

## Kauê Machado Costa, PhD

E-mail: kaue.m.costa@gmail.com

ORCID ID: 0000-0002-5562-6495

251 Bayview Blvd, Suite 200

Baltimore, MD 21224

Phone: 410-570-5884

---

### PROFESSIONAL EXPERIENCE

- 2018-Present **Postdoctoral visiting fellow**, National Institute on Drug Abuse (NIDA) Intramural Research Program (USA)  
Supervisor: **Dr. Geoffrey Schoenbaum**
- 2018 **Postdoctoral research assistant**, Goethe University (Germany)  
Supervisor: **Dr. Jochen Roeper**
- 2013-2018 **Graduate research assistant**, Goethe University (Germany)  
Supervisor: **Dr. Jochen Roeper**

### EDUCATION

- 2012-2018 **PhD, Neuroscience**, Max Planck Institute for Brain Research / International Max Planck Research School for Neural Circuits, and Goethe University (Germany)  
Mentor: **Dr. Jochen Roeper**
- 2010-2012 **MSc, Physiology**, School of Medicine of Ribeirão Preto, University of São Paulo (Brazil)  
Mentor: **Dr. Benedito Honório Machado**
- 2006-2010 **BS, Biological Sciences**, GPA 9.02/10 (4.0 in US system), Class rank 1, valedictorian, Institute of Biological Sciences, Federal University of Pará (Brazil)  
Mentor: **Dr. Manoel da Silva Filho**

### FUNDING

- 2022-2027 **K99/R00 Pathway to Independence Award**, 1K99DA055641-01, impact score 13, funded on 1<sup>st</sup> submission, NIDA (USA)
- 2019-2023 **Postdoctoral fellowship**, German Research Foundation - DFG (Germany/USA)
- 2012-2013 **Doctoral graduate fellowship**, Max Planck Society (Germany)
- 2010-2012 **Master graduate fellowship**, Coordination for Improvement of Higher Education Personnel - CAPES (Brazil)
- 2006-2010 **Scientific Initiation fellowship**, National Council for Scientific and Technological Development - CNPQ (Brazil)

### AWARDS AND HONORS

- 2023 **Harvard INCEPT seminar series speaker**, Harvard Medical School
- 2022 **Next Generation Leader**, Allen Institute
- 2022 **Paper featured in collection: "Top 100 in Neuroscience"**, Scientific Reports
- 2022 **Exceptional poster award**, Gordon Research Conference - Basal Ganglia
- 2021 **Johns Hopkins Hopkins Psychology and Brain Sciences Early Career Colloquium speaker**, Johns Hopkins University
- 2021 **Baltimore Brain Series speaker**, Baltimore Brain Series
- 2021 **Fellows Award for Research Excellence**, NIH
- 2021 **Outstanding poster award**, NIDA Poster Day, NIDA
- 2021 **NIDA Director's Award of Merit for Collaboration**, NIDA
- 2021 **Intersections Science Associate**, Yale School of Medicine
- 2020 **Trainee Professional Development Award**, Society for Neuroscience

- 2020 **Exceptional oral presentation award**, Brazilian Symposium of Neurosciences
- 2019 **Exceptional poster award**, Annual Meeting of the Baltimore SFN Chapter
- 2018 **Travel grant**, German Academic Exchange Service - DAAD
- 2018 **GRADE Center Brain award for best interdisciplinary poster**, Biennial meeting of the Rhine-Main Neuroscience Network
- 2017 **Trainee Professional Development Award**, Society for Neuroscience
- 2017 **Travel grant**, Association of Friends and Patrons of the Goethe University
- 2017 **Best oral presentation award**, Barcelona Young Neuroscientists Symposium
- 2017 **Travel grant**, Barcelona Young Neuroscientists Symposium
- 2016 **Exceptional poster award**, Annual meeting of the German Physiological Society
- 2012 **Exceptional poster award**, Brazilian Symposium of Cardiovascular Physiology
- 2011 **Exceptional poster award**, Brazilian Symposium of Cardiovascular Physiology
- 2010 **Award for highest final GPA of his graduating class**, Federal University of Pará
- 2008 **Exceptional poster award**, Annual Meeting of the Brazilian Federation of Experimental Biology Societies
- 2006 **Award for the first place in the biological sciences admissions process**, Federal University of Pará
- 2003 **José Márcio Ayres award for young naturalists**, Emílio Goeldi Museum

