



From High-Resolution Microscopy to Human Studies: Understanding How We Learn

Dear Reader,

We are approaching the second half of the year, and 2023 has already shaped to become a very successful year for the URPP AdaBD. We have published several **articles**, further developed our **platforms** and started some **human studies**. Moreover, we co-organized the **Brainfair 23** and are participating in the **Scientifica 2023** with an exhibition booth.

In this newsletter, we welcome you to visit us at the [Scientifica 2023](#) on **September 2-3, 2023**. Further, we update you on our research. Please note: we are looking for participants in human studies!

Upcoming Event: Exhibition Booth at the Scientifica 23, September 2-3

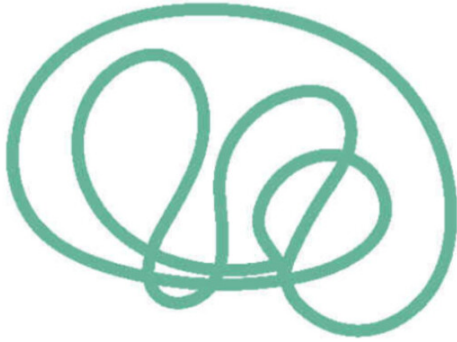
From Child to Grown-Up: Understand and Foster Learning



We're happy to once again join Switzerland's largest science festival where you can experience science in direct exchange with researchers. **Visit our exhibition booth (A26) at the Scientifica Fair** at the Irchel Campus where we present our work and show you how we try to understand and foster learning.

At our booth, you and your children can observe neural circuits of *fish*, *fruit fly larvae* and *chicken embryos* under the microscope. Or you can put on virtual reality goggles to explore a *3D reconstruction of the neural pathways* in the human brain. Kids can make brains out of *modeling clay* and learn how we observe the human brain as it creates a word out of an alphabet soup.

[More information.](#)



The topic of learning was the focus of this year's BrainFair and the program was based to a large part on our research projects.

From March 13th to March 18th, we participated in the BrainFair 23, where we organized panel discussions about the influence of genes and environment on brain development, about support for learning disabilities, and about learning in humans and animals. Furthermore, we had exhibition booths on Saturday.

The **recordings of the panel discussions** can be found on the [BrainFair website](#) (in German).

Articles on the university's communication portal "UZH News"

[Den Ursachen von Lernstörungen auf der Spur, April 4, 2023](#)

[Die Qual der Zahl, March 7, 2023](#)

Human Studies: We Are Looking for Participants!

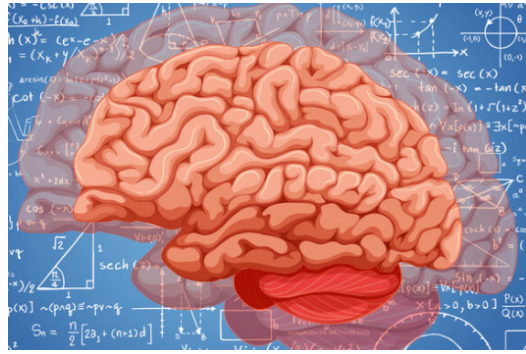
We already started several human studies. For two of them, we are currently looking for participants!



Child Brain Circuits

We are investigating how the child brain integrates information from different senses and whether there are differences in children with and without language impairment. Multisensory integration is an essential component of many processes, such as learning and language development. Thus, a better understanding of these processes could contribute to the development of better detection and treatment strategies for language disorders in children. **We are currently looking for children (5-12 years, with or without language impairment) and parents who would be interested in participating in an MRI study.**

[More information and registration](#)

