

DANDRITE Topical Seminar

Friday 12 October 2018
15:00-16:00

The Library, building 1170, room 440
Ole Worms Allé, 8000 Aarhus



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Distinct clusters of the amygdala intercalated cells bi-directionally control fear state

Since excessive fear memory expression leads to loss of opportunities in many aspects, properly inhibiting once acquired fear memory is as important for our life as initial formation of fear memory. Intercalated cells (ITCs) of the amygdala, clusters of unique small-sized inhibitory neurons encapsulating the lateral and basal amygdala, are anatomically well situated to provide inhibition on amygdala circuits underlying fear expression, and thus, have been highly implicated in fear extinction. However, largely due to their small size and lack of a targeting method, it has been challenging to functionally dissect roles of individual ITC clusters. Here, by exploiting a multidisciplinary approach including *in vivo* calcium imaging from freely moving mice engaging classical auditory fear conditioning paradigm, chemogenetic activity manipulations, slice physiology, virus-based circuit tracings, and transcriptomics, we show that distinct clusters of ITCs bi-directionally control fear state. Our results also suggest that they differently regulate neural computations in other amygdala nuclei that are known to be essential for fear expression. Our findings provide a new view of individual clusters of ITC as key components for fear state regulation, and as emerging clinical targets for anxiety disorders.

Host: Group Leader Keisuke Yonehara, DANDRITE, Dept. Biomedicine, Aarhus University