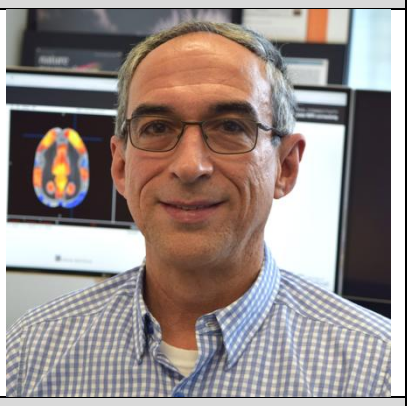
Curriculum Vitae

Personal Information

Title	**Professor**
Name	**Afonso C. Silva**
Degree	**PhD**
Country	**United States of America**
Affiliation	**University of Pittsburgh**



Educational Background

03/1985 – 06/1990	BS Electrical Engineering, Universidade Federal de Pernambuco, Recife, Pernambuco, Brazil
08/1990 – 07/1992	MS Electrical Engineering, Universidade Federal de Pernambuco, Recife, Pernambuco, Brazil
08/1992 – 09/1996	PhD Bioengineering, Carnegie Mellon University, Pittsburgh, PA, USA
09/1996 – 07/1997	Postdoctoral Fellow Biological Sciences, Carnegie Mellon University, Pittsburgh, PA USA
08/1997 – 07/1999	Postdoctoral Fellow, Center for Magnetic Resonance Research, University of Minnesota, Minneapolis, MN, USA

Professional Career

Dr. Silva earned his BS (1990) and MS (1992) degrees in Electrical Engineering from Universidade Federal de Pernambuco in Recife, Brazil. He moved to the USA in 1992 to attend the graduate program in Bioengineering at Carnegie Mellon University in Pittsburgh, PA. Dr. Silva's doctoral work focused on developing using the arterial spin labeling (ASL) technique to image and quantify cerebral blood flow (CBF) noninvasively with MRI. He made significant contributions to the development of ASL, from modeling water exchange across the blood-brain barrier to quantifying CBF accounting for arterial transit times and labeling efficiency. After earning his Ph.D. in 1996, Dr. Silva undertook post-doctoral training at the Center for Magnetic Resonance Research at the University of Minnesota, where he used ultra-high field MRI to investigate the temporal and spatial characteristics of cerebral hemodynamics as surrogate markers of functional brain activation. In 1999, Dr. Silva joined the Intramural Research Program of the National Institute of Neurological Disorders and Stroke (NINDS) as a Staff Scientist, becoming a Principal Investigator in 2004 and obtaining tenure in 2012. In 2018, Dr. Silva moved to the University of Pittsburgh, where he is the Endowed Professor of Translational Neuroimaging in the Department of Neurobiology and holds a secondary appointment in the Department of Bioengineering.

Research Field

Dr. Silva is a world-renowned neuroscientist with extensive training and experience developing and implementing multimodal neuroimaging techniques (MRI, PET/CT, optical microscopy, whole-brain electrophysiology) to investigate the structural and functional organization of the brain. Notably, Dr. Silva specializes in working with marmosets, a New World non-human primate species that offers several advantages as an experimental model in the field of neuroscience and the study of neurological disorders. Dr. Silva's research program has been pushing the spatial resolution of ultra-high field MRI to visualize the neuroanatomy of the marmoset brain with cytoarchitectonic detail. His work led to the generation of novel 3D MRI-based atlases for the marmoset brain that have shaped our understanding of the anatomical organization of white-matter axonal pathways and which have significant implications for the study of neurodevelopmental disorders. Dr. Silva also pushed the temporal resolution of hemodynamic-based fMRI techniques that have established temporal benchmarks for the hemodynamic response to increased brain activity. Dr. Silva's proficiency extends to genomic engineering in small animal

models. He has successfully generated transgenic marmosets expressing genetically encoded calcium indicators and genetically engineered marmosets with NOTCH3 mutations, which serve as a model for cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy (CADASIL) and marmosets expressing PSEN1 mutations as an early-onset Alzheimer's disease model. These animals show disease-associated phenotypes that support the hypothesis that the marmoset will reveal the earliest cellular and molecular root causes for AD. Dr. Silva is also pursuing the development of marmoset models for late-onset AD.

