# DR. MARIA ANTONIETTA TOSCHES

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## DEPARTMENTAL AND INSTITUTIONAL AFFILIATIONS

| | |
|---|---|
| 2019 – present | **Assistant Professor, Columbia University**, Department of Biological Sciences (USA)<br>Affiliate Member, Zuckerman Mind Brain and Behavior Institute, Columbia University<br>Member, NeuroTechnology Center, Columbia University |
| 2014 –2019 | **Postdoc, Max Planck Institute for Brain Research**, Frankfurt (DE)<br>Advisor: Dr. Gilles Laurent |
| 2012 – 2014 | **Postdoc, EMBL**, Developmental Biology Unit, Heidelberg (DE)<br>Advisor: Dr. Detlev Arendt |
| 2007 – 2012 | **Graduate student, EMBL and Heidelberg University**, Heidelberg (DE)<br>Advisor: Dr. Detlev Arendt |

## EDUCATION

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|---|---|
| 2007 – 2012 | **Ph.D., EMBL and Heidelberg University**, Heidelberg (DE)<br>Advisor: Dr. Detlev Arendt<br>Thesis committee: J. Wittbrodt, A. Ephrussi, D. Gilmour, H. Steinbeisser<br>Thesis: "Development and function of brain photoreceptors in the annelid *Platynereis dumerilii*"; Grade: 1.0, *magna cum laude* |
| 2002 – 2007 | **Diploma di Licenza, Scuola Normale Superiore**, Pisa (IT)<br>Main subjects: molecular biology and neuroscience, Grade: 70/70 *cum laude* |
| 2005 – 2007 | **Master's Degree in Biomolecular Science and Technology, University of Pisa** (IT)<br>Thesis: "Role of RNA-binding proteins in *Xenopus* retinal development"<br>Grade: 110/110 *cum laude* and distinctions ("abbraccio accademico") |
| 2002 – 2005 | **Bachelor's Degree in Molecular biology, University of Pisa** (IT)<br>Grade: 110/110 *cum laude* |

## HONORS AND AWARDS

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|---|---|
| 2022 | Rita Allen Scholar Award |
| 2022 | John Kendrew EMBL Alumni Award |
| 2020 | McKnight Scholar Award in Neuroscience |
| 2018 | Next Generation Leader, Allen Institute for Brain Science (Seattle, USA) |
| 2018 | Scientific Discovery Award, Max Planck Institute for Brain Research |
| 2018 | *FRM Foundation pour la Recherche Médicale* installation grant (300K euro, declined) |
| 2017 | Poster Presentation Award, Brain Conference "Cortex Evolution and Development" |
| 2016 | Boehringer-Ingelheim Travel Grant (4220 euro) |
| 2007 | EMBL International Ph.D. Program Fellowship |
| 2007 | University of Pisa Gold Medal for outstanding curricular achievements |
| 2002 – 2007 | Scuola Normale Superiore undergraduate scholarship, renewed yearly for 5 years |

## FUNDING

07/2020–06/2023 McKnight Foundation, Scholar Award in Neuroscience
Title: The evolution of gene modules and circuit motifs for cortical inhibition
Role: PI

06/2020–05/2025 NIH/NHGRI 1RM1HG011014-01
Title: Center for integrated cellular analysis.
Role: co-Investigator (PIs: Satija and Landau)

09/2021–08/2024 NSF EDGE
Title: Development of Viral Vectors for Amphibian Gene Delivery and Manipulation
Role: co-PI (with D.Kelley, A.Yamaguchi, L.Sweeney, H.Cline, M.Shein-Idelson)

09/2022–08/2027 Rita Allen Foundation Scholar Award
Title: Expanding neuronal diversity: the generation of new types of neurons in the cerebral cortex
Role: PI

09/2022–09/2027 NIH/NIGMS 1R35GM146973
Title: Molecular and cellular mechanisms underlying the nerve dependence of regeneration
Role: PI

12/2022–11/2027 NIH/NINDS R01NS129997
Title: Neural control of NREM sleep in the medulla
Role: co-Investigator (PI: Y.Peng)

