

Personal Data

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 The University of Vienna
 Djerassiplatz 1, 1030 Vienna, Austria,
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Career

Since 2018/10 University Professor of Neurobiology, University of Vienna.
 Co-affiliation with Research Institute of Molecular Pathology (IMP),
 Vienna, Austria.
 2010 – 2018 Independent group leader at the IMP, Vienna, Austria
 2004 – 2010 Postdoctoral fellow in the laboratory of Dr. Cori Bargmann, The
 University of California San Francisco & The Rockefeller University,
 New York, USA.
 2003 Ph.D.-degree granted with *summa cum laude* on 12/02/2003 by Ludwig-
 Maximillians-Universität Munich, Germany.
 1998 – 2003 Ph.D. studies in the laboratory of Dr. Rüdiger Klein at the EMBL-
 Heidelberg & Max-Planck-Institute of Neurobiology, Munich,
 Germany.
 1998 Diploma Degree in Biochemistry granted on 09/30/1998 by Freie
 Universität Berlin, Germany.
 1998 Diploma thesis studies in the laboratory of Dr. Steven J. Burden at the
 Skirball Institute of Biomolecular Medicine, New York, USA.
 1993 – 1998 University studies of Biochemistry at the Freie-Universität-Berlin,
 Germany.

Distinctions

Since 2019 eLife, Board of Reviewing Editors
 Since 2018 Elected EMBO member.
 2017 - 2022 HHMI International Research Scholar
 Since 2014 Member of the Simons Collaboration on the Global Brain
 2007 – 2009 The Robert Leet and Clara Guthrie Patterson Trust Fellow
 2004 – 2007 HFSP fellow
 2003 Ph.D. degree awarded *summa cum laude*

Teaching activities

Since 2018 University Professor – Neurobiology at the Faculty of Life Science, University of
 Vienna Austria.
 Teaching Subject: Neurobiology 8SWS including lectures, practical courses and
 advanced seminars

Organization of scientific meetings

2016 Co-organizer: EMBO Workshop on Metabolism and Eating Behavior, Cascais, Portugal
 2017 Co-organizer: WormNips Workshop, NIPS conference, Los Angeles, USA
 2022 Co-organizer: international *C. elegans* Neuroscience conference, CeNeuro2022, Vienna,
 Austria
 Since 2022: Co-organizer: CSHL Neuronal Circuits Meetings, Cold Spring Harbor, USA

Institutional Responsibilities

Since 2020 – Neuroscience cluster speaker, University of Vienna, Austria
2023 Organizer of a new Master's Curriculum in Neuroscience, University of Vienna, Austria in cooperation with Medical University of Vienna

Reviewing activities

2019 – eLife, Board of Reviewing Editors

2010 – Manuscript reviewing activity for: Nature, Nature Neuroscience, Neuron, Current Biology, Cell Reports, eLife, PLOS Biology, EMBO Journal, PNAS, Scientific Reports, PLOSone, BMC Biology, Network Neuroscience, Philosophical Transactions B, iScience, Lab on a Chip,

2010 – Funding body reviewing activities: European Research Council (ERC), Human Frontiers Science Program (HFSP), European Molecular Biology Organization (EMBO), Boehringer-Ingelheim Fonds, Swiss National Science Foundation, Medical Research Council (MRC), Biotechnology and Biological Sciences Research Council (BBSRC), Research Foundation Flanders (FWO).

Funding history

2024 – 2027	WWTF Life Sciences Call 2023. (#LS23-070) €799.998 (total funding), ~€347.000 (Zimmer lab)
2024 – 2027	Simons Collaboration on the Global Brain Culmination Award 2023. US\$436,400.00
2023 - 2028	European Research Council (ERC) Advanced Grant (<i>elegansBrainBodyEnvi</i> , #101054527). €3.5 Mio.
2020 – 2023	National Institute of Health (NIH) - Brain Initiative. Collaboration with Hernan Makse, City College of New York (#1R01EB028157-01A1). Sub-award to M. Zimmer: US\$ 241,381.
2017 - 2022	Wellcome Trust / HHMI / Gulbenkian Foundation / Gates Foundation. International Research Scholar Award (#208565/A/17/Z). US\$715.000.
2017 - 2023	The Simons Collaboration on the Global Brain (#543069). US\$1.080.000
2015 - 2020	Life Sciences Call 2014 – <i>Imaging</i> (#LS14-084). €582.000.
2014 - 2017	The Simons Collaboration on the Global Brain (#324958). US\$300.000.
2012 - 2017	European Research Council (ERC) Starting Independent Researcher Grant (<i>elegansNeurocircuits</i> , #281869). €1.5 Mio.
2007 - 2009	The Robert Leet and Clara Guthrie Patterson Trust Postdoctoral Fellowship Program in Brain Circuitry.
2004 – 2007	HFSP Postdoctoral fellowship
1998 – 2002	Ph.D. fellowship from the EMBL

