S60-7 Molecular mechanisms regulating differentiation of primordial germ cells from pluripotential stem cells

◯Yasuhisa MATSUI[1], Ikuma MAEDA[1], Daimio OKAMURA[1]

[1]Institute of Development, Aging and Cancer, Tohoku University

Mammalian germ cells are induced form pluripotential stem cells at the early stage of embryogenesis, and we are interested in molecular cascades regulating the fate determination of mouse germ cells. To challenge this issue, we are attempting to identify key genes involved in germ cell formation by two different approaches. We have first tried to isolate genes whose expression was induced at the time of the fate determination in forming germ cells by differential hybridaization screening, and among candidate genes, we identified a gene encoding a transcriptional factor, REST. REST is known to be involved in neural development, but we found that number of primordial germ cells (PGCs) in early embryos was significantly reduced in REST deficient mice. We are examining the mutant mice in detail to understand how REST regulates PGC development. We also perform a functional screening of genes that are involved in induction of PGCs from ES cells by transfecting an siRNA library in culture, and we have found that the expression of several germ cell-specific markers are markedly induced after repressing functions of some particular genes by siRNAs. We are currently examining whether the induced PGC-like cells can actually differentiate into sperm. By those experiments, we try to understand details of key molecular mechanisms for mammalian germ cells formation.