## PUBLICATIONS

**Research articles**

- Woych J, Ortega Gurrola A, Deryckere A, Jaeger E, Gumnit E, Merello G, Gu J, Joven Araus A, Leigh N, Yun M, Simon A, Tosches MA (2022) – "Cell type profiling in salamanders identifies innovations in vertebrate forebrain evolution – ***Science*** 377(6610): 1063 eabp9186

- Hain D, Gallego Flores T, Klinkmann M, Macias A, Ciirdaeva E, Arends A, Thum C, Tushev G, Kretschmer F, Tosches MA*, Laurent G* (2022) – "Molecular diversity and evolution of neuron types in the amniote brain" – ***Science*** 377(6610): 1060 eabp8202
* senior authors

- Deryckere A, Woych A, Jaeger E, Tosches MA (2022) – "Molecular diversity of neuron types in the salamander amygdala and implications for amygdalar evolution" –***Brain Behavior and Evolution*** doi: 10.1159/000527899

- Schede HH, Schneider CG, Stergiadou J, Borm LE, Ranjak A, Yamawaki TM, David FPA, Lönnerberg P, Laurent G, Tosches MA, Codeluppi S, La Manno G. (2021) – "Spatial tissue profiling by imaging-free molecular tomography" – ***Nature Biotechnology***; 39: 968–977

- Norimoto H, Fenk L, Li H-H., Tosches MA, Gallego-Flores T, Hain D, Reiter S, Kobayashi R, Macias A, Arends A, Klinkmann M, Laurent G (2020) – "A claustrum in reptiles and its role in slow-wave sleep" – ***Nature*** 578: 413–418

- Tosches MA#*, Yamawaki TM*, Naumann RK, Jacobi A, Tushev G, Laurent G# (2018) – "Evolution of pallium, hippocampus and cortical cell types revealed by single-cell transcriptomics in reptiles" – ***Science*** 360(6391):881-888
* first authors #co-corresponding authors

- Vopalensky P, Tosches MA, Achim K, Handberg-Thorsager M, Arendt D (2019) – "From spiral cleavage to bilateral symmetry: the developmental cell lineage of the annelid brain" – ***BMC Biology*** 17:81

- Martinez-Vergara H, Bertucci PY, Hantz P, Tosches MA, Achim K, Vopalensky P, Arendt D (2017) – "A whole-organism cellular gene expression atlas reveals conserved cell types in the ventral nerve cord of *Platynereis dumerilii*" – ***Proceedings of the National Academy of Sciences*** 114(23):5878-5885

- Tosches MA#, Bucher D, Vopalensky P, Arendt D#. (2014) – "Melatonin signaling controls circadian swimming in marine zooplankton" – ***Cell*** 159(1):46-57 #co-corresponding authors

- Marlow H, Tosches MA, Tomer R, Steinmetz PR, Lauri A, Larsson T, Arendt D. (2014) – "Larval body patterning and apical organs are conserved in animal evolution" - ***BMC Biology*** 12:7

**Reviews, perspectives, and book chapters**

- Tosches MA. (2021) – "From cell types to an integrated understanding of brain evolution: the case of the cerebral cortex" – ***Annual Review in Cell and Developmental Biology***. 37:22.1–22.23

- Tosches MA. (2021) – "Different origins for similar brain circuits" – ***Science***. Feb 12;371(6530):676-677.