## TEACHING

- 2021-2022 **Instructor, Methods in Neuroscience Course**, *Class: In vivo electrophysiology and fiber photometry*. NIDA IRP, USA (latest student evaluation score: 4.84/5)
- 2019 **Instructor, Methods in Neuroscience Course**, *Class: Neural Circuits: In vivo*. NIDA IRP, USA
- 2015-2018 **Teaching assistant, Modern Topics in Neuroscience Course**, *Class: Reward systems and motivation*. International Max Planck Research School for Neural Circuits, Germany
- 2011 **Teaching assistant, Physiology Summer Course**, Department of Physiology, School of Medicine of Ribeirão Preto, University of São Paulo, Brazil

## MENTORSHIP

- 2023-2023 **James Atwell**, NIDA IRP postbac trainee
- 2021-2023 **Courtney Sercander**, NIDA IRP postbac trainee (now PhD student at UF)
- 2021-2023 **Jash Mirani**, NIDA IRP postbac trainee (now medical student at GWU)
- 2021-2022 **Lora Kovacheva**, Mainz University PhD student (now practicing clinician)
- 2020-2021 **Nishika Raheja**, NIDA IRP postbac trainee (now PhD student at Virginia Tech)
- 2019-2020 **Davied Sanchez**, NIDA IRP postbac trainee (now dental student at UNC)
- 2019-2020 **Daniela Schenkel**, Goethe University MD/PhD student
- 2019 **Aneesh Bal**, NIDA IRP summer student (now PhD student at Johns Hopkins)
- 2017 **Somanath Jagannath**, Goethe Uni. MS student (now PhD student at EPFL)
- 2017 **Felicia Müller-Braun**, Goethe University laboratory technician (now in industry)
- 2015-2017 **Navid Farassat**, Goethe University MD/PhD student (now practicing clinician)
- 2015-2017 **Lora Kovacheva**, Goethe University MD student (later PhD student, now clinician)
- 2015 **Kanako Otomo**, IMPRS-NC PhD rotation student (now postdoc at Uni. of Zurich)

## PUBLICATIONS

### *Pre-prints and submitted*

1. **Costa K.M.**, Raheja N., Mirani J., Sercander C., Schoenbaum G. *Striatal dopamine release reflects domain general prediction errors*. **bioRxiv**, 2023.08.19.553959v2. **Under review**
2. **Costa K.M.**, Hammer N., Knowlton C., Schwenk J., Müller T., Schulte D., Fakler B., Canavier C.C., Roeper J. *A biophysical regulator of inhibitory integration and learning in mesolimbic dopamine neurons*. **bioRxiv**, 344499. **Under review**
3. Zong W., Zhou J., Gardner M.P.H., Zhang Z., **Costa K.M.**, Schoenbaum G. *Schema cell formation in orbitofrontal cortex is suppressed by hippocampal output*. **bioRxiv**, 2023.05.03.539307. **Under review**
4. Chow J.J., Pitts K., Schoenbaum A., **Costa K.M.**, Schoenbaum G., and Shaham Y. *Different effects of peer-sex on operant responding for social interaction and striatal dopamine activity*. **Under review**
5. Cunha, B.M.L., Badarane, E.B.L., Sousa Filho, P.V.M.S., **Costa, K.M.**, da Silva Filho, M. *Dysfunctional suction dynamics in newborns with ankyloglossia*. **Under review**

