IDENTIFICATION AND STUDY OF GENES IMPORTANT FOR FETAL GERM CELL BIOLOGY IN MICE

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We are using a multi-pronged approach to discovering genes and proteins that regulate the allocation, proliferation, migration, differentiation and apoptosis of primordial germ cells (PGCs) in the developing mouse embryo. First, we are using suppression PCR and microarray screening methods to identify genes whose expression is restricted to, or enriched in, gonads of a specific sex or developmental stage. In this way several genes were identified whose expression is restricted to germ cells. Second, we are using a proteomic approach to identify important proteins and the genes that encode them. Protein expression profiles are being compared between different sexes and stages of mouse fetal gonad development. Data so far indicate that this method is a useful adjunct to transcriptional profiling, capable of identifying not only proteins that are differentially expressed, but also those that are differentially modified, for example by phosphorylation. Third, *in silico* screening of mouse EST databases identified 23 new candidate genes whose expression appears to be limited to pluripotent cells and the germline. Many of these genes are novel uncharacterised transcripts. Preliminary *in situ* expression analyses show that eight of these genes are indeed limited to the germline and to pluripotent cells. These genes may have important functions in germline specification and function. We are currently developing approaches, including inducible RNAi-based methods, for examining the function of these genes, initially *in vitro* but also ultimately *in vivo*.

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