

BIOGRAPHICAL SKETCH

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NAME: Santos, Hudson

eRA COMMONS USER NAME: hudson.santos

POSITION TITLE: Dean, Professor, Dolores J. Chambreau Endowed Chair

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE	Completion Date MM/YYYY	FIELD OF STUDY
State University of Paraiba	BSN	10/2009	Nursing
University of Sao Paulo	PhD	01/2013	Nursing Research
Duke University	Postdoctoral Fellow	07/2015	Longitudinal & Biobehavioral methods

A. Personal Statement

I am the Dean, Professor, and the Dolores J. Chambreau Endowed Chair at the University of Miami School of Nursing and Health Studies. I am also the President-Elect of the International Society of Nurses in Genetics. I am an expert in early life adversity, socio determinants of health, and genomics related to maternal-child health and child development in at-risk populations. Methodologically, I have extensive training and experience with longitudinal studies, both epidemiological cohorts and clinical interventions. A major focus of my team is to understand the biological embedding of social determinants of health, and related maternal and child development outcomes. In these studies, we look at birth outcomes as well as child physical and socio-emotional development throughout childhood. I have a strong track-record investigating the role of genomics on child neurodevelopment (R01NR019245, R03HD101413, K23NR017898). One my current R01 awards focuses on the genetics and epigenetics pathways for neurodevelopmental impairment using the Extremely Low Gestational Age Newborns (ELGAN; UH3OD023348) cohort study. In the ELGAN study, I serve as Co-Investigator and lead the genomics and positive child health interest group. I have another R01 award in its final year, focused on a randomized trial to improve the weight management of Latina mothers and children and identify the biosocial pathways for effective weight reduction (R01NR017199). I am also the PI of a UG3/UH3 (UG3OD035542) that is establishing a diverse cohort of mothers, children, and fathers in Miami-Dade County as part of the Environmental influences on Child Health Outcomes (ECHO) Program. I have substantial experience with study coordination, clinical and methodological expertise, population access, data management and biostatistics data analysis, and have a strong history of collaboration and studies with focus on maternal-child health among at-risk populations. For this P50, I will work closely with Dr. McCauley as MPI of the CLEER (Cumulative Environmental Exposure Research) Center. We have a history of collaboration in both research and mentoring early career scientists. Together, we will provide governance structure ensuring seamless integration of CLEER's research, training, and outreach components. We will facilitate resource allocation, streamline operations, and address legal, regulatory, and administrative issues in collaboration with the community advisory board and executive committee.

Ongoing and recently completed projects that I would like to highlight include:

UG3OD035542

Santos (MPI)

09/2023 – 08/2030

Miami-ECHO: A Diverse Cohort of Mothers, Children and Fathers in Miami-Dade County

R01NR019245

Santos (PI)

09/2020 – 07/2025

Genetic and Epigenetic Effects on Childhood Cognitive Trajectories

R01NR017199

Santos (PI)

08/2019 – 06/2023 (NCE 06/30/2024)

Healthy Mothers-Healthy Children: An Intervention with Hispanic Mothers and their Young Children

UG3OD023348

Fry, O'Shea (MPI), Role: Co-Investigator

09/2023 – 08/2030

Environment, Epigenetics, Neurodevelopment & Health of Extremely Preterm Children

Relevant Publications:

1. Bhattacharya A, Freedman AN, Avula V, Harris R, Liu W, Pan C, Lulis AJ, Joseph RM, Smeester L, Hartwell HJ, Kuban KCK, Marsit CJ, Li Y, O'Shea M, Fry RC, & **Santos HP Jr.** (2022). Placental genomics mediates genetic associations with complex health traits and disease. *Nature Communications*, 13, 706. doi: 10.1038/s41467-022-28365-x. PMID: PMC8817049.
2. Harris RA, Chen D, & **Santos HP Jr.** (2022). Which roads lead to depression in Latinas? A network analysis of prenatal depressive symptoms, discrimination, acculturative stress, and low birth weight. *Research in Nursing & Health*, 45(3):350-363. doi: 10.1002/nur.22210. PMID: PMC9064940.
3. **Santos HP Jr.**, Adynski H, Nephew B, Bhattacharya A, Tan X, Smith L, Alyamani R, & Murgatroyd C. (2021). Biopsychosocial correlates of psychological distress in Latina mothers. *Journal of Affective Disorders*, 282,617-626. doi: 10.1016/j.jad.2020.12.193. PMID: PMC7889736.
4. **Santos HP Jr.**, Nephew B, Bhattacharya A, Tan X, Smith L, Alyamani R, Martin EM, Perreira K, Fry R, & Murgatroyd C. (2018). Discrimination exposure and DNA methylation of stress-related genes in Latina mothers. *Psychoneuroendocrinology*, 98, 131-138. doi: 10.1016/j.psyneuen.2018.08.014. PMID: PMC6204298.

B. Positions, Scientific Appointments, and Honors

Positions and Scientific Appointments

2024 – present Dean, University of Miami, School of Nursing & Health Studies

2022 – present Professor, Dolores J. Chambreau Endowed Chair, University of Miami, School of Nursing & Health Studies

2022 – present Faculty Fellow, University of Miami, Mailman Center for Child Development

2022 – present President-Elect, International Society of Nurses in Genetics

2022 – present Affiliated Faculty, University of North Carolina, School of Nursing and School of Medicine

2021 – present Councilor of Programming, Council for the Advancement of Nursing Science (CANS)

2020 – 2022 Beerstecher-Blackwell Distinguished Term Scholar, University of North Carolina at Chapel Hill

2020 – 2021 Co-Chair, 2021 Advanced Methods Conference, CANS

2020 – 2022 Associate Professor, University of North Carolina at Chapel Hill, School of Nursing

2021 Grant Reviewer, National Science Center, Poland

2019 – 2022 Faculty Fellow, UNC Frank Porter Graham Child Development Institute

2021 – present Investigator, UNC Intellectual and Developmental Disabilities Research Center (IDDRC)

2020 – 2022 Member, Program Committee, CANS 2020 State of the Science Congress on Nursing Research

2020 – 2022 Director, UNC Biobehavioral Laboratory Core

2020 – present Council Member-Elect, the United States Developmental Origins of Health and Disease (DOHaD) Society

2019 – present Reviewer, NIMHD Career Awards Grant Review Panel (K applications)

2019 – 2020 Reviewer, Netherlands Organization for Scientific Research (NWO), Innovational Research Incentives Scheme Veni grant, Social Sciences and Humanities Board

2019 – 2022 Member, Executive Committee for the T32 Carolina Consortium on Human Development

2019 – 2022	UNC Faculty Council – Voting member
2018 – 2021	Academic Editor, PLOS ONE
2018 – 2020	Member, PhD Executive Committee, UNC School of Nursing
2018 – 2022	Director of Training & Mentorship Division, UNC Institute for Environmental Health Solutions, Gillings School of Global Public Health
2018 - present	Member, NIH Strategic Working Group on Genetics and Epigenetics in the ECHO Program
2018	Reviewer, NIMHD Research Conference Grant (R13 applications)
2016 – 2020	Advisory Board Member, UNC Biobehavioral Laboratory
2015 – 2020	Assistant Professor, University of North Carolina at Chapel Hill, School of Nursing
2014 – 2016	Center Investigator, P30 Center of Excellence for Cognitive/Affective Symptom Science. Duke University School of Nursing
2013 – 2015	Post-Doctoral Associate, Duke University, School of Nursing, Durham
2012 – 2012	Visiting Scholar, University of British Columbia, School of Nursing, Vancouver
2009 – 2010	Staff Nurse, Community Mental Health Clinic