### *Published and in press*

1. Wilkinson C.S., Luján M.Á., Hales C., **Costa K.M.**, Fiore V.G., Knackstedt L.A., and Kober H. *Listening to the data: computational approaches to addiction and learning*. **The Journal of Neuroscience**, in press
2. **Costa K.M.**, Scholz R., Lloyd, K., Moreno-Castilla P., Gardner M.P.H., Dayan P., Schoenbaum G. *The role of the lateral orbitofrontal cortex in creating cognitive maps*. **Nature Neuroscience**, 26, 107–115, 2023
3. **Costa K.M.**, Schoenbaum G. *Dopamine*. **Current Biology**, 32(15), PR817-R824, 2022. *Featured Primer*
4. **Costa K.M.** *Neuroscience: finding the middle ground of behavioral (in)flexibility*. **Current Biology**, 32(5), R223–R225, 2022
5. **Costa K.M.**, Sengupta A., Schoenbaum G. *The orbitofrontal cortex is necessary for learning to ignore*. **Current Biology**, 31(12), 2652–2657, 2021
6. **Costa K.M.**, Schenkel D., Roeper J. *Sex-dependent alterations in behavior, drug responses and dopamine transporter expression in heterozygous DAT-Cre mice*. **Scientific Reports**, 11, 3334, 2021. *Featured in the “Top 100 in Neuroscience” special collection for 2021 (in top 25)*
7. **Costa K.M.**, Schoenbaum G. *Replication efforts have limited epistemic value*. **Nature**, 599 (7884), 201-201, 2021
8. **Costa K.M.**, Schoenbaum G. *Neuroscience: what, where and how wonderful?* **Current Biology**, 31(14), 3053-3072, 2021
9. **Costa K.M.**, Sengupta A. *Short-term scholar visas are essential for science*. **Neuropsychopharmacology**, 46, 277–278, 2021.
10. Koury G.V.H., Araújo F.C.R.S, **Costa K.M.**, da Silva Filho M. *A digital filter-based method for diagnosing speech comprehension deficits*. **Mayo Clinic Proceedings: Innovations, Quality & Outcomes**, 5(2), 241-252, 2021.
11. Farassat N., **Costa K.M.**, Albert S., Kovacheva L., Shin J., Somayaji M., Schneider G., Roeper J. *In vivo functional diversity of midbrain dopamine neurons within identified axonal projections*. **eLife**, 8: e48408, 2019.
12. Schwenk J, Boudkkazi S, Kocylowski M.K., Brechet A, Zolles G, Bus T, **Costa K.M.**, Kollwe A, Jordan J, Bank J, Bildl W, Sprengel R, Kulik A, Roeper J, Schulte U, Fakler B. *An ER*

*assembly line of AMPA-Receptors controls excitatory neurotransmission and its plasticity.* **Neuron**, 104(4):680-692.e9, 2019.

