

【演者】

Noriko Osumi

Tohoku University Graduate School of Medicine, Department of Developmental Neuroscience

【演題】

Effect of paternal aging on behavior of offspring in animal models of neurodevelopmental diseases

【講演要旨】

Recent studies suggested that advanced paternal age could be a risk for some psychiatric diseases like autism and schizophrenia, and thus how paternal aging affects their offspring's health is becoming a fundamental issue. In this study, we established a model to examine the biological basis for how paternal aging affects specific traits in their offspring. First, we confirmed behavioral abnormalities in offspring derived from old male mice. Because several literatures have indicated age-associated DNA methylation changes in sperm as a possible risk for the health problem in offspring, comprehensive targeted DNA methylome analysis was carried out using young and old mice sperm. We found in old sperm 16 hypermethylated and 96 hypomethylated genome loci, in which REST-binding domain was enriched. This is of interest because REST can repress various genes related with autism and schizophrenia. These findings suggest a possibility that age-associated DNA methylation changes may cause deterioration of transcriptional regulation of target genes/loci during brain development. The offspring showed defects in isolation induced vocal communication, spatial learning, and sensorimotor gating function, but their social communication and repetitive behavior were comparable to those derived from young male mice in our behavior paradigms. We are now challenging to elucidate how DMRs in old sperm actually affect gene expression within the offspring's brain during development.