

OIST SEMINAR

Date: Monday, May 19, 2014

Time: 11:00 – 12:00

Venue: OIST Campus Lab 1, Meeting Room C015 (Level C)

Speaker: Dr. Noriko Yutsudo

Affiliation: Kobe Pharmaceutical University

Title: “*fosB*-null mice display impaired adult hippocampal neurogenesis and spontaneous epilepsy with depressive behavior”

Abstract:

Patients with epilepsy are at high risk for major depression relative to the general population, and both disorders are associated with changes in adult hippocampal neurogenesis, although the mechanisms underlying disease onset remain unknown. The expression of *fosB*, an immediate early gene encoding FosB and Δ FosB/ Δ 2 Δ FosB by alternative splicing and translation initiation, is known to be induced in neural progenitor cells within the subventricular zone of the lateral ventricles and subgranular zone of the hippocampus, following transient forebrain ischemia in the rat brain. Moreover, adenovirus-mediated expression of *fosB* gene products can promote neural stem cell proliferation. We recently found that *fosB*-null mice show increased depressive behavior, suggesting impaired neurogenesis in *fosB*-null mice. In the current study, we analyzed neurogenesis in the hippocampal dentate gyrus of *fosB*-null and *fosB*^{d/d} mice that express Δ FosB/ Δ 2 Δ FosB but not FosB, in comparison with wild-type mice, alongside neuropathology, behaviors, and gene expression profiles. *fosB*-null but not *fosB*^{d/d} mice displayed impaired neurogenesis in the adult hippocampus and spontaneous epilepsy. Microarray analysis revealed that genes related to neurogenesis, depression, and epilepsy were altered in the hippocampus of *fosB*-null mice. Thus, we conclude that the *fosB*-null mouse is the first animal model to provide a genetic and molecular basis for the comorbidity between depression and epilepsy with abnormal neurogenesis, all of which are caused by loss of a single gene, *fosB*.