13. Ribeiro L.B., Rodrigues A.R., **Costa K.M.**, da Silva Filho M. *Quantification of textual comprehension difficulty with an information theory-based algorithm.* **Palgrave Communications (Humanities and Social Sciences Communications)**, 5 (1), 1-9, 2019.
14. Iotchev I.B., **Costa K.M.** *Animal cognition: quantity has a quality of its own.* **Animal Sentience**, 23(44), 2019.
15. Messer M., **Costa K.M.**, Roeper J, Schneider G. *Multi-scale detection of rate changes in spike trains with weak dependencies.* **Journal of Computational Neuroscience**, 42(2), 187–201, 2017.
16. de Macedo M.S.F.C., **Costa K.M.**, da Silva Filho M. *Voice disorder in systemic lupus erythematosus.* **PLoS One**, 12(4): e0175893, 2017.
17. **Costa K.M.** *The effects of aging on substantia nigra dopamine neurons.* **The Journal of Neuroscience**, 34 (46), 15133-15134, 2014.
18. **Costa K.M.**, Accorsi-Mendonça D., Moraes D.J., Machado B.H. *Evolution and physiology of neural oxygen sensing.* **Frontiers in Physiology**, 5:302, 2014.
19. Moraes D.J.A., Bonagamba L.G.H., **Costa K.M.**, Costa-Silva J.H., Zoccal D.B., Machado B.H. *Short-term sustained hypoxia induces changes in the coupling of sympathetic and respiratory activities in rats.* **The Journal of Physiology**, 592: 2013–2033, 2014.
20. Granjeiro É.M., Marroni S.S., Dias D.P.M., Bonagamba L.G.H., **Costa K.M.**, do Santos J.C., Oliveira J.A.C., Machado B.H., Garcia-Cairasco N. *Behavioral and cardiorespiratory responses to bilateral microinjections of oxytocin into the central nucleus of amygdala of Wistar rats, an experimental model of compulsion.* **PLoS One**, 9(7): e99284, 2014.
21. Lourenço B.M., **Costa K.M.**, da Silva Filho M. *Voice disorder in cystic fibrosis patients.* **PLoS One**, 9(5): e96769, 2014.
22. **Costa K.M.**, Moraes D.J.A., Machado B.H. *Acute inhibition of glial cells in the NTS does not affect respiratory and sympathetic activities in rats exposed to chronic intermittent hypoxia.* **Brain Research**, 1496, 36-48, 2013.
23. Tejada J.\*, **Costa K.M.\***, Bertti P.\*, Garcia-Cairasco N. *The epilepsies: complex challenges needing complex solutions.* **Epilepsy & Behavior**. 26(3), 212-228, 2013. *\*Joint first authors*
24. da Silva Filho M., Santos D.V., **Costa K.M.** *A new low cost wide-field illumination method for photooxidation of intracellular fluorescent markers.* **PLoS One**, 8(2): e56512, 2013.
25. Santos D.V., **Costa K.M.**, Vaz M.C.G., da Silva Filho M. *Relations between dendritic morphology, spatial distribution and firing patterns in Layer I neurons.* **Brazilian Journal of Medical and Biological Research**, 45(12), 1221-1233, 2012.
26. Costa J.C., **Costa K.M.**, Nascimento J. L. M. *Scopolamine- and diazepam-induced amnesia are blocked by systemic and intraseptal administration of substance P and choline chloride.* **Peptides**, 31(9), 1756-1760, 2010.
27. Machado B.H., Moraes D.J.A., **Costa K.M.** *Highlights in basic autonomic neurosciences: Glia and neuromodulation.* **Autonomic Neuroscience: Basic & Clinical**, 156(1-2), 1-4, 2010.

Links to publications and additional information can be found on:

<https://scholar.google.de/citations?user=ZKL2UG0AAAAJ&hl=en>

<https://orcid.org/0000-0002-5562-6495>

<https://www.researchgate.net/profile/Kaue-Costa>

## RELEVANT LEADERSHIP AND INSTITUTIONAL SERVICE

- 2022-Present **Next Generation Leader, Allen Institute:** showcases Allen Institute projects to key partners, participates in the Allen Institute advisory council
- 2022-Present **Founding Member, Dopamine Society:** volunteer for organizing committees
- 2019-Present **Associate Faculty, H1 connect:** provides post-hoc reviews of key papers
- 2021-2023 **Co-Director, Baltimore Brain Series:** coordinated the selection process, advertisement, schedule, and hosted talks for a competitive seminar series
- 2020-2023 **Member, “Return to Physical Workspaces” committee, NIDA IRP:** represented trainee interests, coordinated surveys, and voted on COVID-19 safety policies (*Awarded NIDA Directors Award of Merit for Collaboration*)
- 2019-2022 **Member, NIDA Postdoc Advisory Board:** advocated for trainee interests
- 2018-2021 **Organizing committee member, Baltimore Brain Series:** voted in the selection process, organized talks, and lead discussions for a competitive seminar series
- 2019-2020 **Reviewer, NIDA Summer Research Internship Program:** judged applications for a competitive educational scholarship program
- 2020 **Poster judge, NIH Postbac Poster Day:** judged trainee poster presentations
- 2019 **Poster judge, NIDA Summer Internship Poster Day:** judged trainee poster presentations
- 2012-2014 **Student representative, MPI-BR student activity organization committee:** organized community building events and advocated for student interests
- 2007-2008 **Member, Biological Sciences student union, Federal University of Pará:** organized community building events, coordinated student card production and allocation, advocated for student interests
- 2007 **Student volunteer, International Color Vision Society Symposium:** participated in the organization of the annual meeting of the society
- 2006 **Student volunteer, Brazilian Society for the Advancement of Science:** participated in the organization of the annual meeting of the society