Honors

2022	Fellow, American Academy of Nursing
2022	Founders' Award for Research Excellence, International Society of Nurses in Genetics
2020	Best Oral Presentation Award, Society for Maternal-Fetal Medicine 40th Annual Pregnancy Meeting, Texas
2019	Reviewers' choice abstract, World Congress of Nurses in Genetics, San Antonio, Texas
2019	Scholar, Summer Institute on Biological Approaches in the Social Sciences, Northwestern University
2017	NIMHD Health Disparities Research Institute (HDRI) Scholar
2016	Abstract of Distinction, State of the Science Congress on Nursing Research, Council for the Advancement of Nursing Science
2015	Emerging Nurse Scholar, Lawrence S. Bloomberg Faculty of Nursing, University of Toronto
2012	Honors Doctorate Scholarship – Research Internship Abroad, Sao Paulo Research Foundation
2010	Honors Doctorate Scholarship, Sao Paulo Research Foundation
2009	Excellence Research Honor, State University of Paraiba
2007, 2008	Jane da Fonseca Proença Award – Research Excellence in Psychiatric Nursing, Mental Health and Interpersonal Relationships, Brazilian Association of Nursing

C. Contributions to Science

1. Latino health and the biological embedding of sociocultural stress: My team and I have researched health outcomes of Latina mother-child health for many years. We have explored disparities in birth outcomes as well as child physical and socio-emotional development with US-born and non-US-born Latinas. We also study the effects on sociocultural stressors in the disparities of health outcomes observed in the Latino populations within and outside the US. Our team is one of the first to document how ethnic discrimination affects changes in the genome of Latina mothers, and the intricate role of physical health and acculturation in determining the risk level of those families to develop negative health outcomes (e.g., depression, cardiovascular problems, obesity). I am the PI of these studies which have been funded through both internal and external sources.
 - a. Harris RA, Chen D, & **Santos HP Jr.** (2022). Which roads lead to depression in Latinas? A network analysis of prenatal depressive symptoms, discrimination, acculturative stress, and low birth weight. *Research in Nursing & Health*, 45(3):350-363. doi: 10.1002/nur.22210. PMID: PMC9064940.
 - b. Rodriguez ACI, Smith L, Harris R, Nephew BC, **Santos HP Jr.**, & Murgatroyd C. (2022). Oxytocin modulates sensitivity to acculturation and discrimination stress in pregnancy. *Psychoneuroendocrinology*, 141:105769. doi: 10.1016/j.psyneuen.2022.105769. PMID: n/a.
 - c. **Santos HP Jr.**, Adynski H, Nephew B, Bhattacharya A, Tan X, Smith L, Alyamani R, & Murgatroyd C. (2021). Biopsychosocial correlates of psychological distress in Latina mothers. *Journal of Affective Disorders*, 282,617-626. doi: 10.1016/j.jad.2020.12.193. PMID: PMC7889736.
 - d. **Santos HP Jr.**, Nephew B, Bhattacharya A, Tan X, Smith L, Alyamani R, Martin EM, Perreira K, Fry R, & Murgatroyd C. (2018). Discrimination exposure and DNA methylation of stress-related genes in Latina mothers. *Psychoneuroendocrinology*, 98, 131-138. doi: 10.1016/j.psyneuen.2018.08.014. PMID: PMC6204298.