- Yuste R, Hawrylycz M, Aalling N, Aguilar-Valles A, Arendt D, Armañanzas R, Ascoli GA, Bielza C, Bokharaie V, Bergmann TB, Bystron I, Capogna M, Chang Y, Clemens A, de Kock CPJ, DeFelipe J, Dos Santos SE, Dunville K, Feldmeyer D, Fiáth R, Fishell GJ, Foggetti A, Gao X, Ghaderi P, Goriounova NA, Güntürkün O, Hagihara K, Hall VJ, Helmstaedter M, Herculano-Houzel S, Hilscher MM, Hirase H, Hjerling-Leffler J, Hodge R, Huang J, Huda R, Khodosevich K, Kiehn O, Koch H, Kuebler ES, Kühnemund M, Larrañaga P, Lelieveldt B, Louth EL, Lui JH, Mansvelder HD, Marin O, Martinez-Trujillo J, Chameh HM, Mohapatra AN, Munguba H, Nedergaard M, Němec P, Ofer N, Pfisterer UG, Pontes S, Redmond W, Rossier J, Sanes JR, Scheuermann RH, Serrano-Saiz E, Staiger JF, Somogyi P, Tamás G, Tolias AS, Tosches MA, García MT, Wozny C, Wuttke TV, Liu Y, Yuan J, Zeng H, Lein E. (2020) – "A community-based transcriptomics classification and nomenclature of neocortical cell types" – ***Nature Neuroscience*** 23(12):1456-1468

- Tosches MA, Laurent G (2019) – "Evolution of neuronal identity in the cerebral cortex" – ***Current Opinion in Neurobiology*** 56: 199-208

- Silver D, Rakic P, Grove EA, Haydar TF, Hensch TK, Huttner WB, Molnar Z, Rubenstein J, Sestan N, Stryker MP, Sur M, Tosches MA, Walsh CA (2019) – "Evolution and Ontogenetic Development of Cortical Structures" – in ***The Neocortex***, edited by W. Singer, T. Sejnowski and P. Rakic, Strüngmann Forum Reports, The MIT Press

- Martinez-Cerdeño V, Garcia-Moreno F, Tosches MA, Csillag A, Manger PR, Molnar Z (2017) – "Update on forebrain evolution: From neurogenesis to thermogenesis" – ***Seminars in Cell and Developmental Biology*** S1084-9521(17)30211

- Tosches MA (2017) – "Developmental and genetic mechanisms of neural circuit evolution" – ***Developmental Biology*** 431(1): 16-25

- Laurent G, Fournier J, Hemberger M, Müller C, Naumann RK, Ondracek JM, Pammer L, Reiter S, Shein-Idelson M, Tosches MA, Yamawaki TM. (2016) – "Cortical evolution: introduction to the reptilian cortex" – in ***Micro-, Meso- and Macro-Dynamics of the Brain***, Edited by G. Buzsaki and Y. Christen, Research and Perspectives in Neurosciences, Cham (CH): Springer

- Naumann RK, Ondracek JM, Reiter S, Shein-Idelson M, Tosches MA, Yamawaki TM, Laurent G. (2015) – "The reptilian brain" – ***Current Biology*** 25(8):R317-21

- Arendt D, Tosches MA, Marlow H. (2016) – "From nerve ring to nerve cord and brain - evolution of the nervous system" – ***Nature Reviews Neuroscience*** 17(1), 61-72

- Tosches MA, Arendt D. (2013) – "The bilaterian forebrain: an evolutionary chimaera" – ***Current Opinion in Neurobiology*** 23(6):1080-9

