SFB 1315
Mechanisms and Disturbances in Memory Consolidation:
From synapses to systems

SFB1315 News

JAN, 2021

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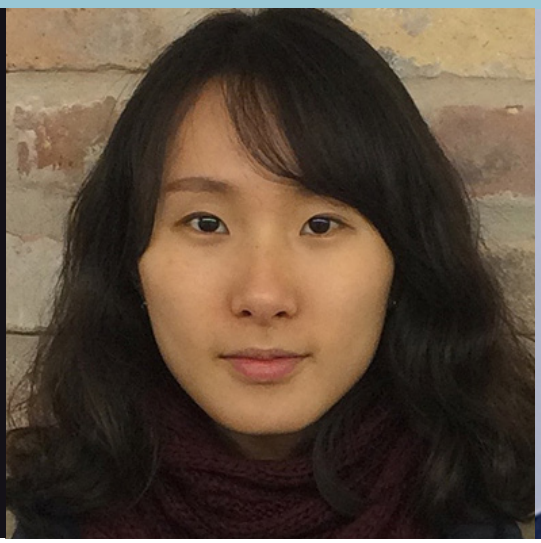
SFB 1315 EQUAL OPPORTUNITY AND DIVERSITY

BRENDA MILNER AWARD-WINNERS 2021

JIYUN SHIN AND DOROTHEA HÄMMERER



Images, courtesy Jiyun Shin (l) HU Berlin and Dorothea Hämmerer (r) OvGU Magdeburg)

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BRENDA MILNER AWARD 2021

Two outstanding scientists are awarded the Brenda Milner Award in 2021. Read all about both awardees: https://www.sfb1315.de/equity-diversity-inclusion/)

Jiyun Shin is awarded the Brenda Milner Award 2021 for her contribution to the understanding of memory formation in the neocortex. Dr. Brenda Milner's seminal study with patient H.M. established the crucial role of the hippocampus in long-term declarative memory formation. Her study also suggested that the medial temporal lobe including the hippocampus has a time-limited role in this process, and that long-term memory resides in the neocortex. Although we know that hippocampal-neocortical interactions are essential for neocortical memory formation, our understanding of how and where exactly this process occurs in the neocortex has been limited even 60 years after Dr. Milner's first discovery. Jiyun Shin joined the A04 project as part of her PhD under the supervision of Dr. Guy Doron. After Dr. Doron's departure, Jiyun Shin, took over the project, which elucidated that neocortical layer 1 is a central anatomical location for memory formation. This work involved several collaborations within (AG Brecht, project A03) as well as outside of SFB1315. Here, they showed that medial temporal inputs arising from the perirhinal cortex, to layer I of the rodent primary somatosensory cortex are crucial for hippocampal-dependent associative learning. These inputs modulated the dendritic Ca2+ activity and burst firing of layer 5 pyramidal neurons, which were previously shown to play a crucial role in cognitive functions such as sensory perception (by project A04 alumnus Dr. Naoya Takahashi). By identifying an anatomical target of neocortical memory formation and the cellular mechanisms which underlie this process, this study made a major contribution to our understanding of memory trace transformation and systems synaptic consolidation, which is among the main goals of our SFB. The significance of the study has recently recognized by acceptance for publication in the journal Science (Doron, Shin et al. 2020).

Dr. Dorothea Hämmerer is awarded the Brenda Milner Award 2021 for establishing herself as a leading figure in the field of cognitive neuroscience of neuromodulation, with a special emphasis on understanding the relevance of dopaminergic and noradrenergic changes for brain ageing and dementia. In her research she focuses on optimizing structural and functional magnetic resonance imaging (MRI) sequences of these neuromodulatory nuclei as well as developing cognitive paradigms tailored to capture neuromodulatory cognitive changes in different age groups. Moreover, she has been instrumental in establishing a cutting-edge concurrent fMRI-dynamic PET (positron emission tomography) imaging paradigm, which allows us to measure endogenous dopamine release during cognitive tasks in older adults. Her contributions to the field have resulted in several high-ranking publications as well as the start of an international meeting series on Locus Coeruleus imaging in Magdeburg. These achievements are nicely exemplified in her first SFB-funded publication in Nature Communications (Liu et al. 2020), which shows that we can use in vivo neuroimaging to identify a cognitively relevant decline in the noradrenergic locus coeruleus in ageing. By providing cognitive as well as methodological innovations, Dorothea's research is of relevance for a wide range of cognitive and clinical research aiming to understand consequences of neuromodulatory changes in the brain.

Please join us in congratulating Jiyun Shin and Dorothea Hämmerer!

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