Robert Bing Prize 2024 goes to Alexander and Mackenzie Mathis, EPFL, and to Susanne Wegener, USZ

The Robert Bing Prize 2024 is awarded to three remarkable neuroscientists: Alexander and Mackenzie W. Mathis, assistant professors at EPFL, are being distinguished together for their pioneering work bridging machine learning and neurobiological behavioral research. Susanne Wegener, associate professor at the University of Zurich and senior physician at University Hospital Zurich, is honored for her translational research on the pathophysiology and treatment of stroke. Both prizes are worth 30'000 francs.

The Prize, bestowed every two years by the Swiss Academy of Medical Sciences (SAMS), originates from a generous bequest of Basel neurologist Robert Bing (1878–1956). In accordance with the donor's will, the Prize is awarded to researchers who have done outstanding work to improve the recognition, treatment and cure of neurological diseases. The award ceremony will take place on 14 November 2024 in Bern. Further information and an overview of past Bing Prize laureates are available on the SAMS website: sams.ch/bing-prize.

Prof. Susanne Wegener

Susanne Wegener is associate professor in Neurology at the University of Zurich and senior leading physician in the Department of Neurology of the University Hospital Zurich. Her remarkable translational work spans innovative basic neuroscience research in experimental stroke models to clinical decision making in stroke care. Recognized as an international expert in stroke research, she is the recipient of several awards, including the SAMS Stern-Gattiker Prize and the Georg Friedrich Götz Prize.

Using multidisciplinary approaches, Prof. Wegener's group investigates the impact of collaterals on reperfusion in stroke, the importance of leukocytes in vascular obstruction, the prediction of therapeutic success using imaging and machine learning, the interplay of brain microperfusion and plasticity, and women's cardiovascular health. The identification of mechanisms explaining the variability in outcome between individual patients treated with recanalization therapies after an arterial occlusion, a major medical problem, is one of the main discoveries of her research group.

Susanne Wegener studied medicine and obtained her doctorate in molecular neurobiology at the University of Hamburg in 2001. During her residency in neurology at the Charité Berlin, she discovered her passion for combining research and clinical practice to develop better treatments for neurological patients. She interrupted her clinical training to deepen her research knowledge at the Max Planck Institute in Cologne, studying ischemia tolerance mechanisms in cerebral stroke. She then joined the University of California San Diego to gain expertise in neuroimaging and physiological modeling. Susanne Wegener completed her clinical training in neurology at the University Hospital Zurich, where she established her own research group in 2017 with an SNSF assistant professorship, alongside her role as attending physician.

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Prof. Alexander Mathis

Alexander Mathis is an assistant professor at the Brain Mind Institute at EPFL. He is working at the intersection of computational neuro-science and machine learning, focusing on trying to understand the statistics of behavior and how the brain creates behavior. He studied pure Mathematics at the Ludwig-Maximilians-Universität München, where he also obtained his PhD in computational neuroscience in 2012. During his PhD he developed a theory on how space is represented in the brain. He then was a postdoctoral fellow at Harvard University and the University of Tübingen working on a broad range of topics from the sense of smell to computer vision.

Since 2020 he is an assistant professor at EPFL, where he currently works on theories of proprioception and motor control. His team strives to create accessible, open-source algorithms for behavioral analysis, including DeepLabCut, a tool co-developed with Mackenzie W. Mathis that has made a significant impact in neuroscience and beyond. Together with his students, he won renowned competitions based on brain-inspired reinforcement learning algorithms for skill learning (MyoChallenge at NeurIPS 2022 and 2023). He received several grants and fellowships, among which the Marie Skłodowska-Curie Postdoctoral Fellowship and a scholarship from the Studienstiftung des deutschen Volkes.

Prof. Mackenzie Mathis

Mackenzie Weygandt Mathis is an assistant professor and the Bertarelli Foundation Chair of Integrative Neuroscience at EPFL. Her work spans developing novel in vitro assays with induced pluripotent stem cell-derived motor neurons for high-throughput drug screening for Amyotrophic Lateral Sclerosis (ALS), to understanding sensorimotor learning using systems neuroscience and deep learning approaches.

She studied Science at the University of Oregon and obtained her PhD from Harvard University in 2017. Following her PhD, she became a Rowland Fellow, establishing her own laboratory at Harvard University where she developed modern approaches to studying adaptive motor control in mice. In 2020, she joined EPFL, where she continues to work with her research group on innovative machine learning, computer vision, and experimental approaches to understand how neural mechanisms support adaptive intelligence. Her multidisciplinary research has been recognized by numerous grants and awards, including the 2022 FENS Young Investigator Award and the 2024 Latsis Prize.

In collaboration with Alexander Mathis, she co-developed the pioneering deep learning method DeepLabCut, which enables automatic tracking and quantification of animal behavior, including in humans. These tools, which she combines with empirical studies on sensorimotor circuits in rodents in her laboratory, have been widely used in various scientific contexts. Notably, they are also currently being tested in clinical trials to aid in recovery from motor disorders in patients.

Alexander and Mackenzie Mathis jointly received the 2023 Frontiers of Science Award for their original paper on DeepLabCut and were awarded the 2023 Eric Kandel Young Neuroscientists Prize.

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Portraits in print quality can be downloaded from the SAMS website: sams.ch/media.