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

AARHUS UNIVERSITY

# Joint MBG Focus talk & DANDRITE Topical Seminar

**Thursday 30 June 2016**
**10.15 – 11.00**

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


## Koh-ichi Nagata

Institute for Developmental Research
Departments of Molecular Neurobiology
Kasugai, Japan


## Comprehensive approach to understand pathophysiological role of genes causing neurodevelopmental disorders

While many different biological causes have been implicated in the etiologies of neurodevelopmental disorders such as autism-spectrum disorders and intellectual disability (ID), genetic factors are considered to be the most important. It is thus essential to clarify the physiological and pathophysiological significance of respective disease-related gene products in the brain development and diseases, respectively. To address this issue, we have established an analytical battery containing in utero electroporation-based ex vivo observations (cortical neuron migration, axon elongation, dendrite development, spine morphogenesis and live-imaging) and in vitro cell biological and biochemical analyses.

Here we focus on SIL1 and RBFOX1 gene abnormalities. SIL1 encodes an endoplasmic reticulum resident cochaperone, and is a causative gene for Marinesco-Sjogren syndrome, a rare autosomal recessive disorder with ID. RBFOX1 (aka A2BP1 or FOX1) encodes a neuron-specific splicing factor regulating neuronal splicing networks, and has recently been identified as a "hub" in the autism gene transcriptome network. By comprehensive analyses with the analytical battery, gene abnormalities of SIL1 and RBFOX1 were found to cause structural and functional defects in the cerebral cortex, and supposed to contribute to emergence of the clinical symptoms of neurodevelopmental disorders.

*The scientific study was carried out by Koh-ichi Nagata, Nanako Hamada, Hidenori Ito, and Hidenori Tabata*

**Host:** Ernst-Martin Füchtbauer, Dept. Molecular Biology and Genetics, Associate Investigator at DANDRITE, Aarhus University