## PEER REVIEW SERVICE

**Journals:** Current Biology, Neuron, PLOS Biology, eLife, eNeuro, Current Opinion in Behavioral Sciences, Progress in Neurobiology, Cell Reports, Neuropsychopharmacology, Brain Structure and Function, Journal of Neurophysiology, Behavioral Neuroscience, Ageing Research Reviews, iScience, Nature\*, PNAS\*, Nature Neuroscience\*, Nature Communications\*, Nature Reviews Neuroscience\*, Frontiers in Neural Circuits\*, Brazilian Journal of Medical and Biological Research\*

**Grants:** Human Frontier Science Program, Helmholtz Association of German Research Centers\*, DFG Emmy Noether Programme\*

\*Co-reviewer

## RELEVANT COURSES AND PROFESSIONAL TRAINING

- 2021 **Genome Editing with CRISPR,** NIH/FAES, Bethesda, MD, USA
- 2014 **Ion Channel and Synaptic Transmission Summer Course,** Cold Spring Harbor Laboratory, Cold Spring Harbor, NY, USA
- 2013 **Writing in the Sciences;** Stanford University, online course, USA
- 2009 **Physiology Summer Course,** School of Medicine of Ribeirão Preto, University of São Paulo, Ribeirão Preto, Brazil
- 2009 **Comparative Physiology Winter Course,** Institute of Biosciences, University of São Paulo, São Paulo, Brazil

## INVITED TALKS AND LECTURES

- 2023 **INCEPT seminar series**, Harvard Medical School, Cambridge, MA, USA
- 2022 **Institutional Seminar**, Cellular Physiology Institute, Universidad Nacional Autónoma de México, virtual, Mexico
- 2022 **Invited talk**, Department of Psychology, Concordia University, Montreal, Canada
- 2022 **Early Career Colloquium**, Department of Psychology and Brain Sciences, Johns Hopkins University, Baltimore, MD, USA
- 2022 **Brain Week Public Lecture**, Federal University of Pará, virtual, Brazil
- 2022 **Bheja Fry Public Lecture**, The Mind Gala/Project Encephalon, virtual, India
- 2021 **Baltimore Brain Series**, University of Maryland, Baltimore, MD, USA
- 2019 **Invited talk**, Kuchibhotla Lab, Johns Hopkins University, Baltimore, MD, USA
- 2018 **“Fruits of Ethology” Seminar**, Eötvös Loránd University, Budapest, Hungary
- 2017 **Scientific seminar for the Brazilian Consul - Diplomaten-Matinée Brasilien**, Goethe University and the Brazilian Consulate at Frankfurt am Main, Germany
- 2017 **Young Investigators Colloquium**, Interdisciplinary Center for Neuroscience, Frankfurt am Main, Germany
- 2016 **Invited talk**, Schoenbaum Lab, NIDA IRP, Baltimore, MD, USA
- 2016 **Invited talk**, Uchida Lab, Harvard University, Cambridge, MA, USA
- 2016 **Invited talk**, Lammel Lab, UC Berkeley, Berkeley, CA, USA
- 2014 **Invited talk**, Kandel Lab, Columbia University, New York, NY, USA

## PANEL PRESENTATIONS AND DISCUSSIONS

- 2023 **Society for Neuroscience Meeting**, minisymposium talk, Washington D.C., USA (*scheduled*)
- 2023 **Iniciativa Proxima**, career workshop panelist, virtual, USA/Brazil
- 2022 **Dopamine 2022**, panel talk, Montreal, Canada
- 2022 **Gordon Research Seminar - Basal Ganglia**, discussion leader, Ventura, CA, USA
- 2022 **Winter Conference on Brain Research**, panel talk, Snowmass, CO, USA