Postdoc and PhD fellowships by lab members

2023 - 2025	Paul Pichler, VIP ² postdoc fellowship
2021 – 2024	Charles Fieseler, VIP ² postdoc fellowship
2021 – 2024	Simons Foundation SURF and SURFiN undergraduate Fellowships (Sofie Meyer, Tanja Edelbacher, Lisa Sippl, Hannah Brenner; total US\$45.000); 2x new fellowships in 2024 (approx. US\$45.000)
2021 - 2024	Charles Fieseler, VIP ² postdoc fellowship
2021 - 2023	Itamar Lev, HFSP postdoc fellowship
2020	Itamar Lev, EMBO postdoc fellowship ALTF 1037-2019
2020	Itamar Lev, VIP ² postdoc fellowship
2019 - 2021	Oriana Salazar, Austrian Academy of Science, DOC PhD fellowship
2018 - 2020	Mara Andrione, Marie Curie postdoc fellowship # 798332
2015	Saul Kato, EMBO advanced fellowship aALTF 773-2015
2014 - 2016	Saul Kato, EMBO postdoc fellowship LTF 345-2014
2012 - 2014	Tomas Eichler, Boehringer Ingelheim PhD fellowship

Publications (most important publications labelled #)

Avila B, Serafino M, Augusto P, Zimmer M*, Makse HA* (2024) **Fibration symmetries and cluster synchronization in the *Caenorhabditis elegans* connectome.** *PLoS ONE* 19(4): e0297669.

<https://doi.org/10.1371/journal.pone.0297669>. * Equal contribution

Moritz Grosse-Wentrup, Akshey Kumar, Anja Meunier, Manuel Zimmer (2023) **Neuro-Cognitive Multilevel Causal Modeling: A Framework that Bridges the Explanatory Gap between Neuronal Activity and Cognition.** *bioRxiv* 2023.10.27.564404; doi: <https://doi.org/10.1101/2023.10.27.564404>

Reumann D, Krauditsch C, Novatchkova M, Sozzi E, Nagumo Wong S, Zablocki M, Priouret M, Doleschall B, Ritzau-Reid KI, Piber M, Morassut I, Fieseler C, Fiorenzano A, Stevens MM, Zimmer M, Bardy M, Parmar M & Knoblich JA (2023). **In vitro modeling of the human dopaminergic system using spatially arranged ventral midbrain-striatum-cortex assembloids.** *Nat Methods* 20(12): 2034-2047. <https://doi.org/10.1038/s41592-023-02080-x>

Lev I, Zimmer M. (2023) **When neurons split the load.** *Elife*. May 4;12:e87861. doi: 10.7554/eLife.87861. PMID: 37140564; PMCID: PMC10159616; Preview article

Uzel K, Kato S, Zimmer M. (2022). **A set of hub neurons and non-local connectivity features support global brain dynamics in *C. elegans*.** *Current Biology*. 32(16): 3443-3459 e3448. doi: <https://doi.org/10.1016/j.cub.2022.06.039>. PMID: 35809568.

Riedl J, Zimmer M. (2022). **Tyraminergetic corollary discharge filters reafferent perception in a chemosensory neuron.** *Current Biology*. Jul 25;32(14):3048-3058.e6. <https://doi.org/10.1016/j.cub.2022.05.051>.

Lev I, Zimmer M (2022). **Predator-prey interactions: Strategic biting.** *Current Biology*. Apr 25;32(8):R367-R370. Preview article. doi: 10.1016/j.cub.2022.03.026.

Zimmer M. (2021). **Insect locomotion: Flies show you how to stay on course.** *Current Biology*. Oct 25;31(20):R1395-R1397. Preview article. doi: 10.1016/j.cub.2021.09.015.

Emmons SW, Yemini E, Zimmer M. (2021). **Methods for analyzing neuronal structure and activity in *Caenorhabditis elegans*.** *Genetics*. <http://doi.org/10.1093/genetics/iyab072>

Fieseler C, Zimmer, M, Kutz, JN. (2020). **Unsupervised learning of control signals and their encodings in *Caenorhabditis elegans* whole-brain recordings.** *Journal of the Royal Society Interface*, 17(173), 20200459. <http://doi.org/10.1098/rsif.2020.0459>

Kaplan HS, Zimmer M (2020). **Brain-wide representations of ongoing behavior: a universal principle?** *Current Opinion in Neurobiology*. 64, 60–69. <http://doi.org/10.1016/j.conb.2020.02.008>

