DR. MARIA ANTONIETTA TOSCHES

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DEPARTMENTAL AND INSTITUTIONAL AFFILIATIONS

2025 – present	**Associate Professor, Columbia University**, Department of Biological Sciences (USA)
2019 – 2025	**Assistant Professor, Columbia University**, Department of Biological Sciences (USA)
2019 – present	Affiliate Member, Zuckerman Mind Brain and Behavior Institute, Columbia University
	Member, NeuroTechnology Center, Columbia University
2014 –2019	**Postdoc, Max Planck Institute for Brain Research**, Frankfurt (DE) Advisor: Dr. Gilles Laurent
2012 – 2014	**Postdoc, EMBL**, Developmental Biology Unit, Heidelberg (DE) Advisor: Dr. Detlev Arendt

EDUCATION

2007 – 2012	**Ph.D., EMBL and Heidelberg University**, Heidelberg (DE) Advisor: Dr. Detlev Arendt; Thesis committee: J. Wittbrodt, A. Ephrussi, D. Gilmour, H. Steinbeisser; 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) 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) Thesis: "Role of RNA-binding proteins in *Xenopus* retinal development" Grade: 110/110 *cum laude* and distinctions ("abbraccio accademico")
2002 – 2005	**Bachelor's Degree in Molecular biology, University of Pisa** (IT) Grade: 110/110 *cum laude*

HONORS AND AWARDS

2025	MIND Prize, Pershing Square Foundation
2023	Ben Barres Early Career Acceleration Award, Chan Zuckerberg Initiative
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

Since the start of my faculty position in 2019, I raised over 7 million dollars of funding from federal agencies (NIH, NSF) and private foundations.

Current

05/2025–03/2030 U01 NIH BRAIN Initiative Armamentarium U01MH139723, Title: "RNA Programmable and Scalable Brain Cell Type Tools Across Vertebrates", Role: co-Investigator (PIs: Huang, Chen, Peng)

05/2025–04/2028 MIND Prize, Pershing Square Foundation; Title: "Understanding brain resilience: the interplay of plasticity and regeneration"; Role: PI

12/2023–11/2027 Ben Barres Career Acceleration Award, Chan Zuckerberg Initiative; Title: "Brain resilience and astrocyte states across species"; Role: PI.

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

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.

Completed

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

06/2020–05/2024 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).

04/2025–03/2026 Research Initiatives in Science and Engineering (RISE), seed funding from Columbia University; Title: "Machine-learning based framework to identify the spatial drivers of brain regeneration; Role: PI (with B. Dumitrascu)

Fellowships to Tosches lab trainees

Graduate students: NSF GRFP (Eliza Jaeger, Elias Gumnit), NIH F31 (Nicholas J. Chua); Postdocs: Helen Hay Whitney Fellowship (Dr. Lu Xu), EMBO Long Term Fellowship (Dr. Astrid Deryckere, Dr. Lucia Del-Valle-Anton); Revson Fellowship (Dr. Giacomo Gattoni)

PUBLICATIONS

underlined: Tosches lab members;
corresponding authors; * co-first authors

Research Articles

2026 Ortega-Gurrola A, Kalaora M, Amador D, Woych J, Tosches MA# (2026) – "Glial cell states bias the regeneration of neuron types across the newt life cycle" – ***bioRxiv*** 2026.05.26.728055

Gumnit E, Gattoni G, Woych J, Deryckere A, Bhattarai P, Gillis JA, Kizil C, Tosches MA# (2026) – "Evolutionary origins and transcriptomic innovations of vertebrate Cajal-Retzius Cells" – ***Current Biology*** 36(9):2397-2412.e7

Gong C, Affatato P, Fay M, Guttikonda SR, O'Connor NJ, Noble E, Heal M, Haydock B, Mapa R, De La Cruz ED, Gattoni G, Kowalko JE, Tosches MA, Gerfen CR, Hen R, Makinson CD, Hibshoosh H, Glaser J, Tomer R# (2026)

– "Hybrid Solid-Liquid Optics Enable Scalable, High-Resolution, Multi-Immersion Light-Sheet Microscopy" – *bioRxiv* 2025.11.02.685475 ***Nature Biotechnology*** in press

2025 Zeppilli S, Ortega Gurrola A, Demetci P, Brann D, Attey R, Zilkha N, Kimchi T, Datta SR, Singh R, Tosches MA, Crombach A#, Fleischmann A# (2025)– "Single-cell genomics of the mouse olfactory cortex reveals contrasts with neocortex and ancestral signatures of cell type evolution" – ***Nature Neuroscience*** May;28(5):937-948

