Arancibia F, **Silva Gallardo C** and Flores Carrasco S. (October, 2013). “*Genetic Analysis of oral microbiome and diet inference*”. (2013) XI National Conference of Biological Anthropology, Buenos Aires, Argentina. (Poster)

Pontigo Arancibia F, **Silva Gallardo C** and Flores Carrasco S. (October, 2012). “*Streptococcus massiliensis in the human oral cavity: a phylogenetic approach to the search for bacterial species*”. XV Latin American Congress of Genetics, XLI Argentine Congress of Genetics, XLV Congress of the Genetics Society of Chile and II SAG-Coast Regional Meeting. (Poster)

FELLOWSHIPS AND TRAINING GRANTS

2019-2021 **The Prevention and Methodology Training Program awardee (PAMT; T32 DA017629, \$92,000)**

Understanding drug dependence is highly complex and requires researchers with the ability to communicate effectively between different disciplines. Therefore, to expand my skills, I applied for this training grant. This scholarship is highly competitive, and the selection process is based on a research proposal in the area of substance use, publications record, and having an excellent curriculum vitae. Obtaining this scholarship guarantees training in methodology and prevention, by promoting research collaborations. This training will result in three manuscripts currently in preparation and one recently submitted to *Scientific Reports*.

2017-2019 **Biomedical Big Data to Knowledge Training Grant awardee (B2D2K; T32 LM012415, \$90,000).**

The interactions between the genome and health have become relevant. This requires researches capable of handling large datasets or *Big Data*. Thus, this scholarship capitalizes on the large datasets generated in the biomedical research in recent years, focusing on training in the areas of informatics and statistics. Therefore, to acquire these skills and contribute to a better understanding of the area of genomics and addiction, I applied to this training grant. This scholarship is highly competitive, where the selection is based on a research proposal in the area of *Big Data*, publications in scientific journals, and an excellent curriculum vitae. Obtaining this scholarship allowed me to obtain a bioinformatics certification, in addition to train with researchers in the area of statistics and data science. This training resulted in the publication of a first-author manuscript submitted to PLOS ONE in 2018.

2015-2019 **BECAS CHILE- Chilean scholarship for international Ph.D. degrees (N° 72160326).**
Comisión Nacional de Investigación Científica y Tecnológica (CONICYT), Ministry of Education, Chile.

Competitive scholarship for Chilean students pursuing Ph.D. degrees abroad. The selection is based on the ranking of the Ph.D. program and international university, applicant's publication record, and experience in research.

RESEARCH FUNDS AND AWARDS

- 2019-2020** **Biobehavioral Dissertation Research Award (\$3,000).**
 Department of Biobehavioral Health, College of Health and Human Development, The Pennsylvania State University.
 Competitive award to fund dissertation research. Selection based on project proposal and curriculum vitae.
- 2018-2019** **Elizabeth J. Susman Enhancement Fund Award in Biobehavioral Health (\$1,354).**
 Department of Biobehavioral Health, College of Health and Human Development, The Pennsylvania State University.
 Competitive award to fund dissertation research. Selection based on project proposal and curriculum vitae.
- 2015-2016** **Fund for Excellence in Graduate Recruitment Award (\$2,000).**
 Department of Biobehavioral Health, College of Health and Human Development, The Pennsylvania State University.
- 2014** **Graduation honor award, Anthropology 2015 cohort.**
 Department of Anthropology, University of Chile, Santiago, Chile.

TRAVEL AWARDS

- 2017** **Noll Laboratory Travel Grant (\$1,500).**
 Competitive travel award based on a project proposal.
- 2016** **International Behavioural and Neural Genetics Society (IBANGS) travel award (\$1,000).**
 Competitive travel award based on abstract submission and an application.
- 2016** **Center for Brain, Behavior, and Cognition (CBBC) Travel Award (\$800).**
 Competitive travel award based on abstract submission and an application.

PROFESSIONAL EXPERIENCE

Ad-Hoc Manuscript Reviews

- *Scientific Reports*
- *Genes, Brain and Behavior* (with advisor)
- *Alcoholism: Clinical and Experimental Research* (with advisor)

SCIENCE COMMUNICATION COLUMNS

Those few cigarette puffs during adolescence might have altered your brain, Massive Science (June, 2019), <https://massivesci.com/articles/smoking-vaping-risks-adolescent-brain-function-development-addiction-nicotine/>

PROFESSIONAL SERVICE

500 Women in Science (2019)– Coordination committee to start State College Pod.

Científico Latino (2019) – Guidance for underrepresented students applying to STEM graduate programs.