Kaplan HS, Salazar Thula O, Khoss N, Zimmer M (2020). **Nested neuronal dynamics orchestrate a behavioral hierarchy across timescales.** *Neuron*. 105(3), 562–576.e9. <http://doi.org/10.1016/j.neuron.2019.10.037>

Uzel K., Zimmer M (2019). **Imaging the Emergence of Behavior.** *Cell* 179(2), 285–286. Preview article. <http://doi.org/10.1016/j.cell.2019.09.006>

Lechner M, Hasani R, Zimmer M, Henzinger TA and Grosu R (2019). **Designing Worm-inspired Neural Networks for Interpretable Robotic Control.** *International Conference on Robotics and Automation (ICRA)*. 2019, pp. 87-94, doi: 10.1109/ICRA.2019.8793840.

Kaplan HS, Nichols ALA, Zimmer M (2018). **Sensorimotor integration in *C. elegans*: a reappraisal towards dynamic and distributed computations.** *Philos Trans R Soc Lond B Biol Sci*. Sep 10;373(1758). pii: 20170371. <https://doi.org/10.1098/rstb.2017.0371>

Kaplan HS, Zimmer M (2018). **Sensorimotor Integration for Decision Making: How the Worm Steers.** *Neuron*. 2018 Jan 17;97(2):258-260. Preview article.

<https://doi.org/10.1016/j.neuron.2017.12.042>

Rojo Romanos T⁺, Ng L, Zimmer M⁺, Pocock R⁺ (2018). **Behavioral Assays to Study Oxygen and Carbon Dioxide Sensing in *Caenorhabditis elegans***. *Bio-Protocol*, 8(1). <http://doi.org/10.21769/BioProtoc.2679> + Corresponding authors

Skora S, Mende F, Zimmer M (2018). **Energy scarcity promotes a brain-wide sleep state modulated by insulin signaling in *C. elegans***. *Cell Reports* Jan 23;22(4):953-966. <https://doi.org/10.1016/j.celrep.2017.12.091>

Rouse T, Aubry G, Cho Y, Zimmer M, Lu H (2018). **A programmable platform for sub-second multichemical dynamic stimulation and neuronal functional imaging in *C. elegans***. *Lab Chip*, Jan 9. (Epub ahead of print). <https://doi.org/10.1039/c7lc01116d>

Nichols ALA, Eichler T, Latham R, Zimmer M (2017). **A global brain state underlies *C. elegans* sleep behavior**. *Science* 356, eaam6851. <https://doi.org/10.1126/science.aam6851>

Jang H, Levy S, Flavell SW, Mende F, Latham R, Zimmer M and Bargmann CI (2017). **Dissection of neuronal gap junction circuits that regulate social behavior in *Caenorhabditis elegans***. *P.N.A.S.*, 201621274–10. <https://doi.org/10.1073/pnas.1621274114>

Drexel T, Mahofsky K, Latham R, Zimmer M, Cochella L (2016). **Neuron type-specific miRNA represses two broadly expressed genes to modulate an avoidance behavior in *C. elegans***. *Genes & Development*, 30(18), 2042–2047. <https://doi.org/10.1101/gad.287904.116>

Hums I, Riedl J, Mende F, Kato S, Kaplan HS, Latham R, Sonntag M, Traunmüller T, and Zimmer M (2016). **Regulation of two motor patterns enables the gradual adjustment of locomotion strategy in *Caenorhabditis elegans***. *eLife* 2016;5:e14116. <https://doi.org/10.7554/eLife.14116>

Witham E, Comunian C, Ratanpal H, Skora S, Zimmer M, & Srinivasan S (2016). ***C. elegans* Body Cavity Neurons Are Homeostatic Sensors that Integrate Fluctuations in Oxygen Availability and Internal Nutrient Reserves**. *Cell Reports*. 14(7), 1641–1654. <https://doi.org/10.1016/j.celrep.2016.01.052>

Moreno E, McGaughan A, Rödelberger C, Zimmer M, & Sommer RJ (2016). **Oxygen-induced social behaviours in *Pristionchus pacificus* have a distinct evolutionary history and genetic regulation from *Caenorhabditis elegans***. *Proceedings of the Royal Society B: Biological Sciences*, 283(1825), 20152263–9. <https://doi.org/10.1098/rspb.2015.2263>

Kato S*, Kaplan HS*, Schrödel T*, Skora S, Lindsay TH, Yemini E, Lockery S, Zimmer M (2015). **Global Brain Dynamics Embed the Motor Command Sequence of *Caenorhabditis elegans***. *Cell*, 163(3), 656–669. <https://doi.org/10.1016/j.cell.2015.09.034>* Authors with equal contribution