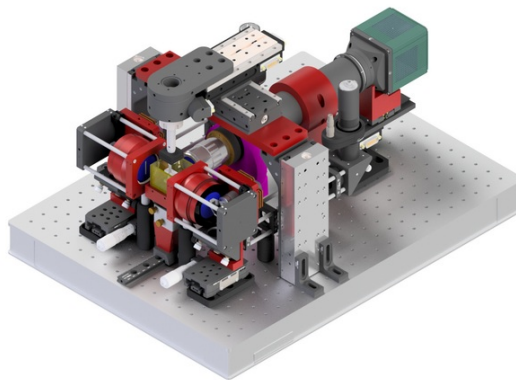
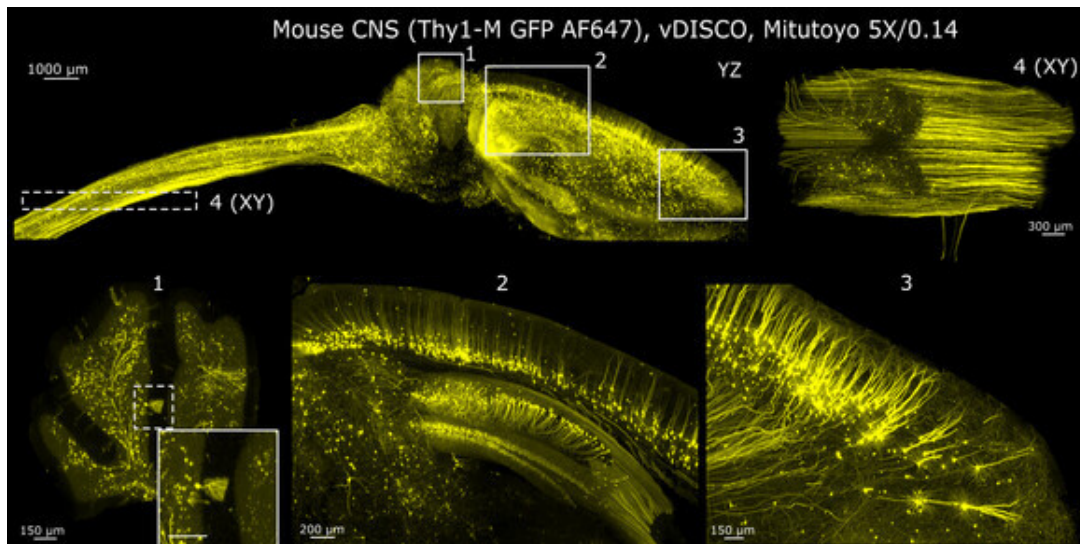


NumRisk

Numerical and arithmetic abilities are indispensable for everyday normal functioning in modern society. Still, the number and math specific learning disorder dyscalculia is poorly characterised outside the classroom. In this study, we want to investigate how basic numerical cognition, which is presumably altered in dyscalculia, affects financial decision making. For this, **we are looking for participants between 15 and 23 years of age without (control group) and with dyscalculia.** The visit at our lab in the University Hospital Zurich lasts about 3.5 hours and includes an MRI scan.

For more information or registration, [please contact us.](#)

The Benchtop Microscope: a New Milestone in the mesoSPIM Project



Compact, easier to build, portable, affordable, with improved optics, higher resolution, and larger field of view: This is the **Benchtop mesoSPIM**, our new milestone in light-sheet imaging of 3D samples! Check out our [preprint for more](#).

Progress Report 2022

The Progress report 2022 of the URPP AdaBD can be [downloaded](#) on our website.

Publications 2023

Barretto-García M, de Hollander G, Grueschow M, Polanía R, Woodford M, Ruff CC (2023) [Individual risk attitudes arise from noise in neurocognitive magnitude representations](#). Nature Human Behavior

Di Pietro S, Williger D, Frei N, Lutz C, Coraj S, Schneider C, Stämpfli P, Brem S (2023) [Disentangling influences of dyslexia, development, and reading experience on effective brain connectivity in children](#). NeuroImage 268, 119869

Di Pietro SV, Karipidis II, Pleisch G, Brem S (2023) [Neurodevelopmental trajectories of letter and speech sound processing from preschool to the end of elementary school](#). Developmental Cognitive Neuroscience

Egger M, Luo W, Cruz-Ochoa N, Lukacsovich D, Varga C, Que L, Maloveczky G, Winterer J, Kaur R, Lukacsovich T, Földy C (2023) [Commissural dentate granule cell projections and their rapid formation in the adult brain](#). PNAS Nexus, 2(4):pgad088

Frey T, Ivanovski I, Bahr A, Zweier M, Laube J, Luchsinger I, Steindl K, Rauch A (2023) [A very mild phenotype in six individuals of a three-generation family with the novel HRAS variant c.176C > G p.\(Ala59Gly\): Emergence of a new HRAS-related RASopathy distinct from Costello syndrome](#). American Journal of Medical Genetics

Voigt F, Reuss A, Naert T, Hildebrand S, Schaettin M, Hotz A, Whitehead L, Bahl A, Neuhaus S, Roebroek A, Stoeckli E, Lienkamp S, Aguzzi A, Helmchen F (2023) [Reflective multi-immersion microscope objectives inspired by the Schmidt telescope](#). Nature Biotechnology

