部門公開セミナー

共催：新学術領域研究「配偶子幹細胞制御機構」

Spermatogenesis – novel proteins and structures

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山手 3 号館 2 階共通セミナー室

For over a decade, our laboratory has been using knockout and knockin transgenic mouse studies to define TGF-beta superfamily signaling pathways, study ovarian and testicular cancers, and understand the functions of germ cell-expressed genes. To understand reproduction and cancer *in vivo*, we have produced over 50 transgenic knockout models including mice lacking TGF-beta superfamily ligands [e.g., growth differentiation factor 9 (GDF9), bone morphogenetic protein 15 (BMP15), activins, and inhibins]. To isolate novel gonad-expressed genes, we have used multiple strategies including proteomics, degenerate PCR, cDNA sequencing, *in silico* (electronic database) subtraction, PCR-based subtraction, genome database mining, and GeneChip technology. In the process of these studies, we have identified over 20 novel and gonad-expressed genes. Because fertility cannot be evaluated in a test tube, we have generated knockout models to define the *in vivo* functions of many of these novel genes. Our studies have identified genes that play key roles in the ovary (*e.g.*, GDF9, BMP15, and pentraxin), in the testis (*e.g.*, Tex14 and Klhl10), as maternal effect genes (*e.g.*, zygote arrest 1 and nucleoplasmin 2), or as tumor suppressors (*e.g.*, inhibins). These functional genomics approaches are helping to define mechanisms of reproductive function and will continue to aid in the identification of candidate genes that are potential contraceptive targets and/or mutated in men and women with infertility or cancer.

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