Jaeger ECB*, Vijatovic D*, Deryckere A*, Zorin N, Nguyen AL, Ivanian G, Woych J, Arnold RC, Ortega-Gurrola A, Shvartsman A, Barbieri F, Toma FA, Cline HT, Shay TF, Kelley DB, Yamaguchi A, Shein-Idelson M, Tosches MA#, Sweeney LB# (2025) – "Adeno-Associated Viral Tools to Trace Neural Development and Connectivity Across Amphibians" – ***Developmental Cell*** 60, 1-19

2023 Deryckere A*, Woych A*, Jaeger E, Tosches MA# (2023) – "Molecular diversity of neuron types in the salamander amygdala and implications for amygdalar evolution" – ***Brain Behavior and Evolution*** 98(2):61-75

2022 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

2021 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

2020 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

2019 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

2018 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

2017 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

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

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, Book Chapters

2026 Gattoni G, Ortega-Gurrola A, Chua NJ and Tosches MA# (2026) – "Evolution of neuronal cell types in vertebrate brains" – in ***Evolution of Nervous Systems***, Third edition, Volume 1, edited by S. Herculano-Houzel and J. Kaas, Academic Press

2025 Gattoni G and Tosches MA (2025)– "Constrained roads to complex brains" – ***Science*** 387,716-717

Matheson A and Tosches MA (2025) – "Quick guide: Iberian ribbed newts" – ***Current Biology***, 35 (2), R49-R51

2024 Colonna M#, Konopka G#, Liddelow S#, Nowakowski T#, Awatramani R, Bateup H, Cadwell C, Caglayan E, Chen J, Fossati V, Gillis J, Kampmann M, Krienen F, Marsh S, Monje-Diesseroth M, O'Dea MR, Patani R, Pollen A, Quintana F, Scavuzzo M, Schmitz M, Sloan S, Tesar P, Tollkuhn J, Tosches MA, Werner J, Bayraktar O#, Gokce

O#, Habib N# (2024) – "Implementation and validation of single cell genomics experiments" – ***Nature Neuroscience*** 27, 2310–2325

2023 Tosches MA, Lee HJ (2023) – "Cellular atlases of the entire mouse brain" – ***Nature*** 624 (7991): 253-255

Gumnit E, Tosches MA# (2023) – "A cell atlas of the lamprey brain" – ***Nature Ecology and Evolution*** 7: 1591-1592

2021 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.

2020 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

2019 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

2017 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

2016 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

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

2015 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

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

PRESENTATIONS

Invited talks

2027 **Keynote Speaker**, Neuroscience Day 2027 Dartmouth College – Hanover (USA)
2026 Lake Conference "Comparative and evolutionary neuroscience" – Seattle (USA)
Seminar, Duke Neurobiology Seminar Series, Duke University – Durham (USA)
Symposium, Department of Fundamental Neurosciences, University of Lausanne – Lausanne (CH)

Gordon Research Conference "Neural Development" – Newport (USA)
Keynote Lecture, Emerging Leaders in Regeneration Biology and Development Course, MDI Biological Laboratory – Bar Harbor (USA)
FENS Forum 2026 International Neuroscience Conference – Barcelona (ES)
Seminar, Deep Time Cognition series (virtual)
Seminar, Department of Developmental Biology, Washington University in St. Louis – St. Louis (USA)

2025 Society for Neuroscience meeting – San Diego (USA)
Seminar, Duke University, Neuroscience Seminar Series – Durham (USA)
Seminar, University of Chicago, Neuroscience Seminar Series – Chicago (USA)
Keynote speaker, AXON2025: Development, Plasticity and Regeneration of Neural Circuits – Rotterdam (NL)
Seminar, The Integrative Biology of Brain Evolution (TIBBE) Network (virtual, worldwide audience)
Seminar, ETH BSSE – Basel (CH)
Seminar, Center for Integrative Genomics, University of Lausanne – Lausanne (CH)
11th European Conference on Comparative Neurobiology (ECCN) – Alicante (SP)
Seminar, Cornell University, Department of Neurobiology and Behavior – Ithaca (USA)
Presidential Lecture, Simons Foundation, Flatiron Institute – New York (USA) [youtube link]
CZI Neuroscience Meeting 2025 – San Jose (USA)
Seminar, VIB Center for Brain and Disease Research – Leuven (BE)

2024 Janelia Conference "Developmental Specification of Complex Behaviors" – Janelia Research Campus (USA)
Rita Allen Scholars Symposium 2024 – Princeton (USA)
7th Bonn Brain^3 Conference: States - Behaviour, Neural Circuits and Codes – Bonn (DE)
EMBL 50th anniversary scientific symposium "50 years EMBL: From atoms to ecosystems - a new era in life sciences" – Heidelberg (DE)
Seminar, Max Planck Institute for Neurobiology of Behavior - Caesar – Bonn (DE)
CZI ECA New Investigator Introduction Series (virtual)
Seminar, John Hopkins University, Department of Biomedical Engineering – Baltimore (USA)