Preprint

Vladimirov N, Voigt FF, Naert T, Araujo GR, Cai R, Reuss AM, Zhao S, Schmid p, Hildebrand S, Schaettin M, Groos D, Mateos JM, Bethge Ph, Yamamoto T, Aerne V, Roebroek A, Ertürk A, Aguzzi A, Ziegler U, Stoeckli E, Baudis L, Lienkamp SS, Helmchen F (2023) [The Benchtop mesoSPIM: a next-generation open-source light-sheet microscope for large cleared samples](#). bioRxiv

Our website will be updated regularly with our newest [publications](#).

URPP AdaBD Director Fritjof Helmchen Awarded SNSF Advanced Grant

Congratulations to our director **Fritjof Helmchen**, who receives the Swiss National Science Foundation (SNSF) Advanced Grant 2022 for his project on memory formation in the hippocampus.

Article on the university's communication portal "UZH News"

[Two Million for Memory Research, August 29, 2023](#)

Awards and Appointments

AdaBD member **Sebastian Jessberger** has won the Cloëtta price 2023 for his research.

AdaBD member **Theofanis Karayannis** has been appointed as Associate Professor for Neuroscience, starting 1st of June, 2023.

PhD Student **Daniel Gonzalez-Bohorquez** won the [UZH Foundation Brain Diseases Award](#) for his work within the AdaBD project "Using hippocampal organoids to study human brain development".

Congratulations to Our Students and Postdocs for Fellowships

PostDoc **Gökhan Aydogan** received a [UZH Postdoc Grant](#) for his work within the AdaBD project "The effect of early childhood and in-utero trauma on brain development, educational outcomes, and professional attainment: Large-scale evidence from the UK Biobank".

PhD Student **Hanna Yeliseyeva** obtained a prolongation of her [FCS fellowship](#) for her work within the AdaBD project EXPAND.

PhD Student **Johanna Nieweler** received a [UZH Candoc Grant](#) for her work within the AdaBD project "Dendritic integration in neocortical pyramidal neurons as basis for multisensory learning".

We Are on LinkedIn!

From now on you can find us on the online platform [LinkedIn](#). Follow us to get the latest news about our research, projects and events.



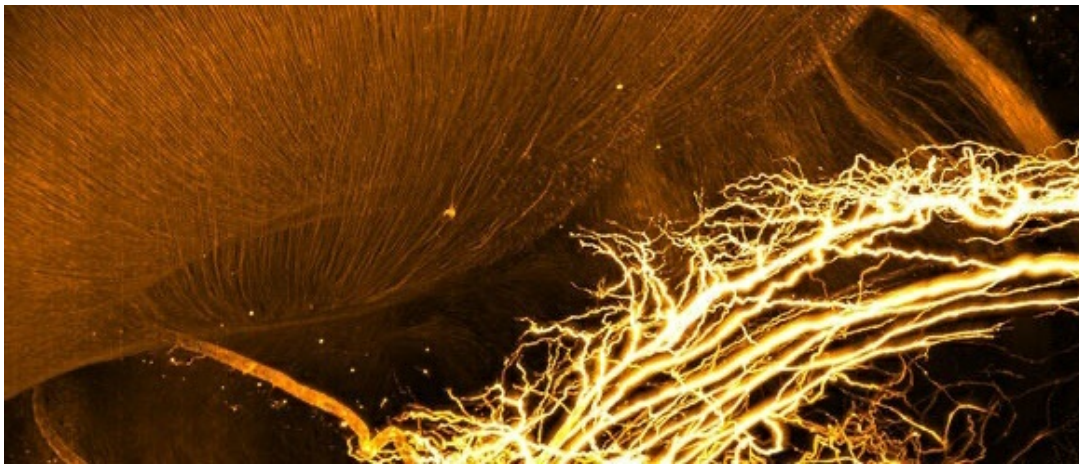
From the Editor's Desk

Welcome

On July 5th our coordinator **Laura Zanetti** gave birth to her son Ennio. Welcome, Ennio, and congratulations to the parents!

A very warm welcome to **Adriana Rüeegger** as coordinator (replacing Laura during her maternity leave).





The mesoSPIM gallery - mesospim.org: 7-day old chicken embryo cleared with BABB (Neurofilament staining)

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