



SFB 1315

Mechanisms and Disturbances in Memory Consolidation:
From synapses to systems

Tuesday

DEC 16, 2025
4:00 pm

BCCN Lecture Hall
Philippstraße 13/Haus 6
10115 Berlin
Meeting-ID: 775 491 0236
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SFB 1315 LECTURE SERIES 2025

THE REINSTATEMENT OF A FORGOTTEN INFANTILE MEMORY

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The Center for Molecular Life Sciences
University of Basel
Switzerland



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Infantile memories present a striking paradox: early-life experiences are typically forgotten, reflecting the phenomenon of infantile amnesia, yet traumatic events from infancy can profoundly shape adult cognition and behavior. How do memories that are seemingly inaccessible persistently influence cognitive processes and behaviors throughout life? Rodent studies have demonstrated that forgotten infantile memories remain encoded as latent “infantile memory engrams” (iEngrams) within neuronal circuits, capable of reinstatement under specific experimental conditions.

Leveraging advanced engram-labeling technologies, dual-color in vivo calcium imaging, and opto- and chemogenetic manipulations, we longitudinally tracked individual hippocampal memory engrams from infancy to adulthood. Our findings reveal that infantile memories, though physiologically irretrievable in adults, remain stored within hippocampal circuits. Crucially, we demonstrate that reinstating these memories requires a carefully orchestrated network process: an initial contextual reminder primes the hippocampal network to increase activity of the

iEngram during a subsequent aversive reminder, which tags engram neurons for offline reactivation. This reactivation facilitates the integration of previously latent infantile memories with novel neuronal ensembles, reinstating behavior consistent with the original memory.

Beyond advancing our understanding of the neuronal mechanisms underlying physiological memory encoding, retrieval, and reinstatement across development, we believe our findings could pave the way for novel interventions aimed at promoting beneficial memory retrieval or preventing the maladaptive reinstatement of traumatic infantile memories, potentially offering innovative strategies in psychiatry and clinical psychology to mitigate long-term impacts of early-life trauma.

This invited talk is hosted by
SFB1315 project Ao5 (Annapoorani
Uhayachandran)

Certificate of attendance

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