2023 Seminar, MIT, Molecular and Cellular Neuroscience Seminar Series – Cambridge (USA)
Seminar, Boston University, Center for Systems Neuroscience – Boston (USA)
Seminar, Harvard University, Center for Brain Science – Cambridge (USA)
Seminar, Zuckerman Institute, Columbia University – New York (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)
Seminar, University of Cambridge, Evo-Devo Seminar Series – Cambridge (UK) (virtual)
Keynote Speaker, Department of Neuroscience Retreat, University of Texas Southwestern Medical Center (USA)
Janelia Conference "Neuro-Evo: A Comparative Approach to Cracking Circuit Function III" – Janelia Research Campus – Ashburn (USA) – **co-organizer**
Seminar, Developmental and Stem Cell Biology Colloquium, Duke University – Durham (USA)
Seminar, Department of Biology, UPenn – Philadelphia (USA)
Keynote Lecture, 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 (ECCN) – 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)

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)
Keynote speaker, 9th European Conference on Comparative Neurobiology (ECCN) – Murcia (SP)

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 (ECCN) – Munich (DE)

Other presentations (talks selected from abstract 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, Nature Review Neuroscience, Current Biology, *eLife*, *Nature Communications*, *Nature Ecology and Evolution*, *Science Advances, Scientific Reports, PNAS, Brain Behavior and Evolution*.

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

Grant Reviewer
NIH, NSF, European Research Council, 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 (2022-2025)

Completed:
Faculty Search Committee, Department of Biological Sciences (2022-2024)
Mentoring working group (2023-2024)
Seminar Selection Committee, Columbia Neuroscience Seminars (CNS) (2021-2023)
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)

Thesis Defense Committee Member – External member
Clothilde Ferreira, 2026 (University of Geneva, Jabaudon/Fievre lab)
Felix Simon, 2023 (New York University, Desplan lab)
Stephanie Marcus, 2023 (Rockefeller University, Jarvis lab)
Ellie Hozhabri, 2023 (New York University, Long lab)

Thesis Defense Committee Member – Columbia University
Sergio Bernal-Garcia, 2026 (Columbia University, Polleux lab)
Yasmin Ramadan, 2025 (Columbia University, Hobert lab)
Lena Annika Street, 2025 (Columbia University, Jovanovic lab)
Rahim Hashim, 2025 (Columbia University, Salzman lab)
Zhenhao Guo, 2025 (Columbia University, Chalfie lab)
Justin Burdge, 2024 (Columbia University, Abdus-Saboor lab)
Aaron Weston Limoges, 2024 (Columbia University, Tejeda lab)
Qianyun Zhang, 2024 (Columbia University, Sawtell 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 Member
Hayne Wang, 2026 (Columbia University, Zuker lab)
Erica Hurley, 2026 (Columbia University, Wichterle lab)
Njeri Sparman, 2025 (Columbia University, Hobert lab)
Luke Geiger, 2025 (Columbia University, Hobert lab)
Wesley Yu-Young Tsai, 2025 (Columbia University, Abdus-Saboor lab)
Preston Sheng, 2024 (Columbia University, Abdus-Saboor lab)
Xiaoyun Li, 2024 (Columbia University, Aronov lab)
Gianluca Merello, 2023 (Columbia University, Baldwin lab)
Akanksha Bhat, 2023 (Columbia University, Andolfatto and Przeworski labs)
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, Tejeda lab)

Thesis Advisory Committee Member
Njeri Sparman, 2025- (Columbia University, Hobert lab)
Luke Geiger, 2025- (Columbia University, Hobert lab)
Wesley Yu-Young Tsai, 2025- (Columbia University, Abdus-Saboor lab)
Preston Sheng, 2025- (Columbia University, Abdus-Saboor lab)
Mateja Soretic, 2024- (ETH Zurich, Treutlein lab)
Xiaoyun Li, 2025- (Columbia University, Aronov lab)
Gianluca Merello, 2024- (Columbia University, Baldwin lab)
Chlotilde Ferreira, 2024-2026 (University of Geneva, Fievre lab)
Robert Aguilar, 2023- (Columbia University, Hobert lab)
Thamari Kapuruge, 2023- (LMU Munich, Keays lab)
Yasmin Ramadan, 2022-2024 (Columbia University, Hobert lab)
Zhenhao Guo, 2022-2024 (Columbia University, Chalfie lab)
Justin Burdge, 2022-2024 (Columbia University, Abdus-Saboor lab)
Lena Annika Street, 2021-2025 (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, 2020-2024 (Columbia University and NIH, Tejeda lab)
Felix Simon, 2019-2023 (New York University, Desplan lab)
Maria Tatiana Gallego-Flores, 2019-2022 (MPI for Brain Research, Laurent lab)

