DANDRITE
Danish Research Institute of Translational Neuroscience
Nordic EMBL Partnership for Molecular Medicine

AARHUS UNIVERSITY

DANDRITE Topical Seminar

Monday 25th of November 2016

at 13.45 – 15.15

The Biomedicine Auditorium, building 1170, 3rd floor, room 347
Ole Worms Allé, 8000 Aarhus C

Tomonori Takeuchi

Postdoctorial Associate

Richard Morris Lab

Center for Cognitive & Neural Systems

University of Edingburgh

Dopamine-dependent memory consolidation and locus coeruleus

The retention of episodic-like memory is enhanced when something novel happens shortly before or after encoding. Using an everyday memory task in mice, we sought the neurons mediating this dopamine-dependent novelty effect, previously thought to originate from the tyrosine hydroxylase-expressing (TH^+) neurons in the ventral tegmental area (VTA). We find that neuronal firing in the locus coeruleus (LC) is especially sensitive to environmental novelty, LC-TH^+ neurons project more profusely than VTA-TH^+ neurons to the hippocampus, optogenetic activation of LC-TH^+neurons mimics the novelty effect, and this novelty-associated memory enhancement is unaffected by VTA inactivation. Surprisingly, two effects of LC-TH^+ photoactivation are sensitive to hippocampal dopamine D_1/D_5 receptor blockade and resistant to adrenoceptor blockade – memory enhancement and long lasting potentiation of synaptic transmission in CA1 *ex vivo*. Thus, LC-TH^+ neurons, typically defined by noradrenergic signalling, can mediate post-encoding memory enhancement in a manner consistent with possible co-release of dopamine in hippocampus.

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