

DANDRITE Topical Seminar
by visitor **Juliane Martin**

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From 13:15 – 14:00

Aud. 6, 3rd floor, building 1170, room 347
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Interleukin-1 Regulates Adult Hippocampal Neurogenesis and Spatial Learning Independently

Interleukin-1 (IL-1) has been suggested to exert a dual role in hippocampal function. Whereas physiological levels seem to be required for proper spatial memory formation, levels below or above that range have been shown to impair spatial learning. Furthermore, high levels of IL-1 are known to be detrimental to adult hippocampal neurogenesis, which has been implicated to support hippocampal function with respect to reversal spatial learning. However, whether IL-1 has also a physiological role in adult hippocampal neurogenesis and, thereby, additionally contributes to hippocampal function has not been addressed so far.

In IL-1 α/β knock-out (KO) mice, more neural precursor cells are present in the subgranular zone of the dentate gyrus. This effect is accompanied by an increase in proliferation, whereas neuronal differentiation is unaffected. Interestingly, numbers of surviving immature neurons integrating eventually into the hippocampal circuitry are similar to control animals indicating an antagonizing mechanism. In the Morris water maze task, IL-1 α/β KO mice display deficits in spatial learning in the first acquisition phase, but show similar performance as control mice after translocation of the platform. Qualitative analysis of applied search strategies reveals no difference between IL-1 α/β KO and control mice, further supporting the observation the mice deficient for IL-1 signaling have no defects in task aspects specifically linked to new-born neurons. Thus, there seem to be multiple, independent roles of IL-1 in the hippocampus. On the one hand, it modulates adult hippocampal neurogenesis by suppressing progenitor cell proliferation, but also possibly by supporting neuronal cell survival. On the other hand, it seems to be important for proper spatial memory formation.

Host: Group Leader Duda Kvitsiani, DANDRITE