TEACHING

Since at Columbia
- Instructor, BIOL UN3019: Brain Evolution, Columbia University (Spring 2022, 2023, 2024)
- Guest lecturer, BIOLW3005 Neurobiology II, Columbia University (2023)
- Guest lecturer, G4340 Survey in Neuroscience I, NB&B Graduate Program, Columbia University (2022, 2023, 2024)
- 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, 2023)

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, current lab members

Postdocs
- Andrew Matheson (PhD, NYU), since Dec 2021. McKnight Foundation Doupe Fellow (2026), International Society for Neuroethology Young Investigator Award (2026)
- Giacomo Gattoni (PhD, University of Cambridge), since March 2023. Revson Postdoc Fellowship
- Lucia Del Valle Anton (PhD, Instituto de Neurociencias, Miguel Hernández University - CSIC, Alicante, Spain), since Jan 2025. EMBO Long-Term Postdoc Fellowship

Graduate Students
- Elias Gumnit (Columbia Biological Sciences) since Apr 2021, NSF GRFP Fellowship (09/2022-08/2025).
- Nicholas Jianming Chua (Columbia Biological Sciences) since Apr 2022. NIH NSRA F31 Fellowship (12/2024-11/2027), Charles A. Huebschman Prize (2025)
- Victoria Saltz (Columbia Biological Sciences) since July 2024.
- Pauline Affatato (Columbia Biological Sciences) since July 2025.
- Katharine Courtemanche (Columbia Biological Sciences) since July 2026.

Staff Associate
- Jamie Woych (since October 2019)

Research Assistant
- Mayra Kalaora (since August 2024)

Undergraduate student
- Therese Zinga (Columbia University, BUMP and SURF awardee), since Fall 2024

Tosches lab Alumni

Postdocs
- Lu Xu (PhD, Columbia University), 2021 – Dec 2024 (joint with S. Firestein and E. Hillman), Helen Hay Whitney Fellowship. Currently: postdoc (with E. Hillman), St. Jude Children's Research Hospital, USA
- Astrid Deryckere (PhD, KU Leuven, Belgium), Feb 2021-Aug 2024, EMBO Long-Term Fellowship. Charles Turner Postdoctoral Award (2024). Currently: postdoc, KU Leuven, Belgium.
- Nedah Nemati (PhD, University of Pittsburgh), Presidential Scholar in Society and Neuroscience, co-advised with Darcy Kelley and John Morrison, since Sept 2022. From August 2026: Assistant Professor, Albany Medical College

Graduate Students
- Eliza C. B. Jaeger (Columbia Biological Sciences) Jan 2020 – Dec 2025, NSF GRFP Fellowship (09/2021-08/2024). Charles A. Huebschman Prize (2022), Chinweike Okebe Memorial Award (2021), graduated with distinction. Currently: postdoc, Rockefeller University (Daniel Kronauer's lab).
- Alonso Ortega-Gurrola (Columbia Neurobiology and Behavior) Jan 2020 – Feb 2026, Fulbright Fellowship. Currently: postdoc at NYU (Shane Liddelow's lab)

Undergraduate students
- 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-Summer 2023)
- Lina Habba (NYU – CEGS Summer Undergraduate Research Program, Summer 2023)

- Lekha Masoudi (Columbia University, Summer 2023)
- Nat Spollen (Columbia University, Spring 2024)
- Alisha Aristel (CEGS Summer Undergraduate Research Program, Summer 2024)
- Jackson Cook (Williams College, Summer 2025)

Rotation students
Xinyue Chen, Jiacheng Gu, Gianluca Merello, Britt Bistis, Lina Ruiz, Sherry Li, Isabella Succi, Timothy Chang, Luke Geiger, Hunter Whitbeck, Victoria Saltz, Njeri Sparman, Yanzhe Ma, Erica Hurley, Pauline Affatato, Nastasia Nelson, Johanna de la Cruz, Tate Yawitz, Katharine Courtemanche, Ivanna Ostapchuk, Gabriel Graham, Talya Inbar

Students supervised 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 and Marie Curie 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 at the Paris Brain Institute)

MEDIA

Media coverage (selected)

2026 Deryckere et al 2025 and Gumnit et al 2026:
Featured in "In Preprints" by J. S. Morel and F. Causeret, *Development* [link]

2024 Jaeger, Vijatovic, Deryckere et al 2024:
Covered in "New genetic tools usher amphibian neuroscience research into modern age" by Angie Voyles Askham, *The Transmitter* [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]

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]

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.

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]
2024 "New look at lampreys rewrites textbooks on origins of sympathetic nervous system", *The Transmitter* [link]
2025 "Intelligence evolved at least twice in vertebrate animals", *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
Public lecture "From genes to mind: the mystery of brain evolution", Bar Cafuchico, Frankfurt (June 2017), Frankfurt Night of Science (June 2018), Café Crumble, Frankfurt (Sept 2018)

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]