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Emilie Macé takes up new professorship for Dynamics of Excitable Cell Networks

Neuroscientist and expert in functional ultrasound bioimaging strengthens research profile of the Cluster of Excellence MBExC.



(mbexc/umg) Prof. Dr. Emilie Macé has taken up the university professorship for Dynamics of Excitable Cell Networks at the University Medical Center Göttingen (UMG) on 1st April 2023. The professorship was newly established as part of the Cluster of Excellence "Multiscale Bioimaging: From Molecular Machines to Excitable Cell Networks (MBExC)" and is assigned to the Department of Ophthalmology (Director: Prof. Dr. Hans Hoerauf) at the UMG. The neuroscientist Emilie Macé brings a particular expertise in functional ultrasound imaging to Göttingen. This novel technology that she has pioneered allows to investigate how the brain controls behavior at the level of brain-wide networks. She, thus, strengthens the cross-scale multidisciplinary research approach of the Göttingen Cluster of Excellence (MBExC). Macé and her team are also closely integrated into the Center for Biostructural Imaging of Neurodegeneration (BIN).



MBExC Professor Dr. Emilie Macé from the Department of Ophthalmology, UMG. Photo: private.

"By investigating neuronal networks at the scale of the entire brain, Prof. Macé and her team will significantly strengthen the MBExC and the Göttingen Campus", says Tobias Moser, spokesperson of the MBExC and Director of the Institute for Auditory Neuroscience at the University Medical Center Göttingen (UMG).

In her research, Prof. Macé addresses how brain-wide networks interact to produce a particular behavior. The functional ultrasound imaging technique allows the brain to be viewed as a whole and, for example, to observe the transition from visual perception into behavior (visuomotor function). She combines this technique with targeted genetic circuit manipulations and electrophysiological measurements. One goal is to better understand how cognitive processes, such as behavioral switching, arise in the brain across multiple scales and uncover dysfunctions of these networks in psychiatric disorders. Macé also studies innovative optogenetic strategies against blindness to restore visual perception and visuomotor function.

Prof. Dr. Emilie Macé (born 1985, France) completed her engineering studies with a focus on physics at the Ecole Supérieure de Physique et de Chimie Industrielles (ESPCI Paris Tech) in Paris. After completing a Master of Research in Bioimaging Sciences at the Imperial College London, Macé earned a Ph.D. in physics at the Langevin Institute at the Université Paris Diderot about the development of functional ultrasound imaging technology. As a postdoctoral researcher, she then turned to

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neuroscience, initially researching vision restoration through optogenetics at the *Institut de la Vision* in Paris. At the Friedrich Miescher Institute for Biomedical Research in Basel, Switzerland, she then used the functional ultrasound imaging technique to elucidate the neuronal networks that mediate a visual reflex (optokinetic reflex) and are relevant to visuomotor integration. She identified new brain regions that are significant for the integration of visual information with eye movements. In 2019, she joined the Max Planck Institute for Biological Intelligence (formerly the Max Planck Institute for Neurobiology) in Martinsried as an independent Max Planck Group Leader, where she continued to use functional ultrasound imaging to study the neural basis of behavior across scales.

The Göttingen Cluster of Excellence Multiscale Bioimaging: From Molecular Machines to Networks of Excitable Cells (MBExC) is funded since January 2019 in the framework of the Excellence Strategy of the German Federal and State Governments. Applying a unique and multiscale approach, MBExC investigates the disease-relevant functional units of electrically active cells of heart and brain, from the molecular to the organ level. The MBExC unites numerous partners from the university and extra-university institutions in Göttingen. The overall goal: to understand the relationship between heart and brain diseases, to link basic and clinical research, and thus to develop new therapeutic and diagnostic approaches with social implications.

FURTHER INFORMATIONEN

about the MBExC: <https://mbexc.de/>

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