## PRESENTATIONS

* postponed from 2020 because of COVID-19

**Invited talks**

2024 Seminar, Vollum Institute – Portland (USA)
2023 Seminar, MIT, Molecular and Cellular Neuroscience Seminar Series – Cambridge (USA)
Seminar, University of Kentucky, Department of Biology – Lexington (USA)
Seminar, Burke Neurological Institute, Weill Cornell Medicine – White Plains (USA)
Conference "AXON 2023: Development, Plasticity and Regeneration of Neural Circuits" – Altea, Alicante (SP)
Conference "Structure, function, and development of neural circuits", UCI Center for Neural Circuit Mapping, UC Irvine – Irvine (USA)
*Gordon Research Conference "Neuroethology: Behavior, Evolution and Neurobiology" – Mount Snow (USA)
Meeting, "Developmental Biology in the 21st Century", Fondation des Treilles – Tourtour (FR)
McKnight Conference on Neuroscience – Aspen (USA)
**Keynote Speaker**, Department of Neuroscience Retreat, University of Texas Southwestern Medical Center (USA)
Seminar, Developmental and Stem Cell Biology Colloquium, Duke University – Durham (USA)
Janelia Conference "Neuro-Evo: A Comparative Approach to Cracking Circuit Function III" – Janelia Research Campus – Ashburn (USA) – **co-organizer**
Seminar, Department of Biology, UPenn – Philadelphia (USA)
Seminar, Distinguished Speaker Lecture Series, Max Planck Institute for Biological Intelligence – Munich (DE)
Kavli NSI Symposium, Rockefeller University – New York (USA)
2022 Seminar, SUNY Downstate – New York (USA)
Seminar, Salamander League (virtual)
International Salamander meeting (hybrid)
*Gordon Research Conference "Neural Development" – Newport (USA)
Brains Through Time reading club (virtual) [youtube link]
10th European Conference on Comparative Neurobiology – Prague (CZ) - **Scientific committee member**
Conference "Neurogenesis in health and disease" – Ascona (CH)
*Cortical Development Conference, "Neural Stem Cells to Neural Circuits" – Milazzo (IT)
*Symposium "Neural Dynamics Across Species: Looking Back and Thinking Ahead" – Frankfurt (DE)
*8th meeting of the European society for Evolutionary Developmental Biology – Naples (IT) (declined for schedule conflict)
2021 Brains Through Time reading club (virtual) [youtube link]
Karger Workshop – J B Johnston Club, satellite of SfN Meeting (virtual)
NIH Neuroscience Seminar Series – Bethesda (USA)
3rd Latin American School & Symposium on Brain & Mind Evolution (virtual)
**Trainee-sponsored seminar**, Memorial Sloan Kettering Cancer Center – New York (USA)
EMBL Symposium "Identity and Evolution of Cell Types" – Heidelberg (DE) – **Co-organizer**
Developing Neural Circuits Course, OIST Okinawa (JP)
Seminar, Brown University – Providence (US)
Society for Neuroscience (SfN) Global Connectome (virtual)
2020 Seminar, University of Massachusetts – Amherst (USA)
Virtual Seminar on WorldWideNeuro.com (global, hosted by Geneva University) [youtube link]
Seminar, New York University, Neuroscience Institute – New York (USA)
Seminar, "Evolution at Columbia" supergroup, Columbia University
Seminar, Instituto de Neurociencias de Alicante – Alicante (ES)
2019 Allen Institute Showcase Symposium 2019 – Seattle (USA) [youtube link]
Seminar, Brooklyn College, CUNY – New York (USA)
University Seminar in Integrative Animal Behavior, Columbia University – New York (USA)
EMBO/EMBL Symposium "Identity and Evolution of Cell Types" – Heidelberg (DE)
9th European Conference on Comparative Neurobiology – Murcia (SP) – **Keynote speaker**
2018 FENS-Brain Conference "The Necessity of Cell Types for Brain Function" – Copenhagen (DK)
Seminar, Department of Biology, University of Pisa – Pisa (IT)
Symposium on "Neuronal Circuit Research", Friedrich Miescher Institute – Basel (CH)
SfN virtual conference "Advances in Single Cell Genomics to Study Brain Cell Types"

Janelia Conference "Neuro-Evo: A Comparative Approach to Cracking Circuit Function II" – Janelia Research Campus – Ashburn (USA)
Ernst Strüngmann Forum "Cerebral cortex 3.0" – Frankfurt (DE)
Seminar, Institute of Science and Technology (IST) – Vienna (AT)
2017 Seminar, Department of Biological Sciences, Columbia University – New York (USA)
FENS-Brain Conference "Cortex Evolution and Development" – Copenhagen (DK)
Seminar, Institute de Biologie de l'Ecole Normale Superieure – Paris (FR)
2016 Seminar, Department of Neuroscience and Physiology, New York University – New York (USA)
6th meeting of the European society for Evolutionary Developmental Biology – Uppsala (SE)
Janelia Conference "Neuro-Evo: A Comparative Approach to Cracking Circuit Function" – Janelia Research Campus, Ashburn (USA)
8th European Conference on Comparative Neurobiology – Munich (DE)