2. Identification of developmental origins of child health outcomes: I have devoted substantial attention to identify genomic mechanisms of child neurodevelopment. My overall goal is to identify epigenetic markers early in life to predict later life neurodevelopmental outcomes, and for use as potential screening biomarkers and/or molecular targets for interventions. Most of our team's current work concentrates on the placenta in population-based work. In our current R01, we have identified several findings related to epigenetic markers that are predictive of child health and neurodevelopmental outcomes among preterm children.
 - a. **Santos HP Jr**, Bhattacharya A, Joseph RM, Frazier J, Hooper SR, Douglas L, Kuban KC, O'Shea TM, & Fry R. (2020). Evidence for the placenta-brain axis: multi-omic kernel aggregation predicts intellectual and social impairment in children born extremely preterm. *Molecular Autism*, 11,97. doi: 10.1186/s13229-020-00402-w. PMCID: PMC7730750.
 - b. Payton A, Clark J, Eaves L, **Santos HP Jr**, Smeester L, Bangma J, O'Shea TM, Fry RC, & Rager JE. (2020). Placental genomic and epigenomic signatures associated with infant birth weight highlight mechanisms involved in collagen and growth factor signaling. *Reproductive Toxicology*, 96:221-230. doi:10.1016/j.reprotox.2020.07.007. PMCID: PMC7855285.
 - c. Bulka CM, Dammann O, **Santos HP Jr**, VanderVeen DK, Smeester L, Fichorova R, O'Shea TM, & Fry RC. (2019). Placental CpG methylation of inflammation, angiogenic and neurotrophic genes and retinopathy of prematurity. *Investigative Ophthalmology & Visual Science Journal*, 60(8):2888-2894. doi: 10.1167/iovs.18-26466. PMCID: PMC6607927.
 - d. Clark JS, Martin EM, Bulka CM, Smeester L, **Santos HP Jr**, O'Shea TM, & Fry RC. (2019). Associations between placental CpG methylation of metastable epialleles and childhood body mass index across ages one, two and ten in the Extremely Low Gestational Age Newborns (ELGAN) cohort. *Epigenetics*, 14(11):1102-1111. doi: 10.1080/15592294.2019.1633865. PMCID: PMC6773381.
3. The effects of the social environment on the epigenome and related perinatal and child health outcomes: Complementing and extending my developmental origins of child health origins work, I aim to understand the effects of social hardship (e.g., social adversity) and early life stressors in children's developmental outcomes. Currently, I have focused my work and expertise more widely on the effects of maternal hardship, early life stressors and the effects of the epigenome on children's outcomes. Taken together, my work bridges the gap between the social and the biological dimensions of maternal hardship, early life stressors and child development.
 - a. Clark J, Bulka CM, Martin CL, Roell K, **Santos HP Jr**, O'Shea TM, Smeester L, Fry RC, & Dhingra R. (2022). Placental epigenetic gestational aging in relation to maternal sociodemographic factors and smoking among infants born extremely preterm: a descriptive study. *Epigenetics*, 17(13):2389-2403. doi: 10.1080/15592294.2022.2125717. PMCID: PMC9665142.
 - b. **Santos HP Jr**, Martin E, Mokrova I, Joseph RM, Hooper S, Frazier J, Kuban KCK, O'Shea M, & Fry RC. (2019). Epigenome-wide placental DNA methylation: Associations with socioeconomic factors in mothers of preterm children. *Epigenetics*, 14(8):751-765. doi: 10.1080/15592294.2019.1614743. PMCID: PMC6615526.
 - c. Sluiter F, Nephew BC, Rodriguez A, Murgatroyd C, & **Santos HP Jr** (2020). Pregnancy associated epigenetic markers of inflammation predict depression and anxiety symptoms in response to discrimination. *Neurobiology of Stress*, 13:100273. doi: 10.1016/j.ynstr.2020.100273. PMCID: PMC7739167.
 - d. Pittet F, Van Caenegem N, Hicks-Nelson A, **Santos HP Jr**, Bradburn S, Murgatroyd C, & Nephew B. (2019). Maternal social environment affects offspring cognition through behavioral and immune pathways in rats. *Journal of Neuroendocrinology*, 31(9), e12711. doi: 10.1111/jne.12711. PMCID: n/a.
4. Identifying and promoting positive child health outcomes: I have devoted substantial time to study the long-term health of children born at risk for adverse neurodevelopmental outcomes. My expertise focuses on social and biological antecedents of positive health outcomes. I am particularly interested in high-risk children (e.g., low-income Latinx children, children born preterm), because they are more likely to experience adverse health outcomes over time. However, one major gap in the literature is surrounding the fact that some children show positive health outcomes, despite their high-risk environment and early life stressors. To address this, we have conducted both experimental and epidemiological work to create the tools necessary to investigate positive child health outcomes. Currently, we are completing a R03 study focused on the molecular pathways that lead to positive health outcomes.