## CONFERENCE ORAL PRESENTATIONS

- 2022 **Greater Baltimore SFN Chapter Meeting**, oral presentation, Baltimore, MD, USA
- 2022 **Conference on Reinforcement Learning and Decision Making (RLDM)**, oral presentation, Providence, RI, USA
- 2022 **Gordon Research Conference - Basal Ganglia**, poster preview, Ventura, CA, USA
- 2021 **Baltimore Fellows Symposium**, oral presentation, virtual, Baltimore, MD, USA
- 2020 **Brazilian Symposium of Neurosciences**, oral presentation, virtual, Brazil (*Award*)
- 2018 **Gordon Research Seminar - Basal Ganglia**, oral presentation, Ventura, CA, USA
- 2017 **Barcelona Young Neuroscientists Symposium**, oral presentation, Barcelona, Spain (*Travel grant + award*)
- 2014 **German Physiological Society Meeting**, oral presentation, Mainz, Germany

- 2009 **CNPQ Scientific Initiation Program Meeting**, oral presentation, Federal University of Pará, Belém, Brazil
- 2008 **CNPQ Scientific Initiation Program meeting**, oral presentation, Federal University of Pará, Belém, Brazil
- 2007 **CNPQ Scientific Initiation meeting**, oral presentation, Federal University of Pará, Belém, Brazil
- 2004 **International Migratory Birds Day meeting**, oral presentation, Belém, Brazil

#### **CONFERENCE POSTER PRESENTATIONS**

- 2022 **Conference on Reinforcement Learning and Decision Making (RLDM)**, Providence, RI, USA
- 2022 **Gordon Research Conference - Basal Ganglia**, Ventura, CA, USA (*Award*)
- 2021 **Champalimaud Research Symposium**, virtual, Portugal
- 2021 **Virtual Dopamine (VIDA) Conference**, virtual, USA
- 2021 **NIDA Poster Day**, virtual, USA (*Award*)
- 2020 **SFN Global Connectome Meeting**, virtual, USA (*Award*)
- 2019 **Greater Baltimore SFN Chapter Meeting**, Baltimore, MD, USA (*Award*)
- 2018 **Gordon Research Conference - Basal Ganglia**, Ventura, CA, USA (*Travel grant*)
- 2018 **Rhine-Main Neuroscience Network Meeting**, Oberwesel, Germany (*Award*)
- 2018 **Society for Neuroscience Meeting**, San Diego, CA, USA
- 2017 **Society for Neuroscience Meeting**, Washington DC, USA (*Travel grant + award*)
- 2016 **Society for Neuroscience Meeting**, San Diego, CA, USA
- 2016 **German Physiological Society Meeting**, Lübeck, Germany (*Award*)
- 2014 **Society for Neuroscience Meeting**, Washington DC, USA
- 2012 **Brazilian Symposium of Cardiovascular Physiology**, Goiania, Brazil (*Award*)
- 2011 **Joint Meeting of International Society of Autonomic Neuroscience and American Autonomic Society**, Búzios, Brazil
- 2011 **Brazilian Symposium of Cardiovascular Physiology**, São Paulo, Brazil (*Award*)
- 2011 **Meeting of the Brazilian Federation of Experimental Biology Societies**, Rio de Janeiro, Brazil
- 2009 **Meeting of the Brazilian Federation of Experimental Biology Societies**, Águas de Lindóia, Brazil
- 2009 **National Oceanography Week**, Belém, Brazil
- 2008 **International Brain Research Organization - Latin American Regional Committee Congress of Neurosciences**, Búzios, Brazil
- 2008 **Meeting of the Brazilian Federation of Experimental Biology Societies**, Águas de Lindóia, Brazil (*Award*)
- 2008 **Regional Meeting of the Brazilian Federation of Experimental Biology Societies**, Fortaleza, Brazil