Yapici N, Zimmer M₂ & Domingos AI (2014). **Cellular and molecular basis of decision-making**. *EMBO Reports*, 15(10), 1023–1035. *Review*. <https://doi.org/10.15252/embr.201438993>

Prevedel R, Yoon, YG, Hoffmann M, Pak N, Wetzstein G, Kato S, Schrödel T, Raskar R, Zimmer M, Boyden ES, Vaziri A (2014). **Simultaneous whole-animal 3D imaging of neuronal activity using light-field microscopy**. *Nature Methods* 11(7), 727–730. <https://doi.org/10.1038/nmeth.2964>

Schrödel T*, Prevedel R*, Aumayr K, Zimmer M⁺ & Vaziri A⁺ (2013). **Brain-wide 3D imaging of neuronal activity in *Caenorhabditis elegans* with sculpted light**. *Nature Methods* Oct;10(10):1013–20. <https://doi.org/10.1038/nmeth.2637> + Corresponding authors, * authors with equal contribution

Skora S, and Zimmer M (2013). **Life(span) in balance: oxygen fuels a sophisticated neural network for lifespan homeostasis in *C. elegans***. *Embo J* 32, 1499–1501. *Preview*. <https://doi.org/10.1038/emboj.2013.101>

Gramstrup Petersen J, Rojo Romanos T, Juozaityte V, Redo Riveiro A, Hums I, Traunmüller L, Zimmer M, and Pocock, R (2013). **EGL-13/SoxD Specifies Distinct O₂ and CO₂ Sensory Neuron**

Fates in *Caenorhabditis elegans*. PLoS Genet May;9(5):e1003511.

<https://doi.org/10.1371/journal.pgen.1003511>

Zimmer M, Gray JM, Pokala N, Chang AJ, Karow DS, Marletta MA, Hudson ML, Morton DB, Chronis N & Bargmann CI (2009). **Neurons Detect Increases and Decreases in Oxygen Levels Using Distinct Guanylate Cyclases.** *Neuron* Mar 26; 61(6): 865-879.

<https://doi.org/10.1016/j.neuron.2009.02.013>

McGrath PT, Rockman MV, Zimmer M, Macosko EZ, Jang H, Kruglyak L, and Bargmann CI (2009). **Quantitative mapping of a digenic behavioral trait implicates globin variation in *C. elegans* sensory behaviors.** *Neuron* Mar 12; 61(5): 692-699. <https://doi.org/10.1016/j.neuron.2009.02.012>

Essmann CL, Martinez E, Geiger JC, Zimmer M, Traut MH, Stein V, Klein R, Acker-Palmer, A (2008). **Serine phosphorylation of ephrinB2 regulates trafficking of synaptic AMPA receptors.** *Nature Neuroscience* Sep; 11(9): 1035-43. <https://doi.org/10.1038/nn.2171>

Chronis N, Zimmer M, Bargmann CI (2007). **Microfluidics for *in vivo* imaging of neuronal and behavioral activity in *Caenorhabditis elegans*.** *Nature Methods* Sep; 4(9): 727-31.

<https://doi.org/10.1038/nmeth1075>

Zimmer M, Palmer A, Köhler J, Klein R (2003). **EphB-ephrinB bi-directional endocytosis terminates adhesion allowing contact mediated repulsion.** *Nature Cell Biology* Oct; 5(10): 869-878. <https://doi.org/10.1038/ncb1045>

Palmer A*, Zimmer M*, Erdmann KS, Eulenburg V, Porthin A, Heumann R, Deutsch U, Klein R (2002). **EphrinB phosphorylation and reverse signaling: Regulation by Src kinases and PTP-BL phosphatase.** *Molecular Cell* Apr; 9(4): 725-37. [https://doi.org/10.1016/S1097-2765\(02\)00488-4](https://doi.org/10.1016/S1097-2765(02)00488-4)

* Authors with equal contribution

Kullander K, Croll SD, Zimmer M, Pan L, McClain J, Hughes V, Zabski S, DeChiara TM, Klein R, Yancopoulos GD, Gale NW (2001). **Ephrin-B3 is the midline barrier that prevents corticospinal tract axons from recrossing, allowing for unilateral motor control.** *Genes & Development.* Apr 1; 15(7): 877-88. <https://doi.org/10.1101/gad.868901>

Watty A, Neubauer G, Dreger M, Zimmer M, Wilm M, Burden SJ (2000). **The *in vitro* and *in vivo* phosphotyrosine map of activated MuSK.** *Proc. Natl. Acad. Sci. U S A.* Apr 25; 97(9): 4585-90. <https://doi.org/10.1073/pnas.080061997>