- a. Bangma J, Kwiatkowski E, Psioda M, **Santos HP Jr**, Hooper SR, Douglas L, Joseph RM, Frazier J, Kuban KCK, O'Shea TM, & Fry RC. (2019). Early life antecedents of positive child health index among 10- year-old children born extremely preterm. *Pediatric Research*. 86 (6), 758-765. doi:10.1038/s41390-019-0404-x. PMID: PMC6802282.
 - b. Bangma J, Kwiatkowski E, Psioda M, **Santos HP Jr**, Hooper SR, Douglas L, Joseph RM, Frazier J, Kuban KCK, O'Shea TM, & Fry RC. (2018). Assessing positive child health among individuals born extremely preterm. *Journal of Pediatrics*, 202:44-49. doi: 10.1016/j.jpeds.2018.06.037. PMID: PMC6456448.
 - c. Freitas P, Kimoro A, **Santos HP Jr**, & Holditch-Davis D. (2017). Biobehavioral responses of preterm infants to conventional and swaddled tub baths: A randomized crossover trial. *Journal of Perinatal and Neonatal Nursing*, 32(4):358-365. doi: 10.1097/jpn.0000000000000336. PMID: n/a.
 - d. **Santos HP Jr**, Yang Q, Docherty S, White-Traut R, & Holditch-Davis D. (2016). Relationship of maternal psychological distress classes to later mother–infant interaction, home environment, and infant development in preterm infants. *Research in Nursing & Health*, 39(3):175-86. doi:10.1002/nur.21719. PMID: PMC5531175.
5. Maternal-child health outcomes in low-income setting and the effects of emerging stressors. Over the last years, we have observed a tremendous uptake of environmental changes that have led to the increase of novel virus affecting the health of mother-child dyads, especially when these dyads are at high risk due to their socioeconomic status and race/ethnicity. We have conducted studies to understand the effects of Zika virus on mothers and children in Brazil, and recently the potential effects of COVID in birth and child developmental outcomes. We have made substantial contribution to this emerging literature and hope to identify modifiable factors that can be used to reduce families' risk of infection and negative health outcomes.
- a. Martins-Filho PRS, Quintans-Júnior LJ, Souza AA, Sposato KB, Tavares CS, Gurgel RQ, Fontes DC, Paiva SM, Santos VS, & **Santos HP Jr** (2021). Socio-economic inequalities and COVID-19 incidence and mortality in Brazilian children. A nationwide register-based study. *Public Health*, 190:4-6. doi: 10.1016/j.puhe.2020.11.005. PMID: PMC7833565.
 - b. Martins-Filho PR, Tanajura D, Santos VS, & **Santos HP Jr** (2020). COVID-19 during pregnancy: Potential risk for neurodevelopmental disorders in neonates? *European Journal of Obstetrics & Gynecology and Reproductive Biology*, 250(20):255-257. doi: 10.1016/j.ejogrb.2020.05.015. PMID: PMC7211568
 - c. Oliveira AMM, Melo EGM, Mendes MLT, Oliveira SJGS, Tavares CSS, Vaez AC, Vasconcelos SJA, **Santos HP Jr**, Santos VS, & Martins-Filho PRS. (2020). Oral and maxillofacial findings, dietary aspects, and nutritional status of children with congenital Zika syndrome. *Oral Surgery, Oral Medicine, Oral Pathology and Oral Radiology*, 130(1), 71-77. doi: 10.1016/j.oooo.2020.02.019. PMID: n/a.
 - d. Vieira P, Carvalho E, & **Santos HP Jr**. (2019). Bad news: Families' experience surrounding the diagnosis of Zika virus-related microcephaly. *Nursing Inquiry*, 26(1), e12274. doi: 10.1111/nin.12274. PMID: n/a.

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