RESEARCH EXPERIENCE

- 2015- present** **Graduate research assistant.**
 Behavioral and Neurogenetics Laboratory (Dr. Helen Kamens).
 Department of Biobehavioral Health, College of Health and Human Development, The Pennsylvania State University.
Role: DNA/RNA extraction, Analysis of RNA-Seq data using R, WGCNA (Weighted gene co-expression network analysis), IPA (Ingenuity Pathway Analysis), and RT-qPCR.
- 2012-2014** **Laboratory and research assistant.**
 Genetics and Anthropology Laboratory (Dr. Sergio Flores).
 Department of Anthropology, University of Chile, Santiago, Chile.
Role: DNA extraction from saliva samples, protocols standardizations, design of primers, PCR protocol procedures, use of bioinformatics software (MEGA 5, Arlequin, Bioedit) and other software as BLAST, PrimerInput, Nebcutter, PlasmidID, and R.
- 2013** **Laboratory assistant.**
 Genetics and Anthropology Laboratory (P.I.: Dr. Sergio Flores).
 Department of Anthropology, University of Chile, Santiago, Chile.
Project: "*Interactions and human mobility in pre-Hispanic populations of Northern Chile: an integrative approach for the Social Sciences using biomedical, genetic, chemical and mineralogical markers*" funded by Anillos ACT-96.
Role: Protocol standardization for plants primers corresponding to Algarrobo (*Prosopis chilensis*) and chañar (*Geoffroea decorticans*).
- 2012** **Laboratory assistant.**
 Genetics and Anthropology Laboratory (P.I.: Dr. Sergio Flores).
 Department of Anthropology, University of Chile, Santiago, Chile.
Project: "*Paleodiet evolution in northern of Chile populations: bioanthropological and oral microbiome evidence*" funded by FONDECYT 1110461.
Role: Sampling processing and protocol standardization of *Streptococcus massiliensis* primers.
- 2011** **Archaeology laboratory assistant.**
 Las Condes, Región Metropolitana, Chile (P.I.: Dr. Aryel Pacheco).
Project: "*Bioarchaeological Analysis Project, Site "El Olivar" Brillamar*" project funded by FONDECYT.
Role: Osteological Inventory of bioarcheological remains.
- 2010** **Bioarcheological conservation curator assistant.**
 Padre Le Paige Museum, San Pedro de Atacama, Chile.
Role: Curation and conservation of bioarcheological remains.
- 2009** **Research assistant**
 Osteoskeletal Laboratory.
 Department of Anthropology, University of Chile, Santiago, Chile.
Project: "*Comparative analysis of indicators of Diet and Environmental Stress in Prehistoric*

Bioanthropological Material Northern of Chile: A Biocultural approach".

Role: Dental data compilation from prehistoric osteological collection.

TEACHING EXPERIENCE

- 2017** **Graduate teaching assistant.**
 Department of Biobehavioral Health, College of Health and Human Development, The Pennsylvania State University.
BBH 302: Diversity and Health.
 Professor Gary King. (Spring semester).
BBH 310: Research Strategies for Studying Biobehavioral Health.
 Professor Hannah Schreier. (Spring semester).
- 2016** **Graduate teaching assistant.**
 Department of Biobehavioral Health, College of Health and Human Development, The Pennsylvania State University.
BBH 302: Diversity and Health.
 Professor Lori Francis. (Fall semester).
BBH 311: Interdisciplinary Integration in Biobehavioral Health.
 Professor Jennifer Graham-Engeland. (Fall semester).
- 2015** **Graduate teaching assistant.**
 Department of Biobehavioral Health, College of Health and Human Development, The Pennsylvania State University.
BBH 310: Research Strategies for Studying Biobehavioral Health.
 Professor Joseph Gyekis. (Spring semester).
BBH 311: Interdisciplinary Integration in Biobehavioral Health.
 Professor Jennifer Graham-Engeland. (Spring semester).
- 2014** **Undergraduate professor assistant.**
 Department of Anthropology, University of Chile, Santiago, Chile.
Biology.
 Professor Sebastian Krapivka. (Spring semester).
- 2010-2013** **Undergraduate teaching assistant.**
 Department of Anthropology, University of Chile, Santiago, Chile.
Evolution II. Professor Sergio Flores.
Population Genetics. Professor Sergio Flores.
Introduction to Physical Anthropology. Professor Sebastian Krapivka.
Bioinformatics. Professor Sergio Flores.
Statistics II. Professor Francisco Marro.
Statistics I. Professor Francisco Marro.

SOFTWARE SKILLS

- Basic** Photoshop, Python, and Shell scripting language.
- Advanced** Excel, Word, PowerPoint, Mega5, Bioedit, Cytoscape, Inkscape, and R.

LANGUAGES

English Professional level proficiency (oral communication and writing skills).

Spanish Native level proficiency.

PROFESSIONAL AFFILIATIONS

The Society for Research on Nicotine & Tobacco (SRNT)

The Methodology Center at The Pennsylvania State University

The Edna Bennett Pierce Prevention Research Center (PRC) at The Pennsylvania State University

The International Behavioural and Neural Genetics Society (IBANGS)

Sociedad Chilena de Antropología Biológica (SOCHIAB)

ACADEMIC REFERENCES

Dr. Helen Kamens

Assistant professor of Biobehavioral Health

219 Biobehavioral Health Building

The Pennsylvania State University

University Park, PA 16802

United States

hmk123@psu.edu

Dr. Michelle de Saint Pierre

Associate professor of Anthropology

Facultad de Ciencias Sociales, Universidad de Chile

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Santiago, Chile

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