**Other presentations (talks selected from abstracts and posters)**

2017 EMBL-EMBO Symposium "Neural Circuits in the Past, Present and Future" – Heidelberg (DE) (talk)
Janelia Conference "Control of Neuronal identity II" – Janelia Research Campus (USA) (poster)
2015 "Single Cell Genomics" Conference – Utrecht (NL) (poster)
2014 EMBO Workshop "Decoding neural circuit structure and function" – Istanbul (TR) (poster)
Fifth meeting of the European society for Evolutionary Developmental Biology – Vienna (AT) (talk)
2013 CDB Symposium "The making of a vertebrate" – RIKEN, Kobe (JP) (talk)
2012 Fourth meeting of the European society for Evolutionary Developmental Biology – Lisbon (PT) (talk)
CNRS Monod Conference "Emergence and evolution of developmental patterns" – Roscoff (FR) (talk)
2011 EMBO Meeting "Frontiers in Sensory Development" – Barcelona (SP) (talk)

## PROFESSIONAL SERVICE

**Scientific Advisory Board**
2018-2021 Allen Institute for Brain Science, Next Generation Leaders council

**Journal Reviewer**
*Science, Nature Review Neuroscience, Current Biology*, *eLife*, *Nature Communications*, *Nature Ecology and Evolution*, *Scientific Reports, Brain Behavior and Evolution.*

**Guest Journal Editor**
*Current Opinion in the Behavioral Sciences, Brain Behavior and Evolution*

**Grant Reviewer**
*European Research Council, National Science Foundation, Einstein Foundation (Berlin), Klaus Tschira Foundation (Heidelberg)*

**Conference Organizer**
2023 Co-organizer (with D. Stern and A. Cardona), "Neuro-Evo: A Comparative Approach to Cracking Circuit Function III", Janelia Research Campus, Ashburn (USA)
2022 Scientific committee member (with Z. Molnar, M. Wullimann, P. Vernier, H. ten Donkelaar, P. Nemec), 10th European Conference on Comparative Neurobiology – Prague (CZ)
2021 Co-organizer (with D. Arendt, G. Wagner and C. Baker), "Identity and Evolution of Cell Types" – Heidelberg (DE)
2020 Co-organizer (with H. Cline, L. Sweeney, A. Yamaguchi, D. Kelley and M. Shein-Idelson), "Expanding the species range of the vertebrate viral toolbox", Marine Biological Laboratory, Woods Hole (USA) (postponed because of Covid-19)
2008 Co-organizer, 10th EMBL International Ph.D. Symposium "Decision making in biology", Heidelberg (DE)

**Departmental and University Service**

Ongoing:
Master's Committee, Department of Biological Sciences (2022-2023)
Faculty Search Committee, Department of Biological Sciences (2022-2023)
Seminar Selection Committee, Columbia Neuroscience Seminars (CNS) (2021-2023)

Completed:
Seminar Committee, Department of Biological Sciences (2019-2022)
Website and Outreach Committee, Department of Biological Sciences (2019-2022)
Shared Equipment Committee, Department of Biological Sciences (2020-2022)
ZMBBI Leadership Advisory Group (2022)

## MEDIA

**Media coverage (selected)**

2014 Tosches et al 2014:
Covered in "The evolution of sleep: 700 million years of melatonin" by Carl Zimmer, *The New York Times* [link]
Featured also in: Cell (Cell 159(1):9-10), *Nature* "Research Highlights", *Science Signalling* (Sci. Signal. 7, ec278), Faculty of 1000, Science News, Inside Science, Pikaia and others.

