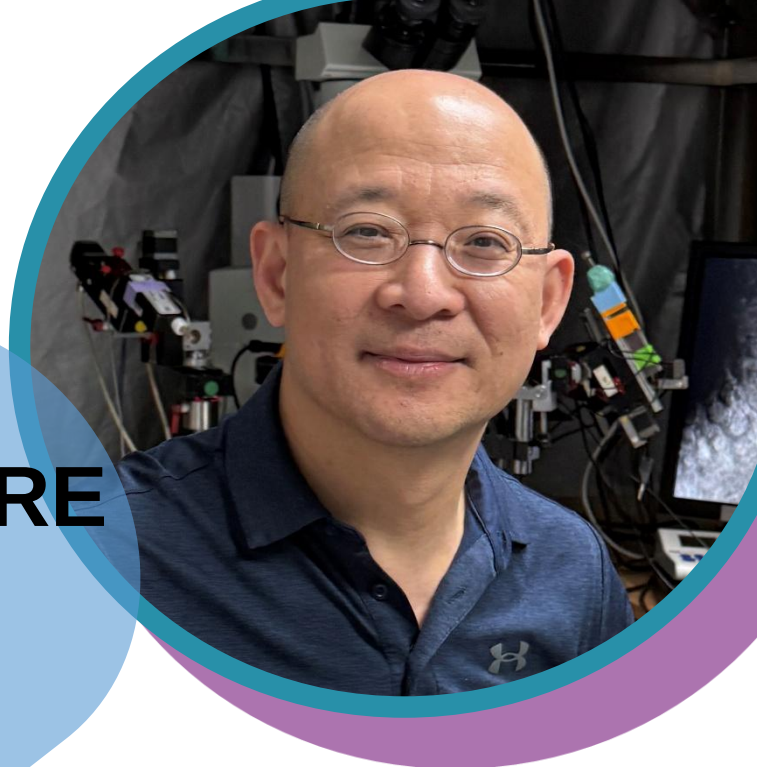


SEMINAIRE 2026

03
Décembre
10h00

Biserte
Meeting Room



Invité par l'équipe
« Lille Neurodegeneration »

Pr. Cheng-Chang Lien

Institute of Neuroscience, National Yang
Ming Chiao Tung University, Taiwan

“Distinct Dorsal and Ventral Mossy Cell Dynamics Coordinate Associative Fear Learning”

The hippocampus exhibits pronounced functional specialization along its dorsal–ventral axis, yet how these domains are dynamically coordinated during emotional learning remains unresolved. Here, we identify dentate gyrus mossy cells (MCs) as a longitudinal integrative circuit linking dorsal and ventral hippocampal processing during associative fear learning. Using in vivo calcium imaging in mice undergoing auditory fear conditioning, we find that dorsal MCs preferentially encode conditioned stimulus (CS) information, whereas ventral MCs are selectively engaged by the unconditioned stimulus (US). During memory recall, dorsal MCs maintain CS-related activity, while ventral MCs display temporally coordinated activation in the absence of the US, suggesting internally driven ensemble dynamics. Causal perturbation with chemogenetic silencing or optogenetic inhibition of either population disrupts freezing behavior, indicating that both dorsal and ventral MC activity is required for fear expression. Together, these findings reveal a division of labor in which dorsal MCs represent predictive cues and ventral MCs convey aversive value, with their coordinated activity enabling the formation and expression of associative fear memory.