



Department of Biotechnology  
Ministry of Science and Technology  
Government of India  
**DBT**



National Institute of  
Advanced Industrial Science  
and Technology  
**AIST**

# DBT - AIST International Laboratory for Advanced Biomedicine

## DAILAB

### Classroom for Advanced & Frontier Education CAFE

## DAILAB-CAFE

#### Series - 08

Date and Time – March 26, 2015 (16:30~17:30)

Venue - Central 4 (5F) Room 5105

Speaker – Masakazu Namihira

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#### **Title - The role of DNA Methylation and Methyltransferases in Mammalian Brain Development**

DNA methylation is a key epigenetic factor influencing development, cell differentiation and genomic reprogramming. In mammals, DNA methylation patterns are established and maintained by DNA methyltransferases, DNMT1, -3A, and -3B, which are essential for the development of the central nervous system (CNS). During CNS development, neurons and glial cells (astrocytes and oligodendrocytes) are generated from multipotent neural precursor cells (NPCs) in a temporal manner, i.e. neurons are first generated at mid-gestation, followed by astrocyte at late-gestation. We reported that the maintenance methyltransferase DNMT1, which is highly expressed in NPCs at all stage of CNS development, plays an essential role in the suppression of astrocytogenesis via DNA methylation of astrocytic gene promoters at mid-gestation. Moreover, by using conditional Dnmt1 mutant mice, we demonstrated that DNA methylation, through its role in modulating neuronal gene expression, plays multiple roles in regulating cell survival and neuronal maturation in the CNS. In this seminar, I would like to talk about the role of DNA methylation in CNS development based on our findings.