2018 Tosches et al 2018: covered in several online news outlets (e.g. Phys.org, SciTechDaily.com)
Vopakensky et al 2018: preLights, The Company of Biologist [link]

2022 Woych et al 2022:
Covered in "Gene expression in neurons solves a brain evolution puzzle" by Allison Whitten, *Quanta Magazine* [link] highlighted in *Science*; featured in Nature Reviews Genetics (Minton 2022) and by a perspective piece in *Science* (Faltine-Gonzalez and Kebschull (2022) 377(6610):1043-1044), and other science news outlets.

Hain et al 2022: featured in *Nature Reviews Genetics* (Minton 2022) and by a perspective piece in *Science* (Faltine-Gonzalez and Kebschull (2022) 377(6610):1043-1044), and other science news outlets.

"Studying brain evolution: from worms to newts" by Ivy Kupec, EMBLetc: online magazine of the European Molecular Biology Laboratory [link]

Rosalind Franklin Society annual meeting (virtual) – "Awards: a window or just window dressing?"[youtube link]

**Media commentary (selected)**
2019 "Albino lizards are the world's first genetically modified reptiles" by Michael Le Page, *New Scientist* [link]
2021 "Sponge genes hint at the origin of neurons and other cells" by Viviane Callier, *Quanta Magazine* [link]

## SCIENCE OUTREACH

**Public outreach event**
2022 Saturday Science in collaboration with CUNO (Columbia University Neuroscience Outreach)

**Classes for high-school students**
2015-2016 Design of the PCR module for the Teaching Lab of the MPI for Brain Research
Teaching basic molecular biology techniques (enzyme digestions, PCR, agarose gel electrophoresis) to high-school students in the Teaching Lab of the MPI for Brain Research

**Public lectures**

Jun 27th, 2017 Public lecture "From genes to mind: the mystery of brain evolution", Bar Cafuchico, Frankfurt
Jun 8th, 2018 Public lecture "From genes to mind: the mystery of brain evolution", Frankfurt Night of Science
Sept 13th, 2018 Public lecture "From genes to mind: the mystery of brain evolution", Café Crumble, Frankfurt

**Art performance**

Jun 3rd, 2016 Acting in "The Max Planck Horror Picture Show", Frankfurt Night of Science

**Podcast**

Oct 13th, 2020 Guest of the science podcast "This Week in Neuroscience (TWiN)", episode "A dollar per neuron" [link]

## TEACHING

Since at Columbia

- Instructor, BIOL UN3019: Brain Evolution, Columbia University (Spring 2022, Spring 2023)
- Guest lecturer, G4340 Survey in Neuroscience I, NB&B Graduate Program, Columbia University (2022)
- Guest lecturer, Developing Neural Circuits Course, OIST, Okinawa, Japan (2021)
- Guest lecturer, Research Foundations in Genetics and Genomics, University of Chicago (2020)
- Guest lecturer, GR6055: Survey Neuroscience II, NB&B Graduate Program, Columbia University (2020, 2021, 2022)
- Guest lecturer, NSBV BC 1001: Introduction to Neuroscience, Barnard College (2020, 2021)
- Guest lecturer, BIOL GR9301: Pre-research seminar, Biological Sciences PhD program, Columbia University (2019, 2020, 2022)

Before Columbia

- Lecturer and lab practicals for the "Molecular neurobiology" class, IMPRS Max Planck Graduate program (2016 and 2017)
- Lecturer for the EMBL Predoc Course, Basic Biology Module (2011)
- Lab practicals for the EMBL Predoc Course, Developmental Biology Module (2009)
- Teaching assistant, EMBO-Zoonet Practical Course "Molecular approaches to evolution and development" – Kristineberg Marine Research Station, Sweden (2008)

## MENTORING

Tosches lab at Columbia University:

- Staff Associate: Jamie Woych (from October 2019)
- Graduate Students:
    - Eliza Jaeger (Columbia Biological Sciences) from Jan 2020, **NSF GRFP Fellowship**
    - Alonso Ortega-Gurrola (Columbia Neurobiology and Behavior) from Jan 2020, **Fulbright Fellowship**
    - Elias Gumnit (Columbia Biological Sciences) from Apr 2021, **NSF GRFP Fellowship**
    - Nicholas Jianming Chua (Columbia Biological Sciences) from Apr 2022
- Postdocs
    - Lu Xu (PhD, Columbia University), from 2021 (joint with Stuart Firestein and Elizabeth Hillman), **Helen Hay Whitney Fellowship**
    - Astrid Deryckere (PhD, Leuven, Belgium), from Feb 2021, **EMBO Long-Term Fellowship**
    - Andrew Matheson (PhD, NYU), from Dec 2021
    - Giacomo Gattoni (PhD, University of Cambridge), from March 2023
- Undergraduates
    - Dreyton Amador (Columbia Biomedical Engineering), May 2021- September 2022
    - Kimberly Tufton (Columbia Neurobiology), Summer 2021
    - Boldizsar Jekely (Columbia Environmental Biology), Fall 2021-Spring 2022
    - Vincent Zhao (Columbia Biomedical Engineering), Spring 2023-

- Rotation students: Xinyue Chen, Jiacheng Gu, Gianluca Merello, Britt Bistis, Lina Ruiz, Sherry Li, Isabella Succi, Timothy Chang

Before Columbia
At EMBL: supervision and mentoring of two undergraduate students (University of Heidelberg)
At MPI for Brain Research: supervision and mentoring of:

- Helena Dominguez-Moreno (Goethe University, 9 months, earned Ph.D. at LMU Munich)
- Ariel Jacobi (UPenn, 1 year, now MD/Ph.D. student at UC Davis, co-author in Tosches et al *Science* 2018)
- David Hain (Goethe University, Master student, Nov 2017 - June 2019; now Ph.D. student at MPI for Brain Research, first author in Hain, Gallego-Flores et al *Science* 2022)
- Tatiana Gallego-Flores (Research Assistant, Nov 2017 - June 2019; now EMBO Long-term postdoctoral fellow at Achucarro Basque Center for Neuroscience (SP); first author in Hain, Gallego-Flores et al *Science* 2022)
- Helena Winterberg (University of Heidelberg, Master student, Nov 2018- May 2019, now Ph.D. student in Paris)

**Thesis Defense Committee**
Ellie Hozhabri, 2023 (New York University, Long lab)
Marissa Applegate, 2023 (Columbia University, Aronov lab)
Yow-Tyng Yeh, 2022 (Columbia University, Woolley lab)
Tessa Marie Tekieli, 2022 (Columbia University, Hobert lab)
Molly Reilly, 2021 (Columbia University, Hobert lab)
Jonathan Lovas, 2020 (Columbia University, Yuste lab)
Emily Berghoff, 2019 (Columbia University, Hobert lab)

**Qualifying Exam Committee**
Robert Aguilar, 2022 (Columbia University, Hobert lab)
Justin Burdge, 2021 (Columbia University, Abdus-Saboor lab)
Yasmin Ramadan, 2021 (Columbia University, Hobert lab)
Lena Annika Street, 2020 (Columbia University, Jovanovic lab)
Aaron Weston Limoges, 2019 (Columbia University, Anacker lab)

**Thesis Advisory Committee**
Robert Aguilar, 2023 (Columbia University, Hobert lab)
Thamari Kapuruge, 2023 (LMU Munich, Keays lab)
Yasmin Ramadan, 2022 (Columbia University, Hobert lab)
Zhenhao Guo, 2022 (Columbia University, Chalfie lab)
Justin Burdge, 2022 (Columbia University, Abdus-Saboor lab)
Lena Annika Street, 2021-2022 (Columbia University, Jovanovic lab)
Molly Reilly, 2020 (Columbia University, Hobert lab)
Jonathan Lovas, 2019 (Columbia University, Yuste lab)
Tessa Marie Tekieli, 2019-2021 (Columbia University, Hobert lab)
Aaron Weston Limoges, 2020-2023 (Columbia University and NIH, Tejeda lab)
Felix Simon, 2019-2022 (New York University, Desplan lab)
Maria Tatiana Gallego-Flores, 2019-2022 (MPI for Brain Research, Laurent lab)