Dr. Silva has consistently demonstrated his leadership capabilities throughout his career by leading fully funded, productive, and impactful research programs. His work has significantly contributed to advancing our understanding of the structural and functional organization of the primate brain in both health and disease.

Main Scientific Publications

1. Park JE, Silva AC. Generation of genetically engineered non-human primate models of brain function and neurological disorders. Am J Primatol. 2019 Feb;81(2):e22931. doi: 10.1002/ajp.22931.
2. Liu C, Yen CC, Szczupak D, Ye FQ, Leopold DA, Silva AC. Anatomical and functional investigation of the marmoset default mode network. Nat Commun. 2019 Apr 29;10(1):1975. doi: 10.1038/s41467-019-09813-7.
3. Liu C, Ye FQ, Newman JD, Szczupak D, Tian X, Yen CCC, Majka P, Glen D, Rosa MGP, Leopold DA, Silva AC. A resource for detailed 3D mapping of white matter pathways in the marmoset brain. Nature Neurosci. 2020 Feb;23(2):271-280. doi:10.1038/s41593-019-0575-0.
4. Szczupak D, Iack PM, Liu C, Tovar-Moll F, Lent R, Silva AC. Direct Interhemispheric Cortical Communication via Thalamic Commissures: A New White-Matter Pathway in the Rodent Brain. Cereb Cortex. 2021 Aug 26;31(10):4642-4651. doi: 10.1093/cercor/bhab112.
5. Szczupak D, Iack PM, Rayêe D, Liu C, Lent R, Tovar-Moll F, Silva AC.The relevance of heterotopic callosal fibers to interhemispheric connectivity of the mammalian brain. Cereb Cortex. 2022 Sep 30:bhac377. doi: 10.1093/cercor/bhac377.
6. Tian X, Chen Y, Majka P, Szczupak D, Perl YS, Yen CC, Tong C, Feng F, Jiang H, Glen D, Deco G, Rosa MGP, Silva AC, Liang Z, Liu C. An integrated resource for functional and structural connectivity of the marmoset brain. Nat Commun. 2022 Dec 1;13(1):7416. doi: 10.1038/s41467-022-35197-2.
7. Szczupak D, Schaeffer DJ, Tian X, Choi SH, Fang-Cheng, Iack PM, Campos VP, Mayo JP, Patsch J, Mitter C, Haboosheh A, Vieira MAC, Kasprian G, Tovar-Moll F, Lent R, Silva AC. Direct interhemispheric cortical communication via thalamic commissures: a new white-matter pathway in the primate brain. Cereb Cortex. 2023 Nov 9:bhad394. doi: 10.1093/cercor/bhad394.
8. Sukoff Rizzo SJ, Homanics G, Schaeffer DJ, Schaeffer L, Park JE, Oluoch J, Zhang T, Haber A, Seyfried NT, Paten B, Greenwood A, Murai T, Choi SH, Huhe H, Kofler J, Strick PL, Carter GW, Silva AC. Bridging the rodent to human translational gap: Marmosets as model systems for the study of Alzheimer's disease. Alzheimers Dement (N Y). 2023 Aug 21;9(3):e12417. doi: 10.1002/trc2.12417.
9. Homanics GE, Park JE, Bailey L, Schaeffer DJ, Schaeffer L, He J, Li S, Zhang T, Haber A, Spruce C, Greenwood A, Murai T, Schultz L, Mongeau L, Ha SK, Oluoch J, Stein B, Choi SH, Huhe H, Thathiah A, Strick PL, Carter GW, Silva AC, Sukoff Rizzo SJ. Early molecular events of autosomal-dominant Alzheimer's disease in marmosets with PSEN1 mutations. Alzheimers Dement. 2024 May;20(5):3455-3471. doi: 10.1002/alz.13806.
10. Huhe H, Shapley SM, Duong D, Wu F, Ha SK, Choi SH, Kofler J, Mou Y, Guimaraes TR, Thathiah A, Schaeffer LKH, Carter GW, Seyfried NT, Silva AC, Sukoff Rizzo SJ. Marmosets as model systems for the study of Alzheimer's disease and related dementias: substantiation of physiological Tau 3R and 4R isoform expression and phosphorylation. Alzheimers Dement. 2024 Nov 19. doi